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THE

POPULAR ENCYCLOPEDIA;

OR,

"CONVERSATIONS LEXICON:"

BEING A GENERAL DICTIONARY OF

ARTS, SCIENCES, LITERATURE, BIOGRAPHY, HISTORY,
ETHICS, AND POLITICAL ECONOMY.

WITH DISSERTATIONS

ON THE RISE AND PROGRESS OF LITERATURE,
BY SIR D. K. SANDFORD, A.M., OXON., D.C.L.

ON THE PROGRESS OF SCIENCE,
BY THOMAS THOMSON, M.D., F.R.S.L. & E., &c., &c.

AND

ON THE PROGRESS OF THE FINE ARTS,
BY ALLAN CUNNINGHAM, ESQ.

VOLUME V.

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THE
POPULAR ENCYCLOPEDIA;
OR,
CONVERSATIONS LEXICON.

MISSOLONGHI, or MISSOLUNGHI; till 1826 the principal stronghold of the Greeks in Western Greece (in the ancient Ætolia). Surrounded by morasses, Missolonghi is situated on an alluvial tongue of land, in a shallow bay, west of the entrance of the gulf of Patras and of the outlet of the Evenus (now the *Fidaris*), and east of the mouth of the Achelous (now *Aspropotamo*), and was the bulwark of Western Greece in the late struggle with Turkey. The dikes formed by the alluvion, secure the lower parts of the place against inundations, and the lagoons and shallows protect the city against an attack by sea. Missolonghi, also called by the Greeks *Little Venice*, was, originally, a fishing village, with about 300 inhabitants. At the entrance to the fishing stations lies the island of Anatolico, likewise fortified. Both places can be approached only by fishing boats; the roadsteads for larger vessels are four or five miles distant. Previous to 1804 Missolonghi, which was protected from the pestilential atmosphere of the marshes and lagoons by a north wind that blows every afternoon, contained about 4000 inhabitants (among whom were rich merchants and shipmasters), most of whom left the place on account of the war. It was then governed chiefly by its own laws, merely paying to the pacha of Negropont the customary poll tax. In 1804, it fell under the dominion of Ali Pacha. Missolonghi and Anatolico raised the banner of the cross June 7, 1821, when the Hydriot fleet appeared in their waters. After the bloody campaign of 1822, in Acarnania, the commander-in-chief, prince Mavrocordato, threw himself (Nov. 5th), with 380 men and twenty-two Suliots, under Marco Botzaris, into Missolonghi, which was then untenable and almost deserted, and defended it, with but little artillery and ammunition, against Omer Vrione, pacha of Janina, and Rutshuk Pacha, till on the 23d Nov., it was relieved and reinforced by sea. Mavrocordato afterwards repulsed several assaults, and compelled the Turks to raise the siege January 6, 1823. Missolonghi, with Anatolico, was then fortified under the superintendence of British officers, partly at the expense of Murray, an Englishman, so that it was rendered one of the strongest places of Greece. Missolonghi sustained a second siege of fifty-nine days, in September, October, and December, 1823, when Mustai, pacha of Scutari, with Omer Vrione, invested it by land, and several Algerine vessels by sea. It was defended by Constantine Botzaris, brother of the hero of Carpinitzi. Mavrocordato hastened to its relief, with Hydriot vessels, and the plague desolated the camp of the barbarians. Mustai, in his hasty retreat, lost his artillery and his army. Mavrocordato now remained master of the place, and directed affairs in Western Hellas. There was also in Missolonghi a school of ancient Greek. Missolonghi was also the death-place of lord Byron, who arrived at the end of January, 1824, and died, April 19th of the same year. Mavrocordato was called to Nauplia, and in 1825, deprived of his office by the party of Colocotroni. The seraskier Redshid Pacha now appeared before Missolonghi, with 35,000 men. The brave Noto Botzaris (uncle of Marco) defended the place successfully, and the assaults of the seraskier, aided by the fleet of the capudan pacha, after the walls had suffered from a bombardment of forty days, were repulsed in the beginning of August, 1825. Ibrahim Pacha, with the Egyptian army, then joined in the siege. But all assaults were baffled: continued bombardments at length reduced the place to a heap of ruins, and the heroic garrison determined to force a passage through the besiegers. This was attempted at about eight o'clock in the evening of April 22, 1826, while the sick, aged, and wounded, with many women, remained behind in a large mill, which contained a quantity of powder, and which they prepared to blow up as soon as it was entered by the Turks. An old wounded soldier took his seat on a mine, and fired it as soon as they entered the town. About 1800, under the command of Noto Botzaris and Kitros Travellas reached Salona, and afterwards fought at Athens.—See Fabre's *Hist. du Siège de Missolunghi* (Paris, 1826).

MISSOURI; a very large river in the United States, which unites with the Mississippi a little below latitude 39°. It rises in the Rocky mountains, and takes the name *Missouri* in latitude 45° 10′ N. and longitude 110° W., where the three branches, Jefferson, Gallatin, and Madison, unite. The spring sources of the Missouri, and those of the Columbia which flows west to the Pacific, are within a mile of each other. The three head branches of the Missouri are navigable for a considerable distance before their junction. Where the river makes its escape from the Rocky mountains, it presents a scene of remarkable sublimity. For a distance of nearly six miles, the rocks rise perpendicularly from the water's edge 1200 feet. The river is compressed to the width of 150 yards, where it rushes through these gates of the Rocky mountains. About 110 miles from this chasm, are the stupendous cataracts of the Missouri. The greatest cascade is eighty-seven feet perpendicular, and the next is forty-seven. Within a space of eighteen miles, the river descends 357 feet. These falls are almost the only obstruction to the navigation of the river, even to its head branches, 251 miles above the falls. These distances are given from Lewis and Clarke; and, according to their estimates, the whole length of the Missouri, above its junction with the Mississippi, is more than 3100 miles. Add to this the distance from the mouth of the Missouri to the gulf of Mexico, and the sum will be nearly 4400 miles. We have no means, at present, of giving a more probable estimate. The number of large rivers which flow into the Missouri is so great, that we can enumerate only a small part of them. Yellow Stone, Platte, Osage, and Kansas, are noticed separately. The Chienne is considered navigable by boats 800 miles; White river, 600; and several others are broad, deep streams, navigable for more than a hundred miles. Through most of its course, the Missouri is very rapid and turbid. The alluvial tract on its banks is narrower than that of the Mississippi. There are many settlements on the banks for 400 miles from its mouth, and a few are found more than twice that distance. Beyond the state of Missouri, the river and its branches have generally but narrow margins of fertile land. In many places, the prairies come even to their banks; and emigrants pass onward, and leave such unpromising lands for future generations. The Missouri is much longer than the Mississippi before their junction, and has a much greater volume of water. It is about half a mile wide at its mouth, but is wider for a great part of its course.

MISSOURI, one of the United States of America, is situated between 36° and 40° 30′ N. latitude, and between 88° 17′ and 94° 30′ W. longitude. Its length is 270 miles, and its breadth 220, and it contains 38 million acres; bounded north and west by Missouri Territory; east and north-east by the Mississippi, which separates it from Illinois; south-east by the Mississippi, which separates it from Kentucky and Tennessee; south by Arkansas Territory. Population in 1820, 66,586, of whom 10,222 were slaves. Persons engaged in agriculture, 13,559; in manufactures, 1887; in commerce, 480. Population in 1830, 140,074, of whom 24,990 were slaves. The south-east part of the state has a very extensive tract of low marshy country, abounding in lakes, and liable to inundation. Back of this there is a region of hilly and mountainous country, extending to the Osage. The best land in the state is north of the Missouri. This part contains large tracts of alluvial and hilly prairies, and is nowhere mountainous. The soil here is excellent. It is less clayey and stiff than that of Ohio and Kentucky. There is also an immense prairie commencing in the western part of the state, and extending far into the Missouri Territory. The soil of the upland prairies is far inferior to that of the alluvial prairies. The staple productions have been wheat and Indian corn, during the short period that any part of Missouri has been cultivated. Its soil will also produce the other kinds of grain in perfection, and also the various fruits which grow in the states having the same latitude. Tobacco thrives well, and cotton yields a tolerable crop. Flax and hemp are likely to become largely cultivated. Indeed, many parts of this extensive state are likely to rival the best tracts east of the Mississippi in the abundance of their productions. The prairies, being entirely destitute of trees and shrubs, are ready for the plough; and there are such extensive tracts of this land in this state, which are admirably suited to the growth of wheat, that many nations might here be supplied. In the spring, every prairie is a perfect flower garden, exceeding other gardens in extent scarcely more than in the variety and beauty of its flowers. Many of the species are seen through summer and autumn. The climate is extremely fickle and variable, and the changes of temperature are very great. The prevailing winds follow the direction of the Mississippi Valley; those from the northward are cold, and the southern are warm. Winter commences in its severity about Christmas, and is frequently so severe, that the Missouri is passable on the ice with loaded teams, for many weeks. The summers are very warm. Less rain falls here than in New-England or the Southern States; and the atmosphere is much drier. Of the minerals and fossils already discovered, the principal are lead, coal, plaster, iron, manganese, zinc, antimony, cobalt, various kinds of ochre, common salt, nitre, plumbago, porphyry, jasper, chalcedony, and marble. Lead ore is dug in various parts of the state, but there is a district extending nearly a hundred miles in length, and forty in width, which is particularly distinguished for its lead mines. The centre of the part which has been most explored, is about seventy miles south-west from St Louis, and about half as far from Herculaneum on the Mississippi. The French dug lead from these mines 100 years ago. Somewhat more than 3,000,000 pounds are annually smelted, giving employment to about 1200 workmen. Shot-towers are erected at Herculaneum and other places, and great quantities of shot are exported. The mine country is remarkable for its salubrity, the fertility of its soil, and its beautiful streams. There is doubtless ore enough, of excellent quality, to supply the whole world with lead. The great river Missouri traverses this state. The Osage is its principal southern branch, and will be described separately. Several considerable rivers unite their waters with the Missouri on the northern side, and others with the Mississippi. The Maramec runs through the mineral district, and enters the Mississippi eighteen miles below St Louis. It is between 200 and 300 yards wide, and navigable by boats at some seasons 200 miles. Many of the small rivers are dry a part of the summer. St Louis is the commercial capital, and is the largest town of the United States west of the Mississippi. St Genevieve, about one hundred miles west of the Mississippi, and sixty-four below St Louis, is settled principally by French. It has about 1500 inhabitants, and considerable trade in lead. Jackson, the county town of Cape Girardeau county, is a thriving village. Potosi, in the mining district, is a considerable town. Herculaneum is the principal place of deposit for the lead from the mines. New Madrid is, next to Natchez, the most noted landing place for boats on the Mississippi. It suffered greatly from an earthquake in 1811. St Charles, about twenty miles above St Louis, contains about 1200 inhabitants. Jefferson, a new town at the mouth of the Osage, is the present seat of government. Franklin, 150 miles by land above St Louis, is a considerable village. The most numerous denominations of Christians in Missouri, are Methodists, Presbyterians, and Catholics. Religious instruction and good schools are less esteemed and less common in this new state than in most others in the Union. St Louis college, a Catholic institution, was founded in 1829. The college building is a brick edifice, fifty feet by forty; but this is not sufficiently commodious, and preparations have been made for enlarging it. It is situated very pleasantly in the neighbourhood of the city. It has a president, six professors, and 125 students. Two other professors are about to be added. The library contains 1200 volumes. This institution is likely to become very useful to the state. Corporations have been formed for nine academies. St Louis was founded in 1764; the principal inhabitants were from Canada. This country was settled but slowly until it was purchased by the United States; since that period, immigration has almost annually increased. In 1820, Missouri became an independent state, and it will, doubtless, become one of the most populous in the Union. For the constitution, see *Constitutions of the United States*. A good description of Missouri, and of all the states of the Mississippi Valley, may be obtained from Flint's Geography, &c.

MISSOURI TERRITORY; a tract of country belonging to the United States, 900 miles long, and 800 broad; bounded by the British possessions on the north; the North-West Territory, Illinois and Missouri on the east; the territories of the Mexican republic on the south and south-west; and west by the Rocky mountains. The belt of land on the west border of the Mississippi, that is wooded, is generally from two to four hundred miles broad. Then commence the immense prairies, which constitute so striking and impressive a feature in the vast country that spreads westward to the Rocky mountains. For the most part, this country is a plain, more or less covered with grass, and in many places, fertile; but other parts, of great extent, are almost a moving sand. Countless numbers of buffaloes, elks, and other wild animals, graze upon it. The principal sources of the Missouri, Arkansas, and Red river, are found in this territory, and several large branches of the Mississippi, above the Missouri, come from the north-western part of the same vast country. The Rocky mountains are yet but imperfectly known. Their bases have generally an elevation of 3 or 4000 feet above the ocean, and some of them are estimated at 12,000 feet in height. Following up the valleys of the sources of the Platte to the opposite valleys of waters that flow west, a good road is found, easily passable with loaded wagons. Thus an easy communication is provided between the navigable rivers of the Oregon territory, on the borders of the Pacific ocean, and those which flow into the gulf of Mexico. There are other ranges of mountains, which traverse different parts of this territory, as the Black hills, the Ozark mountains, the Masserne, &c. There are fertile belts of land on the margins of most of the rivers, and some of them have a great extent of rich country. Generally, as we recede from the rivers, the soil becomes poor, and very extensive deserts are found in the southern regions. There are very few settlements of whites in this vast country, and none so considerable as to have any established government. At Council Bluffs there is a military post, having one regiment of infantry. Many tribes of Indians still possess extensive tracts. The Sioux are the most numerous; the whole number is estimated at between 140,000 and 150,000.

MISTLETOE. See *Misletoe*.

MITE. Several minute species of insects are known under the name of *mites*, most of which, however, belong to the genus *acarus* of Linnæus. The most of these animals are very small, or almost microscopic. They occur everywhere, some being of a wandering character and to be found under stones, leaves, the bark of trees, or in provisions, as meal, cheese, pepper, &c.; others are stationary and parasitic, on the skin of various animals, sometimes proving of serious injury to them. It is even asserted, and with great appearance of truth, that the itch is owing to these animals. From the experiments of several inquirers, it appears they not only have been seen in the pustules of the itch, but also that they are capable of giving it to a healthy individual by being placed on his skin. This is, however, denied by other and very high authority. The mites inhabiting cheese are so minute that to the naked eye they appear like moving particles of dust. They are very quick-sighted, and when once they have been touched with a pin, it is curious to observe the cunning which they display to avoid a second touch. They are extremely voracious, and will even prey on each other, and are so tenacious of life that they have been kept alive for many months between object-glasses of a microscope. The species which is found in meal occasions considerable injury. Leuwenhoek states that they may be expelled by placing a few nutmegs in the vessel or sack containing the meal. A German writer, named Funke, advises a cheaper remedy, which consists of the decorticated, thick branches of the lilac, or elder, which are to be put in the flour, and will, it is said, completely prevent their depredations. See *Tick*.

MITE; a small coin, formerly current, equal to about one third of a farthing; it also denotes a small weight used by the moneyers. It is equal to the twentieth part of a grain, and divided into twenty-four doits.

MITFORD, William; an eminent historical and philological writer, born in London, February 10, 1734. He studied at Queen's college, Oxford, and then at the Middle Temple, but early quitted the profession of the law, and obtained a commission in the Southamptonshire militia, of which he became colonel. In 1785, he was chosen member of parliament, in which he sat till 1818. His death took place in 1827. He was professor of ancient history at the royal academy; and, besides his principal work, the History of Greece (1784—1810, 4 vols., 4to; since reprinted in 8vo), he published an Essay on the Harmony of Language (1774, 8vo); a Treatise on the Military Force, and particularly the Militia of this kingdom (8vo); Observations on the History of Christianity (8vo); a work on architecture, and another on the corn-laws.

MITHRA; the sun, or the genius of the sun, with the Persians, which was worshipped as a deity, at a later period, also in Greece and Rome. Mithra stands as a mediator between Ormuzd and the world. His symbols are the sun (of truth and justice) on his head, the mace (power) in his hand, or the sacrificing dagger, and the bull of the world, on whose back he lies. He is not to be confounded with the Mitra, or Anahid, the Persian Venus. Even in Germany, there are traces of his worship, in the provinces anciently under the dominion of the Romans

MITHRIDATES; the name of several kings of Pontus, among whom Mithridates the Great, or the VIth, was the most renowned. Ambition, cruelty, a spirit which nothing could bend, united with a powerful genius, were the characteristics which early developed themselves in his character. His father was murdered B. C. 124, and Mithridates ascended the throne at the age of thirteen years. His mother and instructor plotted against his life; but he caused the former to be thrown into prison (although she had been made co-regent with him), where she died, according to some, of ill treatment, but according to others of poison. He hardened his body against exposure, and endeavoured to render himself insensible to the effects of poison (whence the name of a supposed antidote, *Mithridate*). When he became of age, he travelled through Asia, partly to learn the customs, laws, manners, and languages of the inhabitants (and he is said to have spoken twenty-two languages), and partly to examine the territories of his neighbours, of which he meditated the conquest. After an absence of three years, he returned, and put to death his wife, who had been unfaithful, and had attempted to poison him. He then attacked Paphlagonia, and divided it with his ally, the king of Bithynia. The Romans, who had declared the country free, threatened him with a war; but Mithridates was so little alarmed at this threat, that he even possessed himself of Galatia, which had placed itself under the protection of Rome. He next directed his attention to Cappadocia; but, fearing the power of Ariarathes, who was in possession of this country, and his connexion with the Romans, he had recourse to treachery, and caused him to be assassinated. At the same time, Nicomedes, king of Bithynia, entered Cappadocia, drove out the son of the murdered king, and married Laodice, the widow of Ariarathes and the sister of Mithridates. The latter then took the opportunity of re-entering Cappadocia, conquered it, and replaced his nephew on the throne; but he soon compelled the young prince, by his dishonourable requisitions, to a declaration of war. They marched against each other, with about equal forces. Mithridates then offered terms of peace, and invited the young prince to a conference, in which he killed him with a dagger, in the sight of both armies. The Cappadocians, seeing their master fall, were seized with terror, and Mithridates possessed himself of the country, almost without opposition. Nicomedes now concerted with his wife the plan of suborning a young man to represent the third son of Ariarathes, and caused him to send to Rome to implore assistance. Laodice herself performed a journey to Rome, in order to confirm his story. Mithridates took advantage of this fraud to endeavour to prove to the Romans that the young prince to whom he had given up Cappadocia (who was his own son, to whom he had given the name of Ariarathes) was the real son of Ariarathes. The Romans, having discovered this double fraud, took Cappadocia from Mithridates, and Paphlagonia from Nicomedes; and the Cappadocians elected Ariobarzanes their king. Scarcely had Sylla, whose arms had elevated the latter to the throne, left Asia, when Mithridates, with the assistance of Tigranes, king of Armenia, replaced his son upon the Cappadocian throne. He also, at the same time, took Bithynia, and gave that country to his brother Socrates Christos. The Romans, however, soon restored things to their former condition. Mithridates then declared himself against the Romans, and, because they would not acquiesce in his demands, he suddenly fell upon Cappadocia and Bithynia at the same time. His forces amounted to 250,000 foot, 50,000 horse, 130 chariots armed with scythes, and 400 ships. Those of the Romans, with the Bithynian auxiliaries, were not much inferior, and were commanded by Cassius, Aquilius, and Oppius. Mithridates was successful at the opening of the war. He not only defeated Nicomedes, but also Aquilius, conquered Bithynia, and captured a great part of the Roman fleet. Phrygia, Caria, Mysia, Lycia, Pamphylia, Paphlagonia, and all the country as far as Ionia, fell into his hands, and hailed him as the saviour of Asia. The Roman generals Oppius and Aquilius were also given up to him as prisoners by the inhabitants of Laodicea and Lesbos; and he caused melted gold to be poured down the throat of the latter, in derision of the avarice of the Romans. The free cities of Asia, Magnesia, Mitylene, Ephesus, &c., opened their gates to the victor, who collected treasure sufficient to maintain his army five years. He caused all the Roman citizens in Asia Minor, with their wives and children, to be put to death. Dionysius and Plutarch give the number of those who perished at 150,000; Appian at 80,000. Mithridates next conquered the islands of the Ægean sea. Rhodes, however, held out so firmly that he returned to Pergamus. From hence he sent his general Archelaus, with 120,000 men, to Greece. Athens fell by treachery into his hands, and various other places were taken, while another of his generals, Metrophanes, ravaged Eubœa. On the news of the defeat of the latter, Mithridates sent his son Ariarathes, with a powerful army, into Macedonia, which, with Thrace, was speedily conquered. His arms were everywhere victorious, until, at length, the report that he threatened Italy itself, led the Romans to adopt more decisive measures. Sylla embarked for Greece, reduced Athens by famine, destroyed the army of Archelaus in a bloody contest at Chæronea, and emancipated all Greece by two victories in Bœotia. Fimbria, with no less success, reduced Asia Minor, and besieged Mithridates himself in the fortress of Pitane, who finally fled to his ships. The Pontic fleet was also twice defeated by Lucullus. Thus pressed on every side, Mithridates commissioned Archelaus to conclude a treaty, which Sylla granted, under severe conditions, B. C. 89. Mithridates was limited to his hereditary kingdom of Pontus, and compelled to deliver into the hands of the Romans eighty ships of war manned, and to pay 2000 talents. Sylla had scarcely left Asia before Mithridates attacked Colchis, and refused to fulfil the conditions of the peace. The Roman general, Murena, who entered and ravaged Pontus, was defeated, and many cities of Asia had declared themselves for the victor, when Aulus Gabinius, sent by the dictator Sylla, appeared. Cappadocia was evacuated by Mithridates; but, on the other hand, he subdued the Bosphorians (B. C. 82), and had no sooner heard of the death of Sylla (B. C. 78), than he determined to recover the countries he had ceded, and, in order to distract the Romans, entered into a treaty with Sertorius, the chief of the Marian faction in Spain. His son-in-law Tigranes, king of Armenia, entered into his designs, and marched to Cappadocia, while Mithridates himself, after the subjugation of Paphlagonia, conquered Bithynia and the provinces of Asia. A new war with Rome was now unavoidable. The consuls Lucullus and Cotta went against Mithridates, the latter as commander of the fleet, and the former as general of the land forces. Cotta was unsuccessful; Lucullus, on the contrary, cautiously avoided a general engagement with the superior forces of the enemy, but at the same time gained so many important advantages, by sea and land, that he soon entered Pontus as a conqueror. While he was besieging Amisus, Mithridates collected an army, and gained a decided victory; yet Lucullus succeeded in regaining what he had lost, and Mithridates found himself compelled, by the revolt of his own troops, to fly to Tigranes, in Armenia, who received him, but did not make common cause with him. Lucullus, who had, in the mean time, transformed Pontus into a Roman province, demanded the surrender of Mithridates, which Tigranes refused, because, as he said, although he disapproved the conduct of Mithridates, he nevertheless esteemed it dishonourable to deliver up so near a connexion to his enemies; but, as he foresaw that the Romans would not be contented with this answer, he agreed with Mithridates that he should return to Pontus with 10,000 men, collect an army, and return with it before Lucullus, who was besieging Sinope, should come into Armenia. Sinope, however, surrendered sooner than they expected, and Lucullus defeated Tigranes before his junction with Mithridates. Tigranes, nevertheless, collected a new army, which Mithridates led into Pontus. Lucullus, however, checked his progress by a victory; but, during the winter, Mithridates strengthened his forces, and soon entirely defeated the lieutenants of Lucullus, and then directed his march towards Armenia Minor, to form a junction with Tigranes. In the mean time, the consul Manius Acilius Glabrio had taken the chief command, in the place of Lucullus. The allied kings took advantage of the confusion incidental to this change, and reconquered the greatest part of Pontus, Bithynia, Cappadocia, and Armenia Minor. Pompey then appeared at the head of the Roman army. After he had in vain offered him peace, and sought a decisive battle, he besieged Mithridates in his camp, not far from the Euphrates. The king thence retreated, but was pursued, attacked in a defile, and totally routed at Nicopolis (B. C. 66); he escaped with only 800 horse. Tigranes would not receive him, and he fled to Colchis. Pompey followed him, and he took refuge in the dominions of a Scythian prince. He was now thought to be dead, until he suddenly reappeared in Pontus, collected troops, and, at the same time, offered terms of peace to Pompey; they could not, however, agree, and the war broke out afresh. The force of the Romans in Pontus was small, and Mithridates made some progress. The inhabitants, however, soon revolted from him, and his neighbours refused him their assistance; nevertheless, his unbending spirit rejected the proposals of peace made by Pompey. He put to death his son Machares, made himself king in Bosphorus, and formed the bold project of penetrating into Gaul (where he had sent ambassadors) at the head of his army, and marching, with the inhabitants, into Italy; but, having encamped at the Cimmerian Bosphorus, an insurrection broke out in his army, at the head of which was his son Pharnazes. Unable to reduce the rebels to their duty, and having taken poison without effect, Mithridates threw himself upon his sword, that he might not fall alive into the hands of the Romans (B. C. 64.) This celebrated monarch ruled Pontus fifty-nine years.

MITHRIDATES; the title given to the *Allgemeine Sprachenkunde* of Adelung and Vater, in which the Lord's prayer is exhibited in nearly five hundred languages and dialects. See *Vater*.

MITRA; a head-dress of the ancient Persian kings. See *Infula*.

Mitra; the ancient Persian goddess of love.

MITRE (Greek *μιτρα*), in costume; a sacerdotal ornament, worn on the head by bishops and certain abbots on solemn occasions, being a sort of cap, pointed and cleft at top. The high priest among the Jews wore a mitre, or bonnet, on his head. The inferior priests of that nation had likewise their mitres, but in what particulars they differed from that worn by the high priest, is not now certain. Some writers contend that the earlier bishops wore mitres; but this circumstance is also enveloped in a good deal of doubt. Among the primitive followers of Christianity, there was a class of young women who professed a state of virginity, and were solemnly consecrated thereto. These wore a purple and golden mitre, as a badge of distinction. His holiness the pope uses four different mitres, which are more or less rich, adorned according to the nature of the festivals on which they are assumed. The cardinals formerly wore mitres, and some canons of cathedrals in Roman Catholic countries have the privilege of wearing the mitre, which is also borne by several families of distinction in Germany as their crest. But we must look back into remoter ages, in order to find the origin of the use of the mitre. It would seem to have obtained primarily in India. According to several authors, it was first a part of female costume, and when worn by a man was considered as indicative of effeminacy. The fillet, with which Bacchus is often represented as having his head bound, has been denominated *mitrephora*. A peculiar kind of head-dress, covering the whole head, is often found depicted on ancient coins, &c., with pendents, or pointed dewlaps, by means of which, perhaps, this kind of mitre was tied under the chin. This was probably the Phrygian mitre; for we find Paris with this head-dress on a gem published by Natter, and subsequently by Winckelmann, in his *Monumenti Inediti* (No. 112). Priam, and the Amazons, upon the Homeric monuments, and the Parthian kings, upon several medals, have a similar mitre. The mitre is very frequently met with in early Christian manuscripts, in illuminated missals, and upon the oldest ecclesiastical monuments; this, however, might be expected, since its usage has always been principally ecclesiastical. A statue of St Peter, erected in the seventh century, bears this mark of distinction, in the shape of a round, high, and pyramidal mitre, such as those worn by each of the popes since. Perhaps this statue offers one of the earliest instances of its usage in the Christian churches. See *Infula*, and *Tiara*.

MITTAU (in Lettonian, *Jelgava*); a city of Russia; chief city of the government of Mittau (see *Courland*), lat. 56° 39′ N.; lon. 23° 43′ E. It is situated in a low and marshy country, about nine leagues from Riga. The population is 12,000, composed of Russians, Germans, Lettonians, and Jews. The old ramparts have been destroyed. It contains numerous charitable and literary institutions. The old castle, founded by the duke Ernest John, was occupied by Louis XVIII. for several years. Mittau, the ancient residence of the dukes of Courland, was captured by the Swedes in 1701, and recovered by the Russians in 1706.

MITTIMUS; a writ by which records are transferred from one court to another. The precept directed to a gaoler, under the hand and seal of a justice of the peace, for the receiving and safe keeping of a felon, or other offender, by him committed to gaol, is also called a *mittimus*.

MIZZEN; the aftermost or hindermost of the fixed sails of a ship.

MIZZEN MAST; the mast which supports all the after sails. See *Ship*.

MNEMONICS (from the Greek *μνημονευω*, to remember); the art of assisting the memory. In the article *Memory*, the liveliness with which ideas are often recalled by accidental associations, has been spoken of. This very naturally led men to attach ideas, words, &c., purposely, to certain things familiar to the mind, in order to be assisted by the latter in remembering the former. One kind of mnemonics, and perhaps the earliest, is to attach the idea to be remembered to some impression of the senses, such as the external objects which are most familiar to our eyes (*topology*, from *τοπος*, place): some persons make use of a picture, arbitrarily drawn, to which they attach the subjects to be remembered, in a certain order (*symbolics*, from *συμβολον*, mark); others make use of numbers. There are certain natural aids to the memory, which we all employ; for instance, if we put a piece of paper in a conspicuous spot of our room, or make a knot in a handkerchief, in order to be reminded of certain things at particular times. As to topology, an orator who intends to deliver a long speech without notes, may derive assistance from previously entering the room where he is to speak, and attaching in his mind to certain prominent objects in the room the chief heads of his speech. To remember dates, several methods have been devised. The one proposed in Gray's *Memoria Technica* is to make certain changes in the names of persons, places, &c., in such a way that the words shall signify also certain numbers, according to a plan previously adopted. A table must be drawn up, similar to the following:—

a	*e*	*i*	*o*	*u*	*au*	*oi*	*ei*	*ou*	*y*
1	2	3	4	5	6	7	8	9	0
b	*d*	*t*	*f*	*l*	*s*	*p*	*k*	*n*	*x*

If we now wish to impress in our memory that Julius

Cæsar arrived at the supreme power 46 B.C., we may change the *Julius* into *Julios*, which will be easily remembered whenever we think of *Julius*, and *os* signifies, according to the above plan, 46. If we wish to remember that Alexander the Great founded his empire 331 B. C., we change *Alexander* into *Alexita*, *ita* signifying 331, according to the above. In the same way *Cyrus*, changed into *Cyruts*, gives the year of the foundation of his great empire. This method may much facilitate the retaining of facts to a certain extent; but it would seem as if the changes themselves might become too numerous to be easily remembered.

Systems of mnemonics of a more *general* character have been proposed; few, however, or none, have remained in vogue for any length of time. Generally speaking, mnemonics ought to be individual; each individual ought to find out that method of assisting his memory which is most convenient to himself; and this will vary, of course, with his habitual associations. The only true basis of a philosophic memory, however, is just classification. (See *Memory*.) Considerable aid to the memory may be derived from the use of rhymes, or a rhythmical arrangement of words. Remote antiquity made use of rhythm to preserve the memory of historical facts before the invention of writing. The ancients were well acquainted with mnemonics; according to some, the science came from the east to the Greeks; others consider the poet Simonides as the inventor of them; but such inventions cannot be properly assigned to any particular individual. In the time of Cicero it was known among the Romans (see Cicero *De Oratore* ii. 86 et seq.; *Auct. ad Herenn.* iii. 16 seq.; Quinctil. x, 1, 11 seq. After Quinctilian's time, mnemonics again declined. In considering the use of mnemonics by the ancient orators, we should remember that they delivered long orations indeed, but had nothing like our debates, in which a member of a deliberative body sometimes rises, and speaks for hours in succession, recapitulating all which has been said before him on the question, and therefore, to a considerable degree, without premeditation. Most of the systems of mnemonics devised for the ancients, would be useless for a parliamentary orator of the present day. In the place of the ancient mnemonics, the schoolmen used the tabellary method. Conrad Celtes, in the fifteenth century, and Schenkel, in the sixteenth, re-established the ancient system. In modern times, several scholars have given much attention to this subject. Some of the best works are Kastner's *Mnemonik, oder die Gedächtnisskunst der Alten* (Leipsic, 1805); *Systematische Anleitung zur Theorie und Praxis der Mnemonik*, by Aretin (Sulzbach, 1810); Feinagle's New Art of Memory, to which is prefixed some Account of the Principal Systems of Artificial Memory (London, 1812); Gray's *Memoria Technica* (1730). The degree to which the power of memory has been sometimes carried, is almost incredible. Thus Seneca states, that, by the mere effort of his natural memory, he was able to repeat 2000 words upon once hearing them, each in its order, though they had no dependence or connexion on each other. He also mentions Cyneas, ambassador to the Romans from king Pyrrhus, who in one day so well learned the names of the people whom he saw, that the next day he saluted all the senators, and all of the populace assembled, each by his proper name. Pliny says that Cyrus knew every soldier in his army by name, and L. Scipio all the people of Rome. Charmipas, or rather Carneades, when required, it is said, would repeat any volume found in the libraries as readily as if he were reading. Doctor Wallis tells us, that, without the assistance of pen and ink, or any thing equivalent, he was able in the dark, by the mere force of memory, to perform arithmetical operations, as multiplication, division, extraction of roots, &c., to forty places. It is said of Magliabecchi, that a gentleman, having lent him a manuscript which he was going to print, came to him soon after it was returned, and, pretending that he had lost it, desired him to repeat as much of it as he could; on which Magliabecchi wrote down the whole, without missing a word or varying the spelling.

MNEMOSYNE (Greek, *Memory*), in the Grecian mythology; daughter of Uranus (*Cœlus*, Heaven), and Gaia (*Terra*, Earth), and by Jupiter the mother of the nine Muses. (q. v.)

Mo signifies *tribe*, *nation*, in many idioms of Southern Africa.

MOAB; the land of the Moabites, an Arabian tribe, dwelling in the mountainous region east of the Dead sea, from Zoar to the river Arnon, between the Midianites, Edomites, and Amorites. According to the Mosaic account (*Gen.* xix. 30), the Moabites were descended from Moab, the son of Lot by his eldest daughter. In the time of the judges, they were for eighteen years masters of the Hebrews, but in the time of David, were rendered tributaries to them. After the Babylonish captivity, they lost their separate national existence. Their principal leaders mentioned in scripture, are Balak and Eglon; their idols were Peor and Chemosh.

MOALLAKAT (i. e. *the hung up*); seven Arabian poems of the time immediately preceding Mohammed, which, on account of their excellence, were suspended in public, on the temple at Mecca. An English translation with arguments, and the Arabic text, was published by Sir W. Jones (London, 1783.) See *Arabian Literature*.

MOAT, or DITCH, in fortification, a deep trench dug round the rampart of a fortified place, to prevent surprises. The brink of the moat next the rampart, is called the *scarp*; and the opposite one, the *counterscarp*. A dry moat round a large place, with a strong garrison, is preferable to one full of water; because the passage may be disputed inch by inch, and the besiegers, when lodged in it, are continually exposed to the bombs, grenades, and other fire-works, which are thrown incessantly from the rampart into their works. In the middle of dry moats, there is sometimes another small one called *lunette*, which is generally dug till the water fills it. The deepest and broadest moats are accounted the best; but a deep one is preferable to a broad one; the ordinary breadth is about twenty fathoms, and the depth about sixteen. To drain a moat that is full of water, a trench is dug deeper than the level of the water, to let it run off, and then hurdles are thrown upon the mud and slime, covered with earth or bundles of rushes, to make a sure and firm passage.

MOBILE; a city, port of entry, and capital of Mobile county, Alabama, on the west side of Mobile river, at its entrance into the bay. It is thirty miles north of Mobile point, which is on the east side of the mouth of the bay; fifty-five miles west by north from Pensacola; and 160 east from New Orleans; lat. 30° 40′ N.; lon. 88° 21′ W. In 1813, this town came into the possession of the United States, and then contained about 300 inhabitants. In 1822, its population was estimated at 2800; and in 1830, it contained 3194.—Mobile is situated considerably above the overflow of the river, in a dry and pleasant place; but access to the city is rendered somewhat difficult by a swampy island opposite. It has, moreover, swampy lands and stagnant waters back of it; and near it is a sterile country of pine woods. The city has several times been ravaged by the yellow fever, and has once been almost wholly destroyed by fire. Advantage was taken of the sickliness of Mobile, a few years since, to establish the town of Blakely, on the eastern and opposite side of the bay, and ten miles distant from Mobile. Besides being healthy, this site has many very important advantages over Mobile; but the project of establishing it as a substitute for Mobile, entirely failed. Only New Orleans and Charleston are before Mobile in the cotton trade, and Charleston is declining, while Mobile is rapidly increasing. The value of exports of domestic produce from Alabama in 1829, was 1,679,385 dollars; and nearly the whole of this must have been shipped at Mobile. This city has a regular steam-boat communication with New Orleans through lake Ponchartrain. During most of the year, steam-boats are constantly plying between this place and the towns on the river, and many vessels are loading at the wharves for distant ports.

MOBILE; a river of Alabama, formed by the union of the Alabama and the Tombeckbee. It takes the name of *Mobile* where these two rivers unite at fort Mimms. It enters Mobile bay by two mouths. The Alabama is the eastern branch, and rises in the Alleghany ridges of Georgia. It receives a number of small streams, and becomes navigable for small sea vessels at fort Claiborne. Similar vessels ascend the Tombeckbee to the mouth of the Black Warrior, eighty miles above St Stephens. At moderate stages of water it affords steam-boat navigation to Tuscaloosa, 320 miles from Mobile. Both these rivers are very favourable to boat navigation. The lands on their borders are excellent, and produce great quantities of cotton.

MOBILITY; a contingent property of bodies, but most essential to their constitution. Every body at rest can be put in motion, and if no impediment intervenes, this change may be effected by the slightest external impression. Thus the largest cannon ball, suspended freely by a rod or chain from a lofty ceiling, is visibly agitated by the horizontal stroke of a swan shot which has gained some velocity in its descent through the arc of a pendulum. In like manner, a ship of any burden is, in calm weather and smooth water, gradually pulled along even by the exertions of a boy. A certain measure of force, indeed, is often required to commence or to maintain the motion; but this consideration is wholly extrinsic, and depends on the obstacles at first to be overcome, and on the resistance which is afterwards encountered. If the adhesion and intervention of other bodies were absolutely precluded, motion would be generated by the smallest pressure, and would continue with undiminished energy.

MOCHA, or MOKKA; a town on the Arabian sea, in the province of Yemen, with a commodious harbour, and about 6000 inhabitants, including several hundred Jews and about 500 Banians. It is frequented by merchants from the Barbary States, Egypt, Turkey, and India, and by British, French, and North American ships. The coffee which bears the name of the town, is brought down from the interior of the country by caravans. Gum Arabic, copal, mastich, myrrh, frankincense, indigo, senna, and other articles, are exported. The imports are chiefly Indian commodities. The trade is most active between May and August, in which period about 100 ships enter the port. There are several mosques, caravansaries, and European factories here. Lon. 43° 10′ E.; lat. 13° 16′ N.

MOCKING BIRD (*turdus polyglottos*). This capricious little mimic is of a cinereous colour; paler beneath. It inhabits America from New England to Brazil, but is rare and migratory in the Northern States, whilst it is common and resident in the Southern. This bird, although it cannot vie with most of the American species in brilliancy of plumage, is much sought for on account of its wonderful faculty of imitating the tone of every inhabitant of the woods, from the twitter of the humming-bird to the scream of the eagle. But its notes are not entirely imitative; its own song is bold, full, and exceedingly varied, during the utterance of which it appears in an ecstasy of delight. In confinement, it loses little of its power or energy. To use the words of Wilson, "He whistles for the dog; Cæsar starts up, wags his tail, and runs to meet his master. He squeaks out like a hurt chicken, and the hen hurries about, with hanging wings and bristled feathers, clucking, to protect her injured brood. The barking of the dog, the mewing of the cat, the creaking of the passing wheelbarrow, follow with great truth and rapidity. He repeats the tune taught him by his master, though of considerable length, fully and faithfully. He runs over the quiverings of the canary, or the clear whistlings of the Virginia nightingale or red-bird, with such superior execution and effect, that the mortified songsters feel their own inferiority, and become altogether silent; while he seems to triumph in their defeat, by redoubling his exertions."—The female lays from four to five eggs, of an ash-blue colour, marked with patches of brown; she incubates fourteen days, and is extremely jealous of her nest, being very apt to desert it if much disturbed. During the period when the young are in the nest, neither cat, dog, nor man can approach it without being attacked. When intended for the cage, they are either taken from the nest when they are very young, or at a later period by trap-cages.

MODALITY. Kant uses this word for that *category* (see *Kant*) which determines the relation of all the ideas of the judgment to our understanding. The logical modality of Kant is, therefore, the manner in which the understanding conceives the connexion and relation of ideas in a judgment; whether we leave something undecided, as in problematical judgments, or give the thing as true, as in assertory judgments, or are obliged to consider a certain connexion of ideas to be true, as in apodictical judgments. For further information, see the article *Kant*.

MODE; a particular system, or constitution of sounds, by which the octave is divided into certain intervals according to the genus. The doctrine of the ancients respecting modes is rendered somewhat obscure, by the difference among their authors as to the definitions, divisions, and names of their modes. Some place the specific variations of tones, or modes, in the manner of division, or order of the concinnous parts; and others merely in the different tension of the whole; that is, as the whole series of notes are more acute or grave, or as they stand higher or lower in the great scale of sounds. While the ancient music was confined within the narrow bounds of the tetrachord, the heptachord, and octachord, there were only three modes admitted, whose fundamentals were one tone distant from each other. The gravest of these was called the Dorian; the Phrygian was in the middle, and the acutest was the Lydian. In dividing each of these tones into two intervals, place was given to two other modes, the Ionian and the Æolian; the first of which was inserted between the Dorian and Phrygian, and the second between the Phrygian and Lydian. The system being at length extended both upward and downward, new modes were established, taking their denomination from the five first, by joining the preposition *hyper* (over or above) for those added at the acute extremity, and the preposition *hypo* (under) for those below. Thus the Lydian mode was followed by the Hyper-Dorian, the Hyper-Ionian, the Hyper-Phrygian, the Hyper-Æolian, and the Hyper-Lydian, in ascending; and the Dorian mode was succeeded by the Hypo-Lydian, Hypo-Æolian, Hypo-Phrygian, Hypo-Ionian, and the Hypo-Dorian, in descending. The moderns, however, only reckon two modes, the major and the minor. The major mode is that division of the octave by which the intervals between the third and fourth, and seventh and eighth, become half tones, and all the other intervals whole tones. The minor mode is that division by which the intervals between the second and third, and fifth and sixth, become half tones, and all the others whole tones. Another distinction also, exists between the major and minor modes; the major mode is the same, both ascending and descending; but the minor mode in ascending sharpens the sixth and seventh, thereby removing the half tone from between the fifth and sixth to the seventh and eighth.

MODEL; an original of any kind proposed for copy or imitation. It is used, in building, for an artificial pattern formed in stone or wood, or, as is most commonly the case, in plaster, with all due parts and proportions, for the more correct execution of some great work, and to afford an idea of the effect to be produced. Models in imitation of any natural or artificial substance are usually made by means of moulds of plaster of Paris. In painting, this is the name given to a man or woman who is procured to exhibit him or herself, in a state of nudity, for the advantage of the students. These models are provided in all academies and schools for painting, and the students who have acquired a tolerable use of the pencil are introduced to this kind of study. By this means, the details and porportions of the human shape, the play of the muscles, the varieties of expression, &c., are displayed and inculcated far better than by any course of lectures or any study of former works. It is desirable that the living models used in an academy, or even in a private painting room, should be changed as frequently as possible, or the student is in danger of falling into mannerism. Millin speaks of a model, of the name of Deschamps, who did duty in this way upwards of forty years in the academy at Paris, and comments on the facility with which this person's form and features might be recognized, in every variety of subject or of expression, in the paintings of the students of that period. In sculpture a model implies a figure made of wax or terra cotta, or any other malleable substance, which the artist moulds to guide him in fashioning his work, as the painter first makes a sketch, or the architect a design. When a model of any existing object is to be taken, the original is first to be greased, in order to prevent the plaster from sticking to it, and then to be placed on a smooth table, previously greased, or covered with a cloth, to guard against the same accident; then surround the original with a frame or ridge of glazier's putty, at such a distance as will admit of the plaster resting upon the table, on every side of the subject, for about an inch, or as much as may be thought sufficient to give the proper degree of strength to the mould. An adequate quantity of plaster is then to be poured as uniformly as possible over the whole substance, until it is everywhere covered to such a thickness as to give a proper substance to the mould, which may vary in proportion to the size. The whole must then be allowed to continue in this way till the plaster shall have attained its firmness; when the frame being removed, the mould may be inverted, and the subject taken from it; and when the plaster is thoroughly dry, it should be well seasoned.

MODENA; a sovereign duchy of Italy, lying in a fruitful plain of Lombardy, watered by the Panaro, and bordering on Tuscany, Lucca, Bologna, Mantua and Parma. By an act of the congress of Vienna, Reggio, Mirandola, Correggio (birth-place of the celebrated painter), Carpoli, and Rivoli, together with Massa and Carrara, and the former Imperial Fiefs, are united with the duchy of Modena proper to constitute one government; superficial extent of the whole, 2000 square miles; population, 375,000. The territory is fertile and well cultivated, the climate, in general, temperate and healthy, and the principal productions corn, rice, fruits, wine, oil, silk, honey, iron, marble, &c. The income of the state is about 1,500,000 florins; the armed force 2080 men. The ruling house is of the Austrian line of the house of Este (see *Este*); the government is absolute, and the administration is conducted by one minister and two secretaries; the Austrian civil code is in force. The present ducal house is descended from Cæsar of Este, a cousin (by a morganatic marriage) of the last duke of the former line of Este, which became extinct in 1598. The Pope Clement VIII. then took possession of Ferrara, which had previously formed a part of the Modenese territories, as a reverted fief of the papal see. In 1653, Correggio was added to the duchy by grant of the emperor of Germany, Mirandola, in 1710, and Novellara, in 1737. Hercules III. (died in 1803) married the heiress of the duchy of Massa-Carrara, and left an only daughter, who was married to Ferdinand, archduke of Austria, brother of Leopold II. In 1796, the French took possession of the country, and it was included in the Cisalpine republic, and afterwards in the kingdom of Italy. The present duke Francis IV., the son of the archduke Ferdinand, is prince of Hungary and Bohemia, and archduke of Austria. He was born in 1779, and, in 1812, married a daughter of the king of Sardinia. In 1814, he entered into possession of the estates of his grandfather, by virtue of a reversionary investment conferred on his father by the emperor, and his claims were confirmed by the congress of Vienna. He assumed the name of Este, and thus became the founder of the Austrian line of Este. His mother also entered upon the government of the duchy of Massa-Carrara, which she inherited from her mother, and to which the congress annexed the fiefs in the Lunigiana: on her death, in 1829, these passed to her son. The house of Modena-Este also holds the rich *fideicommissa* (see *Fideicommissum*) of the house of Obizzi, in Treviso. The present duke has a son, born in 1819, and two brothers. In consequence of the arbitrary character of the duke's government, an insurrection was organized, and the citizens of Modena, Reggio, Massa-Carrara and other places took arms, with the purpose of extorting from their rulers a more liberal form of government, in February, 1831. The duke was obliged to flee; but in March the Austrian troops entered Modena, at the request of the duke, and restored the authority of the government.

MODENA *(Mutina)*; capital of the duchy of the same name, situated in a fertile plain, on the canal of Modena, which unites the Secchia and the Panaro, twenty-three leagues from Florence, thirty-six from Milan; lat. 44° 38′ N.; lon. 10° 54′ E. It is the see of a bishop, and contains an old cathedral, at the foot of the tower of which hangs the bucket which was the subject of war between the Bolognese and Modenese, and of a mock heroic poem, by Tassoni, entitled *La Secchia Rapita* (the Rape of the Bucket), with a large number of churches. The ducal palace has a fine collection of pictures, and a good library of 80,000 volumes. There are also a university and other institutions, literary and charitable. The fortifications are inconsiderable; the population about 25,000. Natives, Sigonius, Muratori, Tassoni, Fallopius.

MODERN; that which belongs to recent times. The term *modern history* is used in different senses.

The Germans often date the end of modern history with the French revolution, and call the rest the *most recent history*. In the history of art, literature, customs, &c., *modern* is frequently used in contradistinction to *ancient* or *classical*. (q. v.) "Modern civilization," says A. W. Schlegel, "arose from the blending together of the elements of Northern origin and the fragments of antiquity." (See *Romantic*.) In science, *modern* is also used in contradistinction to *ancient*; thus we speak of *modern* philosophy.

MODILLION; an ornament resembling a bracket, in the Ionic, Corinthian, and Composite cornices. In Grecian architecture, however, the Ionic order is without modillions in the cornice, as are also the Roman examples of the same order, with the exception of the temple of Concord, at Rome, which has both modillions and dentils.

MODON (*mothone*); a strong city and port of the Morea, on the Mediterranean; lat. 36° 51′ N.; lon. 21° 40′ E. It is entirely surrounded by the sea, and connected with the main land by a wooden bridge. The port is unsafe, but important on account of its road and its proximity to the gulf of Coron. The city is small and badly built; the streets narrow and dirty. The Greeks became masters of it in the war of Grecian independence, and, in 1825, Miaulis burned a Turkish fleet in the road. Ibrahim Pacha took possession of Modon soon after his arrival in the Morea, but was compelled by the French to evacuate it in 1828. Previously to the war, the inhabitants amounted to about 7000. (See *Morea*.) In 1829, they did not exceed 500.

MODULATION, in music, is, in its most extensive meaning, the diversified and proper change of tones in conducting the melody, or the progression of tones in general, and the sequences of concords. In its narrower sense, *modulation* signifies that succession of tones by which a musical passage proceeds from one key into another. In quite short pieces, also in long compositions, in which the composition remains for some time in the principal tone before it passes to another, good modulation consists only in continuing for some time melody and harmony in the assumed tone, with proper changes and variety, and at last concluding in that tone. For this it is requisite that, at the very beginning, the concord should become distinctly perceptible by the sound of its essential tones, the octave, fifth, and third; and further, that the melody, as well as harmony, should be carried through the tones of the assumed scale, and that no tones foreign to it should be heard, either in the melody or in the harmony. A variety of concords, nevertheless, is necessary, that the ear may enjoy the necessary variety. The composer ought not, after the fashion of some contracted harmonists, to dwell always on two or three concords, or repeat them in transpositions, much less to return and conclude in the principal tone before the piece or the first strain is finished. The rule to let only those tones be heard which belong to the assumed scale is to be understood thus,—that a tone foreign to the scale ought to be used merely in passing, and to be left again immediately; thus, for instance, in the scale *C* sharp, one could certainly go through *G* sharp into *A* flat, and through *F* sharp to the dominant, and from this back again to the principal tone, without violating, by these two tones, foreign to the fundamental tone, *C* sharp, the effect of this scale, or destroying it. It is only necessary to avoid tones totally foreign to the scale of *C* sharp; as, for instance, *C* sharp or *D* sharp. The second kind of modulation, or that which is so called, in a more restricted sense, requires more knowledge of harmony, and is subject to greater difficulty. It consists in the art of giving to longer pieces the necessary variety, by more frequent change of tones, and requires a knowledge of the relation among the various keys, and of the tones connecting them. As it is indispensable, in longer pieces, to carry melody and harmony through several keys, and to return at last to the fundamental, it is necessary, in respect to such modulation, duly to consider the character of the composition, and, in general, whether the modulation has merely in view a pleasing variety, or whether it is intended to serve as the support of a grand and bold expression. Considerations of this kind give to the composer the rules for particular cases, and show where he may depart widely from the principal tone, and where he may remain near it; where he may thus depart suddenly, and perhaps with some harshness, and where his departures ought to be slow and gradual; because such departures are the most important means of musical expression. In pieces of a mild and quiet character, it is not permitted to modulate so often as in those which have to express violent and great passions. Where every thing relating to expression is considered, modulation also must be so determined by the expression that each single idea in the melody shall appear in the tone which is most proper for it. Tender and plaintive melodies ought only to dwell upon the flat tones, while the lighter sharp tones, which must be touched in the modulation, on account of the connexion, ought to be left immediately afterwards. It is one of the most difficult parts of the art to remain steadily without fault in a modulation. It is therefore to be regretted that those who write on the theory of the art, dwell so little on this important subject, and believe themselves to have done enough, if they show how the composer may gracefully leave the principal tone, pass through the circle of all the twenty-four tones, and return at last to the first tone. Piccini had the best views of modulation. "Modulating," he says, "is to pursue a certain path. The ear will follow you; nay, it wishes to be led by you, yet upon condition that, after you have led it to a certain point, it shall find something to reward it for its journey, and to occupy it for some time. If you do not consider its claims, it suffers you to go on, at last, without regard, and every endeavour to attract it again is but lost labour." To conduct a melody according to a given modulation; never to deviate from it, except for good reason; and in the right time to return to it in the proper way, and without harshness; to make use of changes in the modulation only as means of expression, and, perhaps, for the necessary variety,—such are the real difficulties of the art; while to leave immediately a key which has hardly been perceived, to ramble about without reason or object; to leap about because the composer does not know how to sustain himself; in one word, to modulate in order to modulate, is to miss the true aim of the art, and to affect a richness of invention in order to hide the want of it.

MODULE; an architectural measure; the lower diameter of a column being divided into two parts, one is a module; and each module is divided into thirty minutes; thus neither is a determinate, but a proportionate measure. The term is also sometimes used with reference to the different sizes of medals.

MŒLLENDORF, Richard Joachim Henry, count von, a Prussian general, born in 1724, was educated at Brandenburg, and, in 1740, admitted among the pages of Frederic II., whom he accompanied in the first Silesian war, and was at the battles of Molwitz and Chotusitz. His behaviour procured him promotion, and, in 1746, he obtained a company in the guards. He served at the siege of Prague, in 1757, and at the battle of Rossbach and that of Leuthen; for his conduct on which last occasion, he was rewarded with the order of merit. He was made a colonel in 1761, afterwards lieutenant-general, and, in 1783, governor of Berlin. In the reign of Frederic William II., he was appointed general of infantry, and commanded the Prussian troops employed in 1793, in the disgraceful dismemberment of Poland, on which occasion Mœllendorf did every thing in his power to alleviate the misfortunes of the Poles. On his return home, he was created a field-marshal, and, soon after, made governor of South Prussia. He opposed the war with France which followed; but he succeeded the duke of Brunswick in the command of the Prussian army on the Rhine, in 1794, when he gained the victory of Kaiserslautern. He was one of the principal advisers of the treaty of Basle, in 1797, after which he was made grand-marshal. Not being able to prevent, by his advice, hostilities with France, in 1806, though far advanced in years, he accepted a command, and, joining the army of the duke of Brunswick, was present at Jena and Auerstadt, where he was wounded. He retired to Berlin, and, subsequently to Havelberg, where, according to an odd Prussian usage, he held a prebend in the ecclesiastical chapter. He died there, Jan. 28, 1816.

MŒRIS; a lake of Egypt. According to Herodotus, with whose account Diodorus and Mela agree, it was, in his time, 3600 stadia, or 450 miles in circumference, and about 300 feet deep. He states it to have been entirely the product of human industry. Modern travellers describe it as at present about thirty or forty miles long and six broad, and assert it to be a natural basin. The works, therefore, which Herodotus attributes to king Mœris, must have been the canals which connected the lake with the Nile, and the mounds, dams and sluices which rendered it subservient to the purposes of irrigation. See the works of Pococke, Denon, Belzoni, &c., on Egypt.

MŒSIA; a country lying north of Thrace and Macedonia, and south of the Danube, corresponding to the modern Servia and Bulgaria. It was at a remote period inhabited by Scythians, with whom the Getæ were afterwards united. The country was conquered by the Roman emperors. The barbarians early conquered this region, and it remained in the hands of Sclavonians and Bulgarians. See *Servia*, and *Bulgaria*.

MŒSOGOTHS. See *Goths*.

MOGADOR, or MAGADORE (called by the natives *Suera*, or *Suerrah*); a seaport of Morocco, 100 miles west-south-west of Morocco; lon. 9° 20′ W.; lat. 31° 30′ N.; population, according to Jackson, 10,000; to Robins, 30,000. It was founded in 1760, by Sidi Mohammed, who spared no pains to make it the principal seat of commerce in the empire; and most of the commerce between Europe and the empire of Morocco is carried on through Mogador. It is built in a low, flat desert of accumulating sand, which separates it from the cultivated country. Supplies are brought from gardens from four to twelve miles distant. The town has a beautiful appearance from the sea, the houses being all of stone and white; but the streets, though regular and straight, are narrow and dirty, and the houses present a mass of dead wall. The houses of the foreign merchants are spacious. The roofs are flat, and the terraces serve as a walk in the evening. It consists of two parts, one of which may be called the citadel, containing the custom-house, treasury, residence of the alcaide, and the houses of the foreign merchants. The Jews, who are not foreign merchants, reside in the outer town. The harbour is about two miles in circuit; but, as the water, at ebb-tide, is only ten or twelve feet deep, large ships must anchor one and a half-mile distant from the battery. The exports consist of almonds, gums, bees-wax, goat-skins, olive oil, ostrich feathers, pomegranate-peels, and dates. See *Morocco*.

MOGREBBINS; Arabs of the western part of Egypt. Many of them are found at Cairo, and are distinguished for their industry.

MOGUL. See *Mongols*.

MOHAMMED, the founder of a religion which has spread over a great part of the East, and has been productive of much good by the abolition of the worship of idols, was a scion of the Arabic line of Koreish, and the family of Hashem, celebrated in their country as the princes of the holy city of Mecca, and guardians of the kaaba. The date of his birth is placed with most probability in A. D. 569. Mecca was his native place. His grandfather, Abdul Motalleb, a rich and noble citizen, had thirteen sons. One of them, Abdallah, married Amira, and died while his son Mohammed, or Mahomet, was still a child. As he left little property, Mohammed was educated first by his grandfather, and, after his death, by his oldest uncle, Abu Taleb. This uncle, a merchant, destined Mohammed for the same employment, and was accompanied by him on a commercial journey to Syria. On this occasion, he visited a Nestorian monastery, where he was especially distinguished by one of the monks, and received impressions which perhaps contributed to give the tone to his subsequent character. The Mohammedan writers are very prolix in their descriptions of the wonderful qualities of mind and body for which their prophet was eminent from his youth; he shared, however, the general ignorance of his countrymen. His uncle had recommended him as agent to a rich widow, named Khadijah, and he acquitted himself so much to her satisfaction, that she married him, and thus placed him in easy circumstances. She was fifteen years older than he, but, from gratitude or prudence, he lived with her in happy and faithful wedlock, and, till her death, restrained the sensual appetites which he afterwards indulged. He was still a merchant, and made a second journey to Syria, where he again had interviews with the Nestorian monks. He seems to have had, from his youth, a propensity to religious contemplation, for he was every year accustomed, in the month Ramadan, to retire to a cave near Mecca, and dwell there in solitude. At what time the idea of a new religion came into his mind, whence, in the midst of an idolatrous people, he derived the conviction of the unity of God, and to what degree he blended the ambition to assume the prophetic character with the struggle for personal aggrandizement, are questions to which only conjectural answers can be given. That an untaught Arab should conceive elevated views of the state of man in his age, and found on them comprehensive projects, is not credible: in all probability, his first plans were limited to his countrymen. That he was honest in his zeal to abolish idolatry, and disseminate a purer doctrine, although he sought to obtain this object by deception, may be easily believed, if we remember the many examples of a similar inconsistency in other legislators and religious reformers.

Mohammed began his pretended mission A. D. 609, in the fortieth year of his age. He first converted his wife Khadijah, to whom he communicated the particulars of an interview with the angel Gabriel, by whom he was declared an apostle of God. Through her instrumentality, her uncle or cousin Waraka was gained, who is said to have been a Christian, and well acquainted with the Old and New Testaments. These were followed by Mohammed's servant, Zeid, to whom he gave his freedom, and by his young nephew, the fiery Ali. Of great importance was the accession of Abubeker, a man of estimable character, who stood in high respect, and persuaded ten of the most considerable citizens of Mecca to follow his example. They were all instructed by Mohammed in the doctrines of the *Islam*, as the new religion was styled, which were promulgated as the gradual revelations of the divine will, through the angel Gabriel, and were collected in the Koran. Three years passed in the quiet dissemination of his doctrines: in the fourth, Mohammed invited his relatives of the family of Hashem to an entertainment, openly announced to them his prophetic mission, and asked which of them would undertake the office of his vizier. All were silent, till the youthful Ali declared his readiness to do so, and, at the same time, his resolution to inflict vengeance on all who should dare to oppose his master. In vain did Abu Taleb, the father of Ali, dissuade them from the undertaking. But, although he remained himself unconverted, he did much to promote the new doctrines, by protecting Mohammed against his enemies, and affording him refuge in times of danger. On several occasions Mohammed was attacked by the adherents of idolatry with open force, and compelled to change his residence; but he often had the satisfaction of converting his bitterest enemies. In the tenth year of his prophetic office, he suffered a severe loss in the death of Abu Taleb and his faithful Khadijah. Deprived of their assistance, he was compelled to retire, for a time, to the city of Tayef. On the other hand, he was readily received by the pilgrims who visited the kaaba, and gained numerous adherents among the families in the neighbourhood. At this time occurred Mohammed's famous nocturnal journey to heaven on the beast Alborak, under Gabriel's guidance, respecting which the Koran contains some obscure intimations. In the twelfth year, the Islam was also spread among the inhabitants of Medina (Yathreb), several of whom swore fidelity to the prophet, and proffered their assistance. Mohammed now adopted the resolution of encountering his enemies with force. Only the more exasperated at this, they formed a conspiracy to murder him: warned of the imminent danger, he left Mecca, accompanied by Abubeker alone, and concealed himself in a cave not far distant. Here he spent three days undiscovered, after which he arrived safely at Medina, but not without danger. This event, from which the Mohammedans commence their era, is known under the name of the *Hegira*, which signifies *flight*. In Medina, Mohammed met with the most honourable reception: thither he was followed by many of his adherents. Mohammed now assumed the sacerdotal and regal dignity, married Ayesha, daughter of Abubeker, and, as the number of the faithful continued to increase, declared his resolution to propagate his doctrines with the sword. The hopes of booty added new fervour to the religious zeal of his partisans. Their first great military exploit was the spoiling of a rich caravan, led by Abu Sophian, the chief of the Koreishites, with a strong guard. Mohammed surprised them, with an inferior force, in the valley of Beder, and inflicted on them a total defeat. He took a rich booty, and a number of prisoners. Other successful enterprises followed; but, in the third year of the Hegira, Abu Sophian, with 3000 soldiers, attacked Mohammed with 950, on mount Ohud, not far from Medina. A desperate conflict ensued, in which the Moslems were utterly beaten, and the wounded prophet hardly saved his life. This misfortune naturally shook the authority of him whose pretended mission from God should have secured him the victory. But by attributing the fault to the sins of the Moslems, by promising the slain a paradise provided with all sensual enjoyments, and inculcating an unconditional predestination, he succeeded in restoring his tottering credit. Good need had he of it in the following year, 625, when Abu Sophian appeared before Medina with 10,000 men. Mohammed prudently limited himself to the defensive; but the enemy raising the seige, after twenty days, on account of internal discord, Mohammed, under the pretence of a divine command, led his party against the Jewish race of Koreidha, who had made common cause with the enemy. After twenty-five days, the Jews were compelled to surrender their chief fortress to the will of the conqueror, who took the most bloody revenge, slaughtered between 600 and 700 men, and carried away the women and children into captivity. Some years afterwards, he also took Khaibar, the principal seat of the Jewish power in Arabia, by which means he completed the subjugation of this unhappy people. It is probable that the many murders and cruelties practised on his enemies were sufficiently justified in the eyes of his followers, by his divine mission; but they must have been highly offended by the violation of all right and decency, of which he was guilty in his passion for Zeinab, the wife of his emancipated slave and adopted son Zeid, while a particular chapter was introduced into the Koran, to give him power to marry her; this he did publicly, without regard to a degree of relationship which the Arabs had hitherto held inviolable. This weakness, with respect to the female sex, increased with the years and authority of Mohammed. Besides the numerous wives, whom he took at different times, he indulged in several transient amours, such as are forbidden in his own laws, and always justified his incontinency by new chapters in the Koran. That such shameless pretences could have any effect rather proves the credulity and fanaticism of the people than his own talents of deception. At the same time, his doctrines and authority gained ground among the neighbouring tribes. The expeditions of his officers rarely failed to produce a considerable booty. He was himself almost worshipped by his partisans. His views, meanwhile, continued to expand, and, in the seventh year of the Hegira, he sent a summons to the principal neighbouring princes, particularly Chosrou Parviz, king of Persia, Heraclius, emperor of Constantinople, Mokawkas, ruler of Egypt, the king of Ethiopia, and the princes of various districts of Arabia, to embrace the new revelation of the divine law, made through him. The manner in which this embassy was received differed according to the power and pride of those to whom it was directed. The more remote and powerful gave no heed to it: on the contrary, the weaker and nearer, who were informed of his increasing power, had cause to fear his arms. It was of particular importance to him no longer to be an exile from Mecca, the holy city, which was in a high degree the object of the adoration of the Arabs. He appeared, therefore, at the head of 1400 men, with the ostensible purpose of peaceably visiting the temple of Mecca. The Koreishites opposed his entrance, and compelled him to a treaty in the seventh year of the Hegira. For three days only, he and his partisans were to be allowed to pay their devotions, unarmed, in the kaaba; on the fourth day, he was to withdraw. He succeeded, however, on this occasion, in converting three persons of influence among the Koreishites, who had afterwards still greater renown among the Moslems—Caled, Amru, and Othman. In the eighth year of the Hegira, a Mohammedan army, under Zeid's command, advanced against the city of Muta, in Palestine, where the governor of the emperor Heraclius had murdered a Moslem ambassador. Zeid was slain, and the defeat of the Moslems was prevented solely by the courage of Caled, who, on this occasion, obtained the appellation of "sword of God." A breach of compact on the part of the Koreishites gave Mohammed the desired opportunity to lead against Mecca 10,000 well-armed soldiers, inspired by pious zeal. The terrified Koreishites made little resistance, and received life and liberty only on condition that they embraced the Islam. The idols of the kaaba were demolished, but the sacred touch of the prophet made the black stone again the object of the deepest veneration. The temple became the principal sanctuary of the religion of Mohammed, and its professors alone are allowed access to the holy city of Mecca. This important event took place in the eighth year of the Hegira. The destruction of some celebrated idols, and the subjugation of various Arab tribes, now employed the Moslem arms. In the valley of Honain, not far from Mecca, where Mohammed incurred great personal danger, he achieved the victory only by the utmost exertions. The following year the Mohammedans call the "year of embassies," because a number of Arab tribes announced by deputies their submission and conversion. At the head of 30,000 men, among whom were 10,000 cavalry, Mohammed was resolved to anticipate the hostile plans of the emperor Heraclius. He marched into Syria to Tabuk, half way to Damascus, but returned to Medina, and contented himself with summoning the emperor in writing to embrace his doctrines. After his return, he promulgated a new chapter of the Koran, revoked all regulations in favour of idolaters, and declared all the compacts concluded with them null. He might now be regarded as master of the whole of Arabia, although all the inhabitants had not yet received his religion. He allowed the Christians a free exercise of their worship on the payment of a tribute. In the tenth year of the Hegira, Mohammed undertook his farewell pilgrimage to Mecca. On this occasion, he was surrounded with the utmost splendour, and attended by 90,000, or, as some say, 150,000 friends. This was the last important event of his life. He died soon after his return to Medina, in the arms of his wife Ayesha, in the eleventh year of the Hegira, in his sixty-third year. Of all his wives, the first alone bore him children, of whom only his daughter Fatima, wife of Ali, survived him.

The Mohammedan writers undoubtedly exaggerate the corporeal and mental endowments of their prophet: it is, however, very credible, that there was a prepossessing majesty in his appearance, and that he united much natural eloquence with a decisive and enterprising mind. By these gifts, he succeeded in exalting himself above his equals, and gaining confidence and popularity. Compared with his countrymen, he stands pre-eminent; compared with other legislators and monarchs, he holds but an inferior rank. Whether he himself believed what he promulgated as a divine revelation is a hard question to answer. Most probably he ought to be regarded as a religious enthusiast, who deemed himself actually inspired by the Divinity, but was not so entirely blinded as to overlook the means of making his doctrines acceptable to the people, and of confirming his dominion over their minds. Thence the fabrication of his interview with the angel Gabriel; thence his visionary journey through the seven heavens of paradise; thence his indulgence of the sensual desires of a sensual people. The first tenet of his creed was, "Allah alone is God, and Mohammed is his prophet." At the same time, Moses and Christ were regarded, in his system, as divinely inspired teachers of former times, and he by no means denied the authenticity of the sacred histories and revelations of ancient Judaism and Christianity, which he only believed to be corrupted. The paradise which he promised to his faithful adherents was a heaven of sensual pleasure; he himself perhaps anticipated no other. His morality was compiled from the ancient Jewish and Christian systems. The faithful adoration of Allah as the only God, unwavering obedience to the commands of the prophet, the necessity of prayer, charity to the poor, purifications, abstinence from forbidden enjoyments (especially from strong drinks—this prohibition was caused by the quarrels that arose among his adherents), bravery, upholding even to death the cause of God, and entire resignation to unavoidable fate, are the chief points of his moral system. Of solemnities, fasts, and usages such a religion for a sensual people could not be destitute; but the injunction of a pilgrimage to Mecca and Medina was unquestionably a political measure, in order to sanctify for ever the original seat of the Islam, and to secure permanently the political and religious importance of Arabia. These doctrines are contained in the Koran, to which was soon after added a second collection,—*Sunna* (second book of the rules of life, founded on Mohammed's example.) But all Mohammedans do not receive the latter: those who do, are therefore called *Sunnites*. One of the principal means of the rapid and extensive diffusion of his doctrines and dominion was force, all who did not submit of their own accord being compelled to do so at the edge of the sword. Rarely do we find in his history any traces of his having made use of women for promoting his plans, although he allowed polygamy, with some restrictions, and concubinage without any bounds. That he persuaded his first wife that the attacks of epilepsy which he had were celestial trances, and that she first procured him adherents by the propagation of this fable, seems to be a tale, devised by his Christian opponents, to expose the prophet to contempt. Certain it is that he himself declared he did not work miracles. His disciples, nevertheless, ascribe to him the most absurd miracles; for example, that a part of the moon fell into his sleeves, and that he threw it back to the heavens; that stones, trees, and animals proclaimed him aloud to be the prophet of God, &c.; but of such fables we find abundance in the legends of the Christian saints. In a moral view, he can never be compared with the divine Founder of Christianity. His system has been widely propagated in Asia and Africa. The reverence which the faithful Moslems pay to the prophet, and all that is connected with him in the remotest degree, is as great as the reverence of relics has ever been in Christendom; thus, for example, the camel which carries the Koran to the kaaba, and, in the territory of Mecca, an enormous number of doves, which must not even be scared from the fields, much less be killed, because they are thought to be descended from the dove that approached the ear of Mohammed, are objects of the most sacred reverence. But the wonder-loving populace alone gives credence to the fable that Mohammed's coffin is suspended in the air: on the contrary, he lies buried at Medina, where he died, and an urn, enclosed in the holy chapel, constitutes his sepulchre, which is surrounded with iron trellis work, and is accessible to no one. The (so called) *Testament* of Mohammed is a spurious work of later times. Mohammed's doctrines have given rise to many sects, among which the Sunnites and Shiites, the chief ones, still entertain the most violent mutual hatred among the Persians and Turks. See *Hist. of Mohammedanism*, &c., by Charles Mills; also the articles *Koran*, and *Islam*.

MOHAMMED II., Turkish emperor, surnamed Bujuk, the Great, born at Adrianople in 1430, succeeded his father, Amurath II., in 1451. He renewed the peace made by his predecessor with the Greek emperor, but resolved to complete the conquest of the enfeebled Greek empire by the capture of Constantinople. The Christian powers in Europe remained quiet spectators. April 6, 1453, Mohammed appeared before Constantinople, to which he laid siege with an army of 300,000 soldiers, and by water with 300 galleys and 200 small vessels. The besieged had drawn strong iron chains before the harbour, and made a brave resistance, though they had but about 10,000 men to oppose so great a force. But Mohammed, having contrived to get a part of his fleet over land into the harbour, and caused a bridge of boats to be constructed and occupied with cannon, the Greeks were overcome, after a defence of fifty-three days, and the empire came to its end. The city was taken by storm on the 29th May, and abandoned to pillage. The emperor Constantine Palæologus fell, at the commencement of the assault, sword in hand. In a few hours, the conquest of the city was completed. The conquerors gave themselves up to all cruelty and excess. During the sack, a young princess, named Irene, was brought to Mohammed, and for three days he compelled her to satisfy his passion. Some janizaries murmured, and a vizier even dared to reprove him. Mohammed immediately sent for the captive, took her by the hair, and murdered her before the discontented, with the words, "Thus Mohammed deals with love." When he entered the city, he found it desolate; but as he designed it for the principal seat of his empire, he strove to attract new inhabitants by promising the Greeks full religious liberty, and permitting them to choose a new patriarch, whose dignity he himself increased. Constantinople under him soon became again flourishing. He restored the fortifications, and, for greater security, caused the forts called the *Dardanelles* (q. v.) to be erected at the mouth of the Hellespont. Mohammed pursued his conquests, which were checked for a time by Scanderbeg, prince of Albania, who was favoured by the mountainous character of the country. The sultan finally concluded peace with him, but after Scanderbeg's death, in 1466, soon subjugated all Albania. His further advances into Hungary were prevented by the celebrated John Hunniades, who obliged him, in 1456, to raise the siege of Belgrade, in which he had lost 25,000 men, and had been himself severely wounded. The son of the great Hunniades, king Matthias Corvinus, also kept the Turks from Hungary, and even took from them Bosnia. On the other hand, Mohammed conquered, in a short time, Servia, Greece, and all Peloponnesus, most of the islands of the Archipelago, and the Greek empire of the Comneni, established in the beginning of the thirteenth century, at Trebisond, on the coast of Asia Minor. The Christian powers began to be apprehensive of the progress of his arms, and at the instigation of pope Pius II., in 1459, a crusade against the Turks was resolved upon at Mantua, which was never, however, executed, on account of the bad constitution of most of the European states. From the republic of Venice Mohammed tore Negropont, in 1470. He also stripped them of other possessions, and took Caffa from the Genoese, in 1474. Frequent wars with the Persians prevented the further prosecution of his enterprises against the Christian powers. In 1480, he attacked the island of Rhodes, but was repulsed by the knights with great loss. He now turned his arms against Italy, took Otranto, and would probably have pursued his conquests in this country but for his death, in 1481, on an expedition against Persia. During his reign of thirty years, he had conquered twelve kingdoms and upwards of 200 cities. On his tomb he ordered the words to be affixed, "I would have taken Rhodes and conquered Italy," probably as a stimulus to his successors. His character was distinguished by talents, ambition, courage, and fortune, and disgraced by cruelty, perfidiousness, sensuality, and contempt of all laws. He spoke Greek, Arabic, and Persian; understood Latin; drew and painted; had a knowledge of geography and mathematics, and of the history of the great men of antiquity. In short, he would have been a hero, had not his cruelties blackened his reputation. Policy sometimes kept in check the impetuosity of his character; but he was too often the slave of passions, though all the cruelties ascribed to him are not to be credited.

MOHAMMED IV., born in 1642, was raised to the throne while a boy of seven years, his father, Ibrahim, having been murdered in an insurrection of the janizaries. His grandmother, an ambitious woman, managed the government, but perished in a revolution of the seraglio. The celebrated grand-vizier Mohammed Kuperli (or Kuprili) was now placed at the head of the government. To this great minister, and to his equally great son and successor, the Turkish empire was indebted for the consequence which it maintained till the end of the seventeenth century. Mohammed was himself an insignificant personage, whose principal passion was the chase. Kuperli turned his chief attention to the restoration of the internal tranquillity of the empire, to which he sacrificed a great number of persons. The war begun in 1645 against the Venetians, mainly respecting the island of Candia, was, therefore, but weakly prosecuted. But, in 1667, Achmet Kuperli, one of the greatest Turkish generals, undertook the famous siege of this island (see *Candia*), which lasted two years and four months. The capitulation was signed September 5, 1669, at the same time with the terms of peace between Venice and the Turks. A war had already broken out (1660) with the emperor Leopold, on account of Transylvania. The Turks had made considerable progress in Hungary, when they were totally defeated, August 3, 1664, by Montecuccoli, at St Gothard. Nevertheless, to the astonishment of all, the emperor accepted the disadvantageous truce of Temeswar, of twenty days, proffered by the Turks. Never had the Turks approached so near the boundaries of Germany as now. The anarchy which prevailed in Poland under king Michael, and the disturbances of the Cossacks, gave occasion, in 1672, to a war of the Turks against Poland, which had to purchase peace on ignominious conditions. But the great Polish general John Sobieski revenged the ignominy of his nation by a decisive victory at Choczim, in 1673, and, in 1676, obtained from the Turks an honourable peace. Sobieski also contributed most essentially to the relief of Vienna, which was besieged for more than six weeks by the grand vizier Kara Mustapha, with 200,000 men, in the war caused, in 1683, by the malcontents in Hungary. The Turks were attacked in their camp, September 2, by the allied Christian army, and defeated, with extraordinary loss. The grand-vizier atoned for his ill success with his life. The emperor, Poland, Russia, and Venice, now concluded an alliance against the Turks, who suffered losses in every quarter:—for example, they were utterly defeated at Mohacz by Charles, duke of Lorraine. As all these misfortunes were attributed to the effeminacy and inactivity of the sultan, Mohammed IV., he was deposed in 1687, and died, in prison, in 1691.

MOHAMMED ALI (also MEHEMMED ALI) Pacha, viceroy of Egypt, is of Turkish origin, and was born at Cavala, in Macedonia, in the year 1769. His life, like that of his contemporary, Mahmoud II., is so intimately connected with the modern history of the East, that we shall here take a brief view of it, although death has not yet marked out the limits of his career. By his boldness, sagacity, and courage, he has raised himself from an humble station to that of a sovereign, before whom Arabia and Nubia tremble, and who is flattered by his proud master, the Porte. He has ruled Egypt, since 1806, on European principles. From his youth, Mohammed exhibited an extraordinary penetration, uncommon dexterity in all bodily exercises, and a fiery ambition. The Turkish governor at Cavala gave this poor young orphan a common education, and then an office and a rich wife. Reading and writing he learned after he had become a pacha. A merchant of Marseilles, named Lion, who lived in Cavala, and was his patron, inspired him with an inclination towards the French, and with religious tolerance. On this account the residence of strangers in Egypt has been facilitated. In 1820, the viceroy gave the family of Lion proofs of his gratitude. His first employment was the tobacco trade, and he is now engaged in great commercial enterprises, extending even to India. His first campaign was in Egypt, against the French (1800), as commander-in-chief (*binbashi*) of the contingent of Cavala. The capitan pacha, who was a witness of his bravery in the battle of Rahmanieh against general Lagrange, elevated him to a higher post, in which he also acquired the favour of the Albanian troops. He established his reputation as a soldier in the long contest of the pachas with the mamelukes, after the French had abandoned Egypt in 1802; but soon after the governor became jealous of the ambitious Mohammed, and, to get rid of him, obtained his appointment as pacha of Saloniki. Mohammed's influence was already so great, that the inhabitants of Cairo took arms in his favour, and the ulemas and sheiks represented by agents to the divan of Constantinople, that Mohammed alone was able to restore order and tranquillity to Egypt, which the governor Khurschid Pacha plundered and oppressed. At the same time, they conferred on him the office of governor; but the prudent Mohammed refused the external dignities of the office, although in secret he directed affairs. At length the Porte (April 1, 1806) confirmed him as governor of Egypt, and elevated him to the rank of a pacha of three tails. He maintained himself in this office by the attachment of the Albanians and the influence of France, when the Porte had been prevailed on by the British to appoint, in his stead, the mameluke Elfy Bey, governor of Egypt. Mohammed soon restored the distracted country to order, accustomed the undisciplined troops to obedience, and compelled the British, who, in March, 1807, had occupied Alexandria, after several battles, to leave Egypt in September. He then reduced the mameluke beys to subjection, and, in March, 1811, on a festive occasion, perfidiously murdered 470 of them; the rest were decapitated. They were accused of secret plots. The French mamelukes alone remained unmolested. (See *Mamelukes*.) From this time tranquillity reigned in Egypt. The campaign of Ibrahim Pacha, the second son of the viceroy (the first died in the field), against the Wahabees, in 1816, had a successful issue; he deprived that sect of Mecca and Medina, conquered their capital, Derayeh, in 1818, and sent their leaders prisoners to Constantinople. The expedition to Nubia and Sennaar, in 1821, which the French traveller Cailliaud (see *Meroë*) accompanied, in the expectation of discovering gold mines, ended with the murder of the leader, Ismael Pacha, the youngest son of the viceroy. At the same time Mohammed directed the internal administration of affairs. Armies and fleets, fortifications, and the maintenance of the troops were established upon the European plan; telegraphs and Congreve rockets were prepared; the ulemas were transformed into paid officers; agriculture was extended, the races of sheep and horses improved; commerce and manufactures flourished; Europeans were protected and rewarded, and learned travellers encouraged. Ismael Gibraltar and others were sent, in 1818, to Europe, in order to form alliances; the canal of Mahmoud was dug, connecting Cairo with Alexandria; olive and mulberry trees, hitherto unknown in Egypt, were planted, sugar refineries, and saltpetre manufactories, and cannon founderies established, quarantine rules and vaccination introduced, schools founded, &c.—The British, French, and other nations now sought the friendship of Mohammed. The Porte was terrified at his power, as he had, during the struggle with the Greeks, established himself in Candia. He was, however, appointed commander-in-chief against the Greeks in 1824; but he sent his son Ibrahim, at the head of an army of 16,000 men, together with a fleet under the command of Ismael Gibraltar, who was to conquer the Morea, and establish a negro colony there. The latter, with a capudan pacha, was defeated in several naval actions, in September, 1824, by the Greek admiral Miaulis, and Canaris, the commander of the fire-ships; but a second Egyptian expedition, succeeded, in March, 1825, in effecting a landing at Modon, and captured Navarino, Tripolizza, and other places. Ibrahim then laid waste the Morea, and sent its inhabitants as slaves to Egypt. In October, 1827, a third expedition of the viceroy was blockaded in the harbour of Navarino by the British admiral Codrington and the French admiral De Rigny, in consequence of the treaty of July 6, 1827, and it was required of the viceroy by the allied powers, that he should refrain from every act of hostility towards Greece. The combined Turkish and Egyptian fleets were shortly after destroyed at this place. See *Navarino*.

Mohammed is, in reality, the sovereign of Egypt, though he preserves the external marks of respect towards the grand seignior. He is a despot, and is obliged to be so; but at the same time he possesses political knowledge, and often exhibits magnanimity. He is the absolute lord of the soil and all its productions. He holds the monopoly of the productions of Egypt, and of the East India goods which pass through Egypt; only a few houses, designated by himself, are permitted to take part in the commerce.

The purchase of ships of war in France, and his expeditions against the Morea, exhausted his treasures, and caused oppressive taxes. In Egypt, he protects the Greeks as well as the Franks; he causes young Turks to be educated in England and France in the European manner; the Christians possess his confidence, but there is no security for the permanence of his plans. Ibrahim himself appears not to approve of his father's projects of colonization and civilization. Had Mohammed Ali never been stained with treachery and murder, he would perhaps deserve to be called the second Saladin of Egypt.—See Mengin's *Histoire de l'Egypte sous le Gouvernement de Mohammed Aly*, etc. (Paris, 1823, 2 vols.); *Histoire de la Régénération de l'Egypte*, by Planat, a staff-officer in the pacha's service (Geneva, 1830); the travels of Madden, Lushington, Hanniker, Minutoli, &c. Mohammed has a grandson, whom he is carefully educating, and two married daughters. (See the articles *Egypt*, *Nubia*, *Wahabees*, *Greece*, *Revolution of*.) In 1827, he had twelve regiments organized, clothed in uniform, and armed after the European manner, each regiment consisting of 4000 men. They were raised by impressment from the Arabs and peasantry.

MOHAMMED, Sheik; the founder of the famous sect of the Wahabees, who derive their appellation from Abd el Wahab, the father of Mohammed. For an account of him see the article *Wahabees*.

MOHAMMEDAN ERA. See *Epoch*.

MOHAWK; a large branch of the Hudson or North river of New York, which rises in the north-east part of Oneida county, about twenty miles north of Rome, to which place it runs nearly south, and then turns eastward towards the Hudson, which it enters by several mouths, between Troy and Waterford, after a course of about 135 miles. Its source is within a short distance of Black river, of lake Ontario; and from Rome it winds along through a deep valley, bordered in many places by high and broken hills, and in others by extensive and very valuable alluvial tracts. The stream of the Mohawk is unequal, with many breaks and rapids, and two considerable falls. With the aid of canals, the Mohawk is navigable from Schenectady to Rome; but it serves the purposes of navigation principally by feeding the numerous canals which cross it or range near its borders. It is remarkably well adapted for supplying water-power for all manufacturing purposes. The land on its borders is very rich. It is excellent for wheat, and good also for all common purposes of agriculture.

MOHAWKS; a tribe of North American Indians, belonging to the confederacy of the Five (afterwards Six) Nations. (See *Iroquois*.) With the rest of the confederacy, they adhered to the British interest during the war of the revolution, and left the country, on its termination, for Canada, where lands were assigned them on the Grand river. Their village is composed of houses built of logs, with few of the conveniences of civilized life. The Mohawks lived originally on the river which still bears their name, and were remarkable for their courage and ferocity. Brandt was a Mohawk chieftain.

MOHICANS, or MOHEGANS; a tribe of Indians formerly occupying the western parts of Connecticut and Massachusetts. See *Iroquois*.

MOIDORE, or MOED'OR, or MOEDA; a gold coin formerly used in Portugal (from 1690—1722) of the value of six dollars.

MOINES, Des, the largest western tributary of the Mississippi above the Missouri, enters the Mississippi in about lat. 40°. It is 150 yards wide at its mouth, and is supposed to be 800 miles long, and navigable for boats for 300 miles.

MOIRA, Earl of. See *Hastings, Francis*.

MOITTE, Jean Guillaume, a French statuary, was born at Paris, in 1747, of a family which produced several distinguished engravers and architects, and early displayed so much talent for drawing, that Pigalle, then the most eminent sculptor in Paris, requested that he might receive the young artist as a pupil. In 1768, Moitte went to Italy, and studied the remains of ancient art, without, however, neglecting the study of nature. He returned to France in 1773, was one of the first members of the national institute, received the cross of the legion of honour from Napoleon, and died in 1810. His works are distinguished for correctness of design, elevated conception, beauty of proportion, variety of expression, and delicacy of taste. A statue of a *sacrificateur* (1783); the bass-reliefs of several of the barriers of Paris; that of the frontispiece of the Pantheon, representing the country crowning the civic and warlike virtues (destroyed after the restoration, when the Pantheon was consecrated as the church of Geneviève); that for the tomb of Desaix; several bass-reliefs in the Louvre, representing the muse of history, with Moses and Numa; warriors devoting themselves for their country, in the chamber of peers—are among his principal productions.

MOLA, Peter Francis, an eminent painter, was born at Coldra in 1621, or at Lugano in 1609. He was the pupil of the cavalier D'Arpino and of Albani. On leaving the last master, he went to Venice, and studied under Guercino, perfecting himself in colouring from the productions of the Venetian school. On his return to Rome, he painted several scriptural pieces for popes Innocent X. and Alexander VII., of which that of Joseph discovering himself to his brothers, in the Quirinal, is the most esteemed. He is still more distinguished as a landscape painter, for his varied composition and vigorous touch. In 1665, he received an invitation to the court of Louis XIV., with which he was about to comply, when a sudden disorder carried him off. There was another *Mola* (*John Baptist*), said by some to be his brother, who acquired some reputation in history and landscape; but he is much inferior to the preceding.

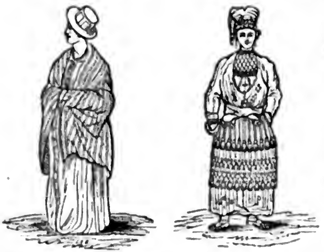
MOLAI, James de, the last grand-master of the order of the knights Templars, of the family of the lords of Longwic and of Raon. He was admitted into the order about 1265, and, on the death of William de Beaujeu, was unanimously elected to the office of grand-master. The wealth and power of the Templars, their pride and their dissolute manners, created them a multitude of enemies, and led to their destruction. In 1307, an order was issued for the general arrest of the knights throughout France. They were accused of heresy, impiety, and other revolting crimes. Fifty-seven were burned in 1311, and the order was abolished the following year, by the council of Vienne. Molai, with his companions, Guy Dauphin of Auvergne and Hugh de Peralde, was detained in prison at Paris till 1313, when their trial took place before commissioners appointed by the pope; and, confessing their crimes, they were condemned to perpetual seclusion. Molai and Guy, having subsequently retracted their confessions, which they had made in the hope of obtaining their freedom, were executed as relapsed heretics. They perished in the flames at Paris, March 18, 1314, declaring their innocence to the last. See *Templars*.

MOLAR TEETH. See *Teeth*.

MOLASSES, or MELASSES; the liquid or uncrystallizable part of the juice of the sugar-cane, which separates from the granulated part or sugar. (See *Sugar*.) The name is also applied to the similar portion of any other vegetable juice from which sugar is obtained.

MOLDAU; a river of Bohemia, which rises in the Bohmerwald (Bohemian forest), flows north through Bohemia, by Budweis and Prague, and empties itself into the Elbe opposite to Meluik, and thus furnishes Bohemia a communication with the North sea. A project was formed for uniting the Moldau, by means of a canal, with the Danube; but, on account of the difficulty of cutting through the mountains, a railroad has been considered a more practicable undertaking. See *Austria*.

MOLDAVIA (in German, *Moldau;* Turkish, *Bogdan*); a province of the Ottoman empire, with the title of *principality*, extending from lat. 45° 12′ to 48° 5′ N., and from lon. 25° 10′ to 28° 20′ E., bounded on the east by the Russian province of Bessarabia, from which it is separated by the Pruth, on the south by Bulgaria and Walachia, and on the west by Transylvania; superficial extent, 17,000 square miles; population differently stated at from 360,000 to 500,000. Previously to the treaty of 1812, it extended eastward to the Dniester, with a superficial area of about 34,000 square miles, and a population of 800,000. The western part of the country is mountainous, branches of the Carpathian chain projecting towards the interior; the southern is low and marshy. The winters are severe; the heat is great in summer, but the nights are cool. The soil is fertile, but war and an oppressive government have prevented it from being well cultivated. Corn, fruits, wine, honey, wax, and tobacco of an inferior quality, are among the principal productions; the gold, silver, and iron mines are not worked; mineral salt and saltpetre are produced in large quantities. The greater part of the country is devoted to pasturage, and immense numbers of horses, black cattle, sheep, and swine are raised by the inhabitants. The horses are strong, active, and gentle, and 10,000 have been exported annually to Austria and Prussia. The cattle are of an excellent quality, and have been sent generally to Poland and Russia. The inhabitants are strongly attached to the Greek church. The Moldavians are supposed to be descendants of the ancient Dacians, whose country they occupy, of Roman colonists, and of the Sclavonians, who conquered Moldavia. The following cut represents the costume of a male and female. Their language is a corrupt Latin, mixed with Sclavonic. They call themselves *Rumuni*, or *Rumuniasti*, probably a corruption of *Romani*. They are described as ignorant, indolent, treacherous, and vindictive; although not slaves, they have always been the subjects of the severest oppression. The different professions and trades are almost entirely in the hands of Armenians, Jews, Italians, and Russians. The capital of the province is Jassy (q. v.), which is also an archiepiscopal see; Okna and Galacz are the other principal towns; the Pruth and the Sereth, both emptying into the Danube, are the chief rivers. Moldavia has generally shared the fate of Walachia, with which, under the Romans, it formed the province of Dacia Transalpina (beyond the Carpathian). Bogden, a Walachian chief, established himself in the country in the twelfth century, and from him it was called *Bogdiana*, but afterwards received the name of *Moldavia*, from the river Moldava, a branch of the Sereth. Although the Walachians and Moldavians were of the same origin, and spoke the same language, they were often at war with each other, and formed two independent states. (See *Walachia*.) In the fourteenth century, Moldavia became tributary to the kings of Hungary, and in the beginning of the sixteenth century, became a dependant of Turkey. The inhabitants were permitted to retain their laws and privileges, and the free exercise of their religion, and to appoint their waywode, or hospodar. In the beginning of the eighteenth century, the Porte assumed the right of appointing the hospodar, and from that time the dignity was sold to the rich Greeks of Constantinople, who practised every means of extortion upon the inhabitants. In 1812, the region lying to the east of the Pruth was ceded to Russia. In 1821, the hospodar Michael Suzzo, a Greek, received the Greek insurgents with open arms, and raised the standard of revolt. Turkish armies were poured into the unhappy province, which became a scene of the most barbarous atrocities. (See *Greece, Revolution of*, and *Ypsilanti*). It was not evacuated until 1826, after the most pressing demands of Russia. It was then stipulated that the hospodars should be chosen by the Boyards, from their own number, for a term of seven years, subject to the confirmation of the Porte. In 1828, the Russians occupied Moldavia without resistance. By the peace of Adrianople, 1829, it is provided that the hospodar shall be named for life; that the province shall pay a tribute of 165,000 piastres to Turkey, and be subject to no requisitions; that no Turk shall reside in the country, which remains in the hands of Russia till indemnification for the expenses of the war shall be made by the Porte. See *Russia*, and *Ottoman Empire*.



MOLE (*talpa*). The mole is from five to six inches in length: its head is large, without any external ears, and its eyes so very minute, and concealed by its fur, that it is a vulgar opinion, that it is deficient in these important organs. Its fore legs are very short, and extremely strong and broad, turned outwards, by which conformation it is enabled to burrow with great ease. The snout is slender, strong, and tendinous, and it has no external appearance of a neck. The females bring forth four or five young, about the month of April, for the preservation of which, the parents construct a habitation, with great diligence and care. They first raise the earth by forming an arch, leaving partitions or pillars at certain distances; beat and press the earth, interweave it with the roots of plants, and, at last, render it so hard and solid, that the rain cannot penetrate. They then raise a small hillock under the principal arch, on which they construct the nest for their young. This internal hillock is pierced with sloping holes, which serve as passages for the parent animals to go out. These paths are firm, and extend about twelve or fifteen paces, issuing from the nest like rays from a centre.—Moles live in pairs, and are chiefly found in places where the soil is loose and soft, and affords the greatest quantity of worms and insects. They exhibit great dexterity in skinning the worms, which they always do before they eat them, stripping the skin from end to end, and squeezing out all the contents of the body. The skin of the mole is extremely tough; its fur is close set, and as soft as the finest velvet: it is usually black, but has sometimes been found spotted with white, and, more rarely, altogether of that colour. Though common in almost all parts of Europe, it is said to be entirely unknown in Ireland. Linnæus says that it passes the winter in a state of torpidity: in this, however, he is contradicted by Buffon, who states, that it sleeps so little in winter, that it burrows in the same manner as in summer. The destruction caused by these little animals is sometimes very great; and such are their numbers, that Buffon caught 1300 of them in three weeks. In Holland, we are also told that they were so numerous, in 1742, as to destroy the hopes of the agriculturists. Even in ancient times, it appears that they were considered as pests, and a temple was erected, in Æolia, to Apollo Smintheus, or the destroyer of moles. From an account given by Mr Bruce, in the Transactions of the Linnæan Society of London, it appears that the mole is able to swim great distances. Doctor Darwin has given a very interesting paper on these animals in his *Phytologia*, and of the best methods of capturing them, to which we refer those of our readers who wish for fuller information.

The mole of America is wholly different from the mole of Europe, and has been termed the *shrew-mole*, under which word a description of it will be found in this Encyclopedia.

MOLE CRICKET (*gryllus gryllo-talpa*, L.). The legs and fore feet of these insects are very large and strong, and placed, like those of the mole, so as to be useful in burrowing. They commonly live under ground, through which they can burrow with great rapidity. The female forms a nest of clay, about as large as a hen's egg, and deposits in it nearly a hundred and fifty eggs, about the size of a grain of rice. These the mother defends with extreme vigilance; and some of her contrivances for the preservation of her offspring are very curious. Wherever a nest is situated, fortifications, avenues, and intrenchments surround it: there are also numerous winding passages which lead to it, and the whole is environed by a ditch, which presents an impassable barrier to most insects. They are very destructive in gardens, by dividing or injuring the roots of plants: but it appears that this is done less for nourishment than in making their burrows, as their principal food consists of insects and worms. The male has a chirp, or note of a low, jarring sound, which may be heard in the evening and night. At the approach of winter, the mole crickets remove their nests to so great a depth in the earth as to avoid any injury from the frost. When the mild season returns, they raise it in proportion to the advance of the warm weather, and at last elevate it so near the surface as to permit the sun and air to act on it. Their favourite residence is in hot-beds, where they occasion havock. In France, they are known under the name *courtilières*. (See White's *Natural History of Selborne;* and a paper by M. Feburier, *Nouv. Cours d'Agricult.*) No method has yet been discovered of preventing the depredations of these pernicious vermin. But as most of this kind of insects are averse to the smell of hog's dung, the use of this article would probably expel them from infested places.

MOLE; a mound or massive work formed of large stones laid in the sea, extended either in a right line or an arch of a circle, before a port, which it serves to defend from the violent impulse of the waves, thus protecting ships in a harbour. The word is sometimes used for the harbour itself. The Romans used it for a kind of mausoleum, built like a round tower on a square base, insulated, encompassed with columns, and covered with a dome.

MOLE, MATTHEW, president of the parliament of Paris, and an eminent statesman, was born in 1584. His father, also president of parliament, had distinguished himself by his prudence and courage in that station, during the troubles of the league; and the son gained not less honour during the disturbances of the Fronde. His integrity and fearlessness often resisted the arbitrary measures of the despotic Richelieu; and under the no less ambitious, but less vigorous Mazarin, he acquired the esteem of all parties. In 1614, Molé was named *procureur-général*, and, in 1641, first president of the parliament, through the influence of Richelieu, whom he had opposed in the process against the marshal de Marillac. The disturbances of the Fronde soon after commenced. In this contest of factions, Molé defended with equal prudence and sagacity, the interests of justice and freedom, as well as those of the court, and, when Paris became the theatre of tumults, conducted with so much firmness and dignity, that his bitterest enemies could not withhold from him their approbation; and even Condé and cardinal de Retz were forced to esteem him, although his unshaken rectitude, and devotion to the welfare of the nation and the safety of the throne, frequently frustrated their designs. At one time, indeed, wearied with the intrigues of the interested and ambitious, and unprotected by the feeble and wavering court, he voluntarily resigned the seals, and rejected the offer of a cardinal's hat for himself, and of the place of secretary of state for his son, by which Anne of Austria wished to idemnify him for the loss of his office. But he was soon obliged to resume the difficult station, and was more than once threatened with personal violence by the furious partisans of the Fronde, whom he overawed by his inflexible dignity. These unhappy disputes between the parliament, the court, and the leaders of the Fronde, did not cease until after Louis XIV. had assumed the reins of government: under his brilliant and artful despotism, the freedom of the parliament and of the nation perished together. Molé died in 1656. In the Memoirs of De Retz, and the other records of the time of the regency of Anne of Austria and Mazarin, Molé's influence in the troubled state is everywhere perceptible, and all voices agree that a better man could not have been at the head of affairs in that stormy period.

MOLECULE, in chemistry, is used to signify the constituent particles of bodies. Chemists have divided them into integrant molecules and constituent molecules. The former are such as have the same properties as the mass, and are therefore compound or simple, as the mass is one or the other. Thus a mass of pure metal consists of integrant molecules, each of which has the metallic properties of the mass. A mass of alloy, in the same manner, is composed of integrant molecules, each of which is compounded of the different substances forming the alloy. If we decompose a compound integrant molecule, we obtain the constituent molecules of which it consists. An integrant molecule of water is composed of constituent molecules of oxygen and hydrogen.

MOLES ADRIANI; the mausoleum of Adrian, in Rome, consisting of a square basement, of 170 feet in length, on which rises a round tower, 115 feet in diameter. In the wars with the Goths, it was used as a fortress, and the popes converted it into a castle, which received the name of *St Angelo*, from the statue of the archangel Michael on its summit.

MOLIERE, JEAN BAPTISTE POCQUELIN DE, the celebrated French comic writer, was born at Paris, Jan. 15, 1622. His father was *valet de chambre* and upholsterer to the king. In his fourteenth year he enjoyed the instructions of the Jesuits, and made great progress. Gassendi, Chapelle, Bernier, were his teachers. When his father had become debilitated, he had to discharge his office about the person of Louis XIII. In 1641, he accompanied the king to Narbonne. The French theatre had at that time begun to flourish, through the talents of the great Corneille, and the young Pocquelin, who had imbibed a strong passion for the stage, now formed a company of young persons of similar tastes, and exchanged his family name for that of *Molière*, either from regard to his parents, as his profession was then deemed disreputable, or in imitation of other actors, and resigned the office of his father. His company soon became distinguished. During the troubles of the Fronde, he is lost to our view; but after the restoration of order, we find him at the head of a strolling troop, which acted the *Etourdi*, at Lyons, in 1662. This is the first comedy written in verse by Molière. The truth of the dialogue, the inexhaustible skill of a valet, who is continually employed in rectifying the blunders of his master, the interest of the situations arising therefrom, have kept this piece on the theatre, notwithstanding the want of connexion between the parts, the coldness of the personages, and the incorrectness of the style. Molière gained equal applause as a poet and a dramatist, and drew all the spectators from another company at Lyons. Till that time, all the French pieces had been full of improbable intrigues. The art of representing character and manners on the comic stage was reserved for Molière. This art, the germ of which is seen in the *Etourdi*, united with variety of incident, kept the attention of the spectators awake, and concealed the faults of the piece. The *Etourdi* was acted with equal applause in Bezières. Here the prince of Conti, who had known Molière at school, had just assembled the estates of Languedoc. He received the poet as a friend, and intrusted him with the charge of amusing the town and the assembly. *Le Dépit Amoureux*, and *Les Précieuses Ridicules* were brought forward on the theatre of Bezières, and were admired. In the *Dépit Amoureux*, the incidents are better arranged than in the *Etourdi*. In the actions of the personages, a genuine comic vein is exhibited, and their language displays much spirit and humour; but the plot is too complicated, and the *denouement* not sufficiently probable. The plot in the *Précieuses Ridicules* is more simple. A delicate satire on the prevailing affectation of the character of *bel esprit* and of a romantic style, on the pedantry of learned females, and affectation in language, thoughts, and dress, is the object of this comedy. It produced a general reform when it was brought forward in Paris. The spectators laughed, recognised themselves, and clapped. Louis XIV. was so well pleased with the performances of Molière's company, that he made it his own company, and gave its director a pension of 1000 francs. The *Cocu Imaginaire* appeared in 1660. This piece also contains a fund of sportive humour, and keeps the spectators continually amused. Censure was not silent on its appearance, but was not listened to. *Don Garcie de Navarre*, in imitation of the Spanish, was criticised with more justice. It is a cold attempt at a more elevated style. The *Ecole des Maris*, the idea of which is drawn from the Brothers of Terence, contains a simple and entertaining plot, and a natural *denouement*. The theatre still resounded with the applause with which this piece was received, when, *Les Fâcheux*, projected, executed, and committed to memory by the actors, within a fortnight, was performed at Vaux, at the residence of Fouquet, intendant of finances, in the presence of the king and court. This comedy is almost destitute of plot, but the intention was to interest the spectators by the multiplicity of characters, the truth of the portraits, and by the elegance of the language. It is said that the king, on going away from the first performance, happening to see the count Soyecourt, a tiresome narrator of his exploits in the chase, said to Molière, "There is an original that you have not copied." In twenty-four hours, the scene of the hunter was inserted; and, as Molière was not acquainted with the terms of the chase, he requested Soyecourt himself to explain them to him. The *Ecole des Femmes* (1662) met with critics, who, overlooking the art which prevails in the management of the inferior personages, and in the natural and quick transition from one surprise to another, animadverted upon some negligences of style. Molière answered them by his spirited *Critique de l'Ecole des Femmes*. The *Impromptu de Versailles* was a reprisal, occasioned by an attack of Boursault, who had written a piece against him, entitled *Le Portrait du Peintre*. The court was very much pleased, in 1664, with *La Princesse d'Elide*, a comic ballet, prepared for an entertainment given by the king. Paris, which saw this ballet without the splendour which had embellished it at Versailles, received it less favourably. Another ballet, *Le Mariage forcé*, is drawn from Rabelais. *Don Juan, ou le Festin de Pierre*, excited much reprehension by the impiety of some of the expressions placed in the mouth of the profligate hero. Molière retrenched the objectionable parts in the second representation. *L'Amour Médecin* is one of the over-hasty works, which are not to be strictly criticised. It was written, studied, and represented within five days. In this piece, Molière, for the first time, attacks the physicians, which, it is said, he was induced to do by the fact that an ignorant and avaricious practitioner cheated him by overcharges. His great piece, *Le Misanthrope*, was but moderately well received at first, but, in the sequel, was justly considered as one of the finest productions of modern comedy. It must, nevertheless, be allowed that it has been more admired in the closet than it has pleased on the stage—the reason, Voltaire believes to be, because the plot is delicate and ingenious, rather than lively and interesting; because the dialogue, with all its beauty, does not always seem necessary, and therefore retards the action; and because the *denouement*, though skilfully introduced, leaves the spectator unexcited. He adds that the Misanthrope is a more delicate and a finer satire than those of Horace and Boileau, and at least equally well written, but that there are more interesting comedies, and that the *Tartuffe*, for example, unites the same beauties of style with a much more lively interest. In 1665, appeared the *Médecin malgré Lui*, a farce full of humour. *Le Sicilien, ou l'Amour Peintre*, is a short piece which pleases by its grace and gallantry. But his reputation was carried to its highest summit when the *Tartuffe* appeared. Weak minds and pretended saints cried out against the author; but the piece was played and applauded, after it had been kept back for years by the clamour. In this, hypocrisy is fully unveiled; the characters are equally various and true; the dialogue is elegant and natural; the *denouement* alone is unsatisfactory. An impious and obscene farce, entitled *Scaramouche*, having been represented at court, the king said to the great Condé, as he was leaving the theatre in his company, "I should like to know why the people, who are so much scandalized at Molière, say nothing about *Scaramouche*." "The reason is," replied the prince, "that *Scaramouche* ridicules only God and religion, about which these people care nothing, while Molière's piece ridicules themselves." In 1668, Molière published his *Amphytrion*, a free imitation of Plautus. With the exception of a tedious scene between Jupiter and Alcmene nothing can be more humorous. *L'Avare* (the Miser), an imitation of the *Euclio* of Plautus, is, in the leading character, a little overdone; but the multitude is only to be struck by strong traits. Rousseau censured this piece, because the paternal authority is undervalued in it. *George Dandin, ou le Mari confondu; Monsieur de Pourceaugnac; Les Fourberies de Scapin*, are rather amusing than instructive. *Le Bourgeois Gentilhomme*, though mixed with some buffooneries, is highly comic, and full of power. Molière bestowed more care on his *Femmes Savantes*, a witty satire on affected taste and pedantic learning, which at that time prevailed in the *Hôtel de Rambouillet*. The incidents are not all well connected; but the subject, dry as it may be in itself, is exhibited in a truly comic form. The development is admirable, and has been a hundred times imitated. The same is true of the *Malade imaginaire*, in which the quackery and pedantry of the physicians of the times are fully delineated. With this piece the author concluded his career. He was indisposed when it was performed. His wife and Baron urged him not to play: "What," he replied, "will all the poor workmen do? I could not forgive myself for neglecting, a single day, to give them bread."

The exertion with which he played produced convulsions, which were followed by a hemorrhage. He died after the lapse of a few hours, Feb. 17, 1673. The academy did honour to itself and Molière, in 1778, by erecting a bust of him, with the verse of Saurin:

> Rien ne manque à sa gloire; il manquait à la nôtre.

The archbishop of Paris at first refused him burial; but the king himself insisted on it, and he was interred in St Joseph.

Molière is the true father of the French comedy. His works may be considered as a history of the manners, fashions, and tastes of his times, and as the most faithful picture of human life. Born with an observing mind, skillful in catching the outward marks of the passions and emotions, he took men as they were, and, like a skilful painter, exhibited the most secret recesses of their hearts, and the tone, the action, and the language of their various feelings. "His comedies," says Laharpe, "properly read, may supply experience, because he has depicted not mere passing follies, but human nature, which does not change. Of all who have ever written, Molière is the one who has best observed men without seeming to do so. His knowledge of human character seems to have come by intuition. His pieces are as pleasing when read as when performed. Molière is a writer for those of ripened age and the gray-haired. Their experience corresponds to his observations and their memory to his genius." In his domestic relations, Molière was not fully happy: he who made merry on the stage with the weaknesses of other men, could not guard against his own weakness. A violent passion induced him to marry the daughter of the actress Bejart, and he thereby incurred the ridicule which he had so often cast on husbands of a disproportioned age. He was more happy in the intercourse of his friends; and the marshal Vivonne, the great Condé, and even Louis XIV., admitted him to a footing of intimacy. As an actor, Molière was not to be surpassed in high comic parts, such as Arnolphe, Orgon, Harpagon, &c. In 1773, Bret published an edition of his works at Paris (in 6 vols.), with interesting commentaries. See Pachereau's *Hist. de la Vie et des Ouvrages de Molière* (Paris, 1825.)

MOLINA, Juan Ignacio, a Jesuit, was born in Chilé, and, after a long residence in that country, was obliged to leave the Spanish territories, on account of the dissolution and expulsion of his order. Molina retired to Italy, and published, in Italian, his valuable Civil and Natural History of Chilé (Bologna, 1782 and 1787, 2 vols.); which has been translated into Spanish, French, German, and English (Middletown, Connecticut, 1808).

MOLINA, MOLINISTS. See *Jansenius*, and *Grace*.

MOLINOS, Michael. See *Quietism*.

MOLLA; a spiritual and judicial officer among the Turks, who has civil and criminal jurisdiction over towns or whole districts, and is therefore a superior judge, under whom are the *cadis*, or inferior judges. Over the *mollas* are the *cadileskers*, or supreme judges of the empire, who sit in the divan.

MOLLE (*soft*, or *sweet*); a relative term, used by the French, signifying a *flat sound*, that is, a sound which is half a tone lower than the sound with which it is compared,—as B flat, or B *molle*, is a semitone beneath B natural, or B *durum*. This term, as its sense intimates, is applied to the flat sounds on account of their supposed softness or sweetness, in comparison with the effect of the natural and sharp tones.

MOLLUSCA. We have already given a pretty full account of the rise and progress of the study of molluscous animals, under the article *Conchology*, which we treated as a distinct branch of Natural History.

Molluscous animals are comprehended in the second great division of the animal kingdom—animals without a backbone. They are destitute of an articulated skeleton or vertebral column. The nervous system is not developed in the form of a spinal cord, but simply into a certain number of medullary masses situated in different points of the body, the principal of which is called the brain, and is placed transversely on the œsophagus, and envelopes it with a nervous collar. The organs of sensation and motion have not the same uniformity in point of number and position as in the vertebrate animals, and a greater aberration is observable in the position of the heart and organs of respiration, as well as in the structure of the latter. Some species are formed for breathing elastic air, and others fresh or salt water. Their organs of locomotion, and others, which are external, are generally symmetrically arranged on the two sides of an axis.

The mollusca have a double circulation, their pulmonary system invariably describing a distinct circle. The function of breathing is always assisted by, at least, one ventricle, situated between the pulmonary veins and the arteries of the body, and not, as in fishes, between the veins of the body and pulmonary arteries. It is then an aortic ventricle. It is only the cephalopoda[*] that are provided with a pulmonary ventricle, which is subdivided. The aortic ventricle is likewise divided in some genera, as in the arca[†] and lingula.[‡] In some other bivalves, the auricle only is divided. When more than one ventricle exists, they do not consist of a single mass, as in warm-blooded animals, but are remote from each other.

The blood in molluscous animals is white, or bluish-white, and seems to contain a smaller proportion of fibrin than that of vertebrate animals. Cuvier supposes that the veins perform the functions of absorbent vessels.

The muscles in this class are attached to their skin by various points, forming, in those places, tissues which possess more or less density. Their motions consist of different contractions, varying in their direction, producing inflections and prolongations, together with relaxations of their several parts, by means of which they creep, swim, and seize upon such objects as the formation of these parts are adapted to. They are, however, incapable of rapid progress, their limbs not being supported by articulated and solid levers.

Most of the mollusca are possessed of great irritability, frequently continuing after they are cut asunder. Their skin is naked, extremely sensible, and usually covered with a mucous substance, which is secreted from its pores. No organ of smell has yet been detected in them, although they appear to possess that sense. Cuvier thinks it probable that the whole skin may be susceptible of distinguishing odours. All the *cephala*, *brachiopoda*, *cirripeda*, and part of the *gasteropoda* and pteropoda are destitute of eyes, while the *cephalopoda* enjoy them in as complicated a degree as the warm-blooded animals. The eyes are situated sometimes at the base, sometimes at the middle, and frequently at the extremity of the tentacula. The eye of the *Helix Pomatia* is represented pl. 60, f. 92, *e;* it is situated at a little to the one side of the rounded extremity, or papilla, *p*, of the tentaculum, and is attached to an oval bulb of a black colour. It receives only a slender branch, *o*, from a large nerve, *n n*, which is distributed to the papilla of the tentaculum, and appears to be appropriated exclusively to the sense of touch. The bulb, with the eye attached to it, is represented, in this figure, as half retracted within the tubular sheath of the tentaculum, *ss*. The cephalopoda are the only ones in which have been discovered the organ of hearing, and where the brain is enveloped in a kind of case of a cartilaginous consistence.

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[*] See article Conchology, Class I., Order II., p. 376.

[†] Ib. Class II., Order II., p. 379.

[‡] Ib. Order I., p. 378.

Almost all molluscous animals have a peculiar development of the skin, which covers their body, like a *mantle*, and has received that appellation. This process, however, is sometimes narrowed into a simple disk, or is tubiform, or hollowed into a sac, and in some cases it is divided and extended in the shape of fins. There are two distinct kinds of molluscous animals, namely, cephalous, or such as are provided with a head, and acephalous, or destitute of a head. These are again distinguished by such as are *naked* mollusca and *testaceous* mollusca, or with a shelly envelop. The naked mollusca have a membranous or fleshy mantle; which, however, has frequently one or more hard laminæ in its texture. These are increased in dimensions and thickness, by a deposit of earthy and animal matter combined; the new layers overlapping the old ones. When this substance remains concealed within the tissue of the mantle, the animals are called naked mollusca. The common field snail, (*Limax agrestis*, pl. 60, f. 5.) and the black snail, (*L. ater*, pl. 32, f. 25.) are examples of animals of this kind. More frequently however, this shelly matter becomes so greatly developed that the animal, in a state of repose, can contract itself within it; it is then termed a *shell*, or a *testaceous* animal, which is exemplified by the common garden snail shell. (*Helix aspersa*, pl. 60, f. 15.) The epidermis which covers these animals is very thin and sometimes desiccated, or of a woolly texture.

The variety of form, surface, colour, brilliancy, and substance is almost infinite. They are nearly all calcarious, although some are simply of a horny consistence; but in both cases they consist of matter deposited in layers, or exuded from the skin under the epidermis, in the same manner as the hardened mucous covering, nails, hairs, horns, scales, and even teeth. The shelly tissue differs according as its transudation is deposited either in parallel laminæ, or in close set vertical filaments.

Every mode of mastication and deglutition is illustrated in the mollusca; for we find their stomachs simple, complicated, and frequently provided with a peculiar armature; the alimentary canal is variously prolonged. Most species have salivary glands, and always a liver, but neither pancreas nor mesentery. Several have peculiar secretions.

Several of the mollusca are bisexual. Some produce their young alive, while others are oviparous. The eggs in some are covered by a shelly envelop, and others only by a simple viscosity.

The turbinated mollusca appear to be animals in a slight state of development; they possess but little industry, and are only preserved by their great fecundity, and extreme tenacity of life. They are all oviparous; their reproduction consequently depending on sexual impregnation.

Some genera of mollusca inhabit the sea and fresh waters, while others are entirely terrestrial: and a few species are amphibious, as may be exemplified in the *succinea, amphibia*, plate 17, f. 75.

They feed on all substances, both animal and vegetable; some will eat these even in a putrid state, while others will only consume them fresh.

The uses of this numerous class are extremely varied. Many of them are taken as food by man, and others supply nutritious prey for birds and fishes. Their shelly coverings are converted into many useful articles of commerce; and from the veins of certain species of shells called *purpura* is extracted the beautiful dye of the ancients, called Tyrian purple. The *P. lapillus* which is common on the British shores, adhering to stones, yields this dye; it is represented in pl. 60, f. 79. For a description and figures of the different parts of testaceous mollusca, see Conchology, Vol. II. p. 74, and pl. 19.

CLASS I.

CEPHALOUS MOLLUSCA,

OR SOFT ANIMALS WITH A HEAD.

Lamarck divides the turbinated testaceous mollusca into five orders, depending upon the complication of their internal organization. These are first :—

ORDER I.—HETEROPODA.

Destitute of arms arranged around the head; unprovided with a foot under the belly or throat for locomotion, but furnished with one or more irregularly set fins. See Conchology, Vol. II. p. 376.

The animals of this order are distinguished from all the other Mollusca by the form of their foot, which, in place of a horizontal disk, is compressed into a circular lamina, and is used as a fin, and on the edge of which, in several species, is a dilatation forming a hollow cone, representing the disk of the other orders. Their branchiæ are situated on the posterior part of the back, and composed of plumiform lobes, directed forward; immediately behind these are the heart, a small liver, with part of the viscera and internal organs of generation. Their bodies are of a gelatinous, transparent substance, lined with a muscular layer, elongated, and terminated by a compressed tail, in most species. There is a muscular mass belonging to the mouth, and the tongue is provided with little hooks; the œsophagus is very long; the stomach thin; on the right side of the visceral mass are two prominent tubes affording a passage for the fæces, ova, &c. They generally swim on their back, with the foot upwards. They possess the property of distending their body by filling it with water, in a way which is not yet properly understood.

Carnaria Cymbium, pl. 17. f. 1. Body elongated, gelatinous, pellucid, with a tail at its posterior termination, and provided with one or more unequal fins; heart and branchiæ united into one mass, which projects from the abdomen and is situated near the tail, and inclosed in a shell; head distinct, with two tentacula; two eyes, and a contractile elongated mouth.

ORDER II.—CEPHALOPODA.

Lower part of the body enveloped in a bag-shaped mantle, with the head issuing from the sac, and having inarticulated arms, to which are attached cups, surrounding the mouth of the animal, which is furnished with two horny mandibles.

The mantle unites under the body; in several species the sides are extended into fleshy fins; head projecting from the sac, is provided with two large eyes, and crowned with longer or shorter fleshy arms or feet, capable of motion in all directions, their surface provided with cup-shaped suckers, by means of which they can adhere firmly to other bodies; these feet are used for prehension, natation, and walking. They swim with the head behind, and crawl in all directions, with the head under the body. At the opening of the sac in front of the neck is placed a fleshy funnel as a passage to the excretions. See Conchology, Vol. II. p. 376.

Division I.—Cephalopoda Sepiaria.

Loligo vulgaris. Medium cuttle-fish, pl. 32. f. 6. With a fleshy depressed body contained in a bag, which in most species is obtuse behind and margined on both sides through their whole length by a narrow fin; within the body, and near the back is included a free, calcarious, spongy, and opaque bone; mouth terminal, surrounded with ten arms provided with cups, of which two are longer than the rest, and placed on peduncles.

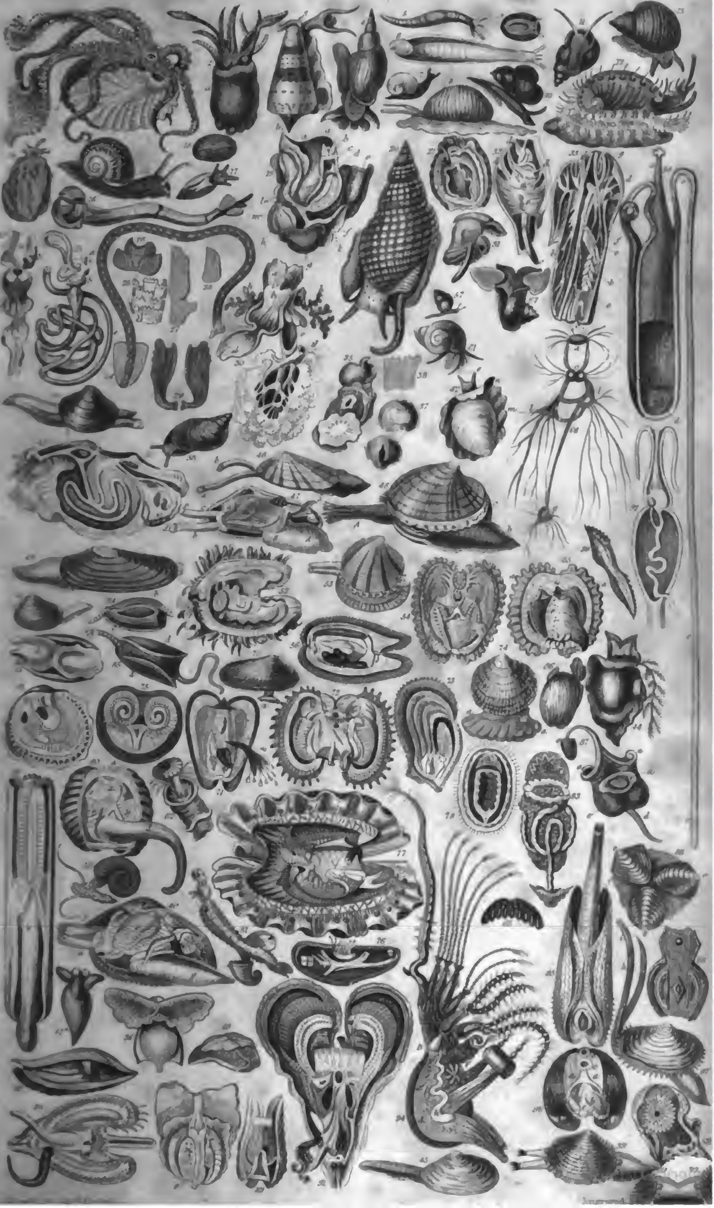
Division II.—Cephalopoda Monothalama.

Shell unilocular, entirely externa., and enveloping the animal.

Argonauta Argo. Paper Nautilus, pl. 17. f. 2. and pl. 60. f. 1. The arms have two rows of cups, the pair of feet nearest the back are dilated at the extremity into a broad membrane. The body of the animal does not penetrate to the bottom of the volutions of the shell, and there is no visible muscular attachment, so that it appears not to be a permanent resident. The two membranous arms are frequently elevated by the animal, by way of sails, and with three other tentacula thrown

MOLLUSCA

PLATE LX.



over each side of the shell, and acting as oars, the animal frequently sails on the surface of the water, like a little vessel.

Division III.—Cephalopoda Polythalama.

Family I.—Ammonacea.

Septa sinuous, lobed and cut at the margin, meeting together upon the inner wall of the shell, and articulated by jagged sutures.

Shell multilocular, partly or entirely internal, and inserted in the posterior part of the body.

All the species of this division are fossil, for the generic characters see Organic Remains.

Family II.—Nautilacea.

Shell disciform, with a central spine, and short cells, which do not extend from the centre of the circumference.

Nautilus Pompilius. Pl. 17. f. 3, and pl. 60. f. 63. The animal, according to Rumphius, is partly contained within the last cell, has the sac, eyes, parrot-beak, and funnel of the other Cephalopoda; but the mouth, in place of having their large feet and arms, is surrounded by several circles of numerous small tentacula, which are destitute of cups; a ligament arising from the back traverses the whole siphon and fastens it there. The other genera are fossil. See Organic Remains.

Family III.—Radiolacea.

All the genera are fossil. See Organic Remains.

Family IV.—Spherulacea.

Fossil, except one species found near Corsica, which is so minute that the animal has not been ascertained. See Organic Remains, plate 66.

Family V.—Cristacea.

All the species are fossil. See Organic Remains, pl. 66.

Family VI.—Lituolacea.

Shell partially spiral; the last volution continued in a straight line.

Spirula Peronii. Pl. 17. f. 4. Animal a cephalopode, pl. 60. f. 2. The body or that part which inhabits the shell, *a*.

Family VII.—Orthocerata.

Animals of the genera unknown. See Conchology, Vol. II. p. 376.

ORDER III.—TRACHELIPODA.

Body usually spirally convoluted, and separated from the foot, which is free, flat, and attached to the neck at its base for the purpose of locomotion; the body always enveloped by a spiral shell.

SECTION I.—ZOOPHAGOUS TRACHELIPODA.

Family I.—Involuta.

Shell destitute of a canal, but with the base of its aperture notched or effuse, and its volutions broad, compressed, and rolled up in such a manner, that the last nearly covers all the others.

Conus generalis. Pl. 60. f. 3. The thinness of the animal is proportioned to the narrowness of the aperture through which it passes; its tentacula and proboscis are highly protractile; the eyes are situated on the outer side of the former, and near the point; the operculum placed obliquely on the hind part of the foot, is too narrow and short to close the whole of the aperture. It has a narrow mantle and tube situated above the head, by which the water gains admittance to the respiratory organ.

Cypræa Europea. Pl. 60. f. 8. The proboscis is deep vermilion coloured; the tentacula yellowish red, spotted with yellow; the upper part of the foot streaked longitudinally with yellow and brown; and the mantle greenish brown, edged with brownish red.

Buccinum undatum. Pl. 60. f. 19, 20. The extracted animal; *a a*, the foot; *b*, the head; *c*, a kind of platform raised above the thoracic cavity, on which the point of the boring trunk rests. This organ is represented at f. 31. *d*, the cavity of the thorax; *e*, the mantle; *f*, the rectum; *g*, the stomach; *h*, the heart, thrown below, and to the right side of its natural situation, to allow the opening of the tube to be seen; *i*, the respiratory trunk; *k*, the organs of the muscles of the boring trunk; *l*, the course of the tube by which the foot is supplied with water; *m*, its termination.

Family II.—Columellaria.

No canal at the base of the aperture, but a subdorsal notch more or less apparent, and fold upon the columella.

Voluta Scapha. Pl. 17. f. 14. The animal has a large thick and fleshy foot, and the head is provided with a vail from the sides of which issue the tentacula; the proboscis is rather long, and there is an appendage on each side of the base of the siphon. When the proboscis is extended, it can bend in all directions, by means of the retractor muscles, acting with opposing forces. This interesting mechanism is illustrated by fig. 32, wherein the proboscis is represented retracted about a half; the external cylinder, *a*, is seen enveloping a portion of the inner one, *b*, the point of which *c* is the termination of the proboscis; the muscles which draw it within the body, *d d*, are in a state of contraction, and at *e* is represented the great annular muscle, which pushes forward the inner cylinder, and consequently lengthens the organ.

Family III.—Purpurifera.

Shell with a short canal ascending posteriorly, or with an oblique notch at the base of its aperture, directed backwards. They are all operculate.

Purpura lapillus. Pl. 60. f. 79. With two slender retractile tentacula, on which are placed the eyes. A vascular reservoir near the stomach yields a colour similar to the famous Tyrian purple.

Family IV.—Alata.

Shell with a greater or less canal at the base of the aperture, of which the right lip changes its form as the animal advances in age, and has a sinus at the lower part.

Strombus Succinctus. Pl. 17. f. 28.

Family V.—Canalifera.

Shell with a canal more or less long at the base of the aperture, and of which the right margin does not change its form as the animal advances in age.

Murex acanthopterus. Pl. 17. f. 32. The animals of each sub-genus are furnished with a proboscis; long approximate tentacula, on the external side of which are the eyes; and a horny operculum; they are destitute of the veil on the head; and the want of the siphon excepted, resemble the animals of the Buccina.

SECTION II.—PHYTIPHAGA.

Destitute of projecting siphon, and respiring generally by an orifice; furnished with jaws, and feeding on vegetables, shell with the aperture entire, and without any notch or canal. Many of the species live upon land, and respire air, while others inhabit fresh water, either stagnant or running. Many are marine. Some families are furnished with an operculum attached to the foot of the animal.

Family I.—Turbinacea.

Shell turreted or conoid, having an oblong or rounded aperture, not widened, and the margin disunited.

Turbo smaragdus. Pl. 17. f. 45. The animal has two long tentacula; and the eyes placed on peduncles at their external base; the sides of the foot are provided with membranous wings, sometimes simple, at others fringed, and occasionally furnished with one or two filaments.

Turbo littoreus. Pl. 60. f. 11. Animal striped with black; provided with two tentacula, which are setaceous, not quite round, with black annulations; eyes prominent, situate at the base of the tentacula.

Family II.—Scalarides.

Shell devoid of plicæ or folds on the columella; the margins of the aperture are united in circular forms.

Scalaria coronata. Pl. 17. f. 51. The tentacular organs of generation are long and slender, terminating in a setaceous filament; the eyes are situate at the base of these filaments.

Family III.—Plicacea.

Shell with the aperture not widened, and folds on the columella.

Tornatella flammid. Pl. 17. f. 54.

Family IV.—Macrostoma.

Shell auriform, with the aperture very wide, and the margins disunited; destitute of columella and operculum.

Haliotis tuberculata. Pl. 17. f. 55, and pl. 60. f. 12. The animal is one of the most highly ornamented of its order. A double membrane, cut into bands and provided with a double range of filaments, extends, at least in the more commonly known species, round the foot and on the mouth; outside its long tentacula are cylindrical pedicles which support the eyes. The mantle is deeply cleft on the right side, and the water which passes through the shell, penetrates this canal into the branchial cavity; along its edges three or four filaments are observable, which the animal has the power of protruding through these holes; the mouth is in the form of a short proboscis.

Sigaretus Haliotoideus. Pl. 60. f. 42. Shell concealed in the mantle; *m*, the membranous shield under which the shell is concealed; *n*, a sinus through which an arm is sometimes protruded; *o*, the tentacula, at the base of which the eyes are placed.

Family V.—Ianthenia.

Shell gibbous, conoidal, thin, transparent; aperture triangular, columella straight; surpassing the base of the right margin: destitute of an operculum.

Ianthena exigua. Pl. 17. f. 59. The animal is destitute of an operculum, but the under surface of its foot is provided with a vesicular organ resembling a foamy bubble, but which is, in fact, composed of a solid substance, which prevents it from crawling, but enables it to float on the surface of the water; the head is provided with a cylindrical proboscis, terminated by a vertically cleft mouth, and armed with little hooks, and is furnished with a bifurcated tentaculum on each side.

Family VI.—Neritacea.

Shells semiglobular or oval, destitute of a columella; and the left margin edged and transverse; provided with an operculum; inhabit fresh waters and the sea.

Natica monilifera. Pl. 60. f. 35. A front view, with tentacular head and mantle reflected; *c*, the head; f. 37, a view of the head from beneath: f. 38, one of the cartilaginous jaws.

Neritina fluviatilis. Pl. 60. f. 18. The foot in the animal is shorter than the shell; the head cylindrical and notched by a furrow, and provided with two long pointed tentacula, with the eyes sessile at their base.

Family VII.—Peristomida.

Shell conoid or sub-conoid with an operculum, and the margins of the aperture united. All the species are fluviatile, the animals respiring in water.

Paludina impura. Pl. 60. f. 11. The animal has two linear subulate tentacula, with eyes at their base; the mouth triangular; the foot sub-triangular; and the branchiæ composed of tufted filaments.

Valvata piscinalis. Pl. 60. f. 61.

Family VIII.—Melanides.

The margins of the aperture disunited; and the right one edged; animal provided with two tentacula.

Pirena Madagascarensis. Pl. 17. f. 67.

Family IX.—Lymnæcea.

With an oblong acutely tapering spire, generally smooth on the external surface, and having the outer margin of the aperture always acutely edged, and not reflected. Animal amphibious, generally destitute of an operculum; and the tentacula flattened.

Lymnæa stagnalis. Pl. 60. f. 4. The animal provided with two compressed, broad triangular tentacula, near the base of whose inner edge the eyes are situated. They feed on plants and seeds, and their stomach is a very muscular gizzard, preceded by a crop.

Family X.—Colimacea.

Shells acutely spiral, with no projecting parts on their exterior, except the markings of their periodical additions; the right margin of the aperture frequently reflected outwards; the tentacula are cylindrical, and usually four in number, but two in others: and destitute of operculum. They are terrestrial animals.

Cyclostoma elegans. Pl. 60. f. 10. The animal is provided with two cylindrical tentacula terminated by blunt tubercles, with eyes situated at their external base, placed on two obtuse tubercles; and provided with a horny operculum instead of branchiæ. The animal has merely a vascular network spread over the parietes of its pectoral cavity. See article Conchology, Vol. II. p. 376.

Succinea amphibia. Pl. 60. f. 58. With four tentacula, two short and two longer, at the tips of which are placed the eyes; each of the tentacula are furnished with a ring near the middle, below which they are thicker to the base.

Pupa sexdentatus. Pl. 60. f. 57

Helix aspersa. Pl. 60. f. 15.

ORDER IV.—GASTEROPODA.

Body never spiral, destitute of any shell, provided with a muscular foot attached its whole length under the belly, for the purpose of locomotion.

Some of the animals of this division are naked, and destitute of any calcarious covering; others are provided with a dorsal plate; and a third series have a shell which is more or less concealed in their mantle. The animals of this order are limited by Lamarck to those whose bodies are straight, and never spirally convoluted, and which are provided with a muscular disk or foot, united to the body nearly its whole length.

SECTION I.—PNEUMOBRANCHIÆ.

Branchiæ in the form of a vascular net on the wall of a particular cavity, opening by a hole, which the animal contracts and dilates at pleasure.

Family I.—Limacinæ.

Branchiæ in the form of a vascular net on the partition of a particular cavity, the aperture of which the animal can contract or dilate at pleasure. The body of the animals is elongated, and they crawl by means of a ventral disk bordered on the sides by a very narrow mantle.

Vitrina beryllina. Pl. 60 f. 7. The body of the animal is too large to be completely drawn within the shell; the mantle is provided with a double border, the upper one, which is divided into several lobes, extends considerably beyond the shell, and being reflected over it polishes it by friction.

Testacella Scutulum. Pl. 60. f. 6. Body oblong, with a shell at the posterior extremity; four tentacula; the eyes placed in the longest pair; anal opening at the posterior extremity.

Limax ater. Pl. 32. f. 25. Body black, rounded above and rugous towards the tail.

Onhidium Typha. Pl. 32. f. 7. Body oblong, and margined on both sides by the mantle; tentacula two, cylindrical and retractile; mouth without jaws, and with two annular appendages.

SECTION II.—HYDROBRANCHIÆ.

Family II.—Laphysiacea.

The branchiæ are situated in a particular cavity towards the posterior part of the back, and covered by an opercular scutellum; they are provided with tentacula. The animals of this family resemble large snails, but have a thicker body, and are broader towards the posterior part, and have a larger margin to their mantle; the head projects, and is provided with four tentacula, two of which are placed near the mouth, and the other two more behind. The branchial scutellum is corneous or cretaceous.;

Dolabella callosa. Pl. 17. f. 88. Body oblong, narrowed before, widened posteriorly with the borders of the mantle folded over the back; provided with four semitubular tentacula set in pairs; branchial operculum inclosing a shell; anal opening situated near the branchiæ.

Laphysia deplians. Pl. 32. f. 8. pl. 60. f. 17. Body oblong convex, with a large mantle bordering it on each side, which covers the back while in a state of repose; head with a neck attached; and with four tentacula disposed in pairs; branchial operculum inclosing a shell; anal opening placed on the back, near the branchiæ.

Family III.—Bullacea.

Head very indistinct: the branchiæ are situate in a particular cavity, towards the posterior region of the back, and covered by a mantle; they are destitute of tentacula, and branchial operculum. Some species are unprovided with either exterior or interior shell; and in others the shell is completely concealed in the mantle; and there are several which have an external shell attached by a muscle.

Bulla hydatis. Pl. 60. f. 86. Body oblong ovate, slightly convex, divided into two transverse portions, with the mantle folded posteriorly; branchiæ covered; anal opening on the right side; body behind covered with a shell. This figure exhibits the back of the shell, with the lateral fin-like membranes protruded *a*. F. 87. The gizzard magnified. *a, a, a,* the tips of the plates covered by a thin membrane, and surrounding a muscular integument, thickened at the upper part *b*; the part attached to the mouth *c*, with the œsophagus communicating with the gizzard; *d*, the intestinal canal. F. 88. The gizzard laid open at its anterior end, showing the three corrugated corneous plates *e e e*, with their connecting ligaments *f*, magnified.

Bulla aperta. Pl. 60. f. 83. Lateral lobes of the foot thickened and reflected upwards; head indistinct; destitute of tentacula; branchiæ dorsal; shell concealed in the mantle, *a*. f. 84, the gizzard composed of three testaceous plates, showing the smaller plate *b*, with the connecting ligament *c*. f. 85, another view of the gizzard, showing the two larger plates *d d*, with their connecting ligaments; *e*, the gullet; *f*, the alimentary canal.

Family IV.—Calyptracea.

The branchiæ are situate in a cavity on the back near the neck, and projecting beyond or included in the cavity; shell always placed exteriorly.

Ancylus fluviatilis. Pl. 60. f. 9. Body covered by a shell; two compressed slightly truncated tentacula, with the eyes situated at their internal base; the foot short and elliptical, a little narrower than the body. They are small animals, and found on aquatic plants in slow running streams or lakes.

Family V.—Semiphyllidiacea.

The branchiæ are situated under the margin of the mantle, and disposed in a longitudinal series on the right side of the body; respiring in water.

Pleurobranchus plumula. Pl. 60. f. 14. Animal with an oval fleshy body, covered by a mantle; the foot is broad, and equally margined; the branchiæ are placed on the right side, situate in a canal; mouth anterior and placed below in the form of a proboscis; two cylindrical tentacula, which are longitudinally cleft on the external side. Shell internal, thin and obliquely flattened, and lodged in the back.

Pl. 60. f. 22. Alimentary canal; *a* the first stomach; *c* the second stomach; *d* the third stomach; *e* the fourth stomach. The œsophagus dilates into a membranous crop *a*; at the lower part of which, *b*, the bile is poured in. It communicates by a narrow cardia with the second stomach *c*, which is a gizzard with thin but muscular parietes. The third stomach *d*, is membranous, and precisely resembles the plicated stomach of ruminants, in being disposed in large but delicate folds, by means of which the alimentary matter contained in it is moulded into long whitish cords. The fourth stomach *e*, is membranous, like the crop, but smaller. It is remarkable that the gizzard contains a narrow groove, running through its whole length, leading from the first to the fourth stomach, and probably subservient to a species of rumination.

F. 44. Another view of the animal; *g*, its protracted foramen; *h h*, the lower lamina, or border of the sustentaculum; *i*, the upper lamina, under the middle of which the shell is concealed; *k*, a plumose feeler; *l*, the tentacula, at the base of which the eyes are placed.

Family VI.—Phyllidiacea.

The branchiæ are situate under the margin of the mantle, and disposed in a longitudinal series around the body. The animals all respire in water.

Patella vulgata. Pl. 60. f. 21. The body is entirely covered by a shell; the head provided with two pointed tentacula, and the eyes situate at their exterior base; the branchiæ are disposed round the body, under the margin of the mantle; the anal opening and generative organ on the right anterior side; shell univalve, concave, conical, and simple, without a spire.

F. 23. The alimentary canal. *a*, the mouth; *b*, the buccal mass; *c*, the tongue; *d*, the stomach; *e e*, the intestine. F. 24 represents the tongue of the patella of its natural size; f. 25. is a portion magnified; f. 26, 27, and 28, are the cartilaginous jaws. This tongue is a narrow riband-shaped body, near three inches long, of almost equal breadth throughout, except at the apex, where it is soft and somewhat dilated; the surface roughened with three rows of teeth, the side rows alternating with the middle one, which is quadrifid, while the side teeth are divided only into two points. There are also placed along each side a double row of cylindrical tubes, whose apertures look towards the base. This curious spinigerous tongue is never protruded beyond the margin of the lips. It seems to be used for rasping down the food; and, in proportion as the anterior prickles are worn away in this operation, and absorbed, another portion of the tongue is brought forward to supply its place: but that there may be no deficiency in its length, we find the apex soft and vascular, where in fact a continual growth and additions are going on.

Chiton cinereus. Pl. 60. f. 78. The head anterior, sessile with the mouth below; destitute of tentacula or eyes; branchiæ disposed around the body, under the margin of the skin; anal opening at the posterior extremity. F. 93. The animal extracted. *a a*, the ventre; *c c c*, the intestinal canal; *e*, the anal opening; *d d d d*, the liver; *f*, the ovarium.

Family VII.—Tritoniacea.

The branchiæ are placed exteriorly, and situated above the mantle on the sides or on the back. The animals respire in water.

The animals of this family are distinguished from those of the other Gasteropoda, by the situation of their branchiæ, which are all exterior; in several genera these appear to be a degeneration of the mantle, or to be formed by portions of it having become branchial; the body is always destitute of a shelly covering, and neither have they one internally. All the animals inhabit the sea.

Doris argus. Pl. 32. f. 9. The body oblong, plain, convex, or subprismatic, bordered all around by a membrane extending to each side of the head; mouth placed anteriorly and below; four tentacula, two of which are situate in a hollow on the body, and the two others near the mouth; anal opening near the base of the back, surrounded by projecting, laciniated and fringed branchiæ; generative aperture on the right side. See Conchology, Vol. II. p. 378.

Tethys leporina. Pl. 60. f. 30. The alimentary canal. *a*, the proboscis; *b*, the œsophagus; *c*, the stomach; *d*, the intestine; *e*, the hepatic duct; *f*, the liver; *g*, the hepatic artery; *h h*, salivary glands—the parts are laid open.
F. 29. The horny jaws of a *Tritonia*.

ORDER V.—PTEROPODA.

Destitute of any shell, foot, or arms, either for locomotion or seizing their prey; but provided with two opposite and similar fins, fitted for swimming.

The animals of this order are provided with two opposite fins; they are mostly of a small size, and either destitute of appendages, or having very short ones, situate at the head; some species are provided with a thin cartilaginous or horny shell.

Hyalæa tridentata. Pl. 60. f. 36. Body enveloped in a shell, with two opposite retractile fins inserted at the sides of the mouth; head indistinct; mouth terminal at the junctions of the fin; destitute of eyes; branchiæ lateral.

CLASS II.

ACEPHALOUS MOLLUSCA,

OR SOFT ANIMALS DESTITUTE OF A HEAD.

The second great division of testaceous Mollusca, consists of animals which are destitute of any apparent head, and have been denominated by Lamarck, Conchifera. Their mouth is concealed in the bottom, or between the folds of their mantle, which is usually doubled and incloses the body, in the same manner as a book is clasped over by its cover; but it often happens, that, in consequence of the two lobes uniting before, it forms a tube; sometimes it is closed at one end, and then it represents a sac. The mantle is generally covered by a calcarious, testaceous bivalve shell united by a hinge or ligament, and in some instances the shell is multivalve; in two genera, however, it is only of a cartilaginous or membranaceous nature. The animal is always attached to this shelly covering by strong muscles, by means of which it can open or close the sides of its covering at pleasure. The brain is situated over the mouth, where one or two other ganglia are observable. The branchiæ or gills, generally consist of large lamellæ covered with vascular meshes, under or between which passes the water; and are more simple in those genera which are destitute of a shell. The leaflets of which the branchiæ are composed are generally crescent-shaped, placed on each side of the cloak, covering the abdomen of the animal upon the sides of which they are attached in pairs; they are formed of a tissue of small vessels arranged close together, like the pipes of an organ. From these branchiæ the blood proceeds to the heart, which is placed towards the back, is very small, but provided with venous and arterial vessels. The liver is extensive, and embraces the stomach and the greater proportion of the alimentary canal.

The mouth is always devoid of teeth, and is capable of only receiving the molecules, conducted to it by the water; at each side of the mouth are four thin triangular leaflets, which are the extremities of the lips. Some species are provided with two stomachs.

The whole animals of this division fecundate themselves, and in many of the species, the young ones are extremely numerous, and pass some time in the thickness of the branchiæ before quitting the parent. The whole acephala are aquatic animals.

The foot of the animal when it exists is a mere fleshy mass, the motions of which are effected by a mechanism analogous to that which acts on the tongue of the mammalia.

The Conchifera of Lamarck are separated into two orders as follows:—

ORDER I.—MONOMYARIA.

With but one internal muscle of attachment, and the shell marked interiorly with one subcentral muscular impression.

SECTION I.

Ligament none, or at least unknown, or replaced by a tendinous cord, which supports the shell.

Family I.—Brachiopoda.

With two opposite ciliated arms, placed near the mouth, rolled up in a spiral form when the animal is in a state of repose; mantle provided with two separate lobes before, which envelop the body. Shell bivalve, adhering directly, or by means of a tendinous cord to marine substances.

Lingula anatina. Pl. 18. f. 1. The shell is elevated on a fleshy tendinous peduncle and fixed to marine bodies.

Family II.—Rudista.

Nothing is known of the animal, nor of the ligament and hinge of the shell; the valves are very unequal; and no distinct hooks are visible.

Crania personata. Pl. 60. f. 75.

SECTION II.

Ligament not marginal, but inclosed in a hollow space under the beak, always perceptible, and never forming a tendinous cord under the shell.

Family I.—Ostracea.

Ligament interior, or at least partly so; shell irregular, foliaceous, and sometimes papyraceous. The animal has neither foot, arm, nor projecting siphon.

Anomia ephippium. Pl. 60. f. 41.
Ostrea Edulis, the Edible oyster, pl. 60. f. 73. The animals of this genus, of all others, appear to possess faculties, the lowest in the scale of animal existence. Many are fixed to rocks, or other bodies under water, and therefore are incapable of seeking food, and are entirely dependent upon such as is carried to them by the motion of the water.

Family II.—Pectenides.

Ligament either interior, or partly so, being discoverable in some through an opening in the joint; shell in general regular, compact, and not foliaceous. Some genera fix themselves to marine bodies, by a byssus, while in others the lower valve is immovably attached; and many of the pectens are at liberty.

Spondylus gæderopus. Pl. 60. f. 50. *d e*, the branchiæ; *b*, the mouth; *g h i*, the abdomen; *k*, the great adductor muscle.
Pecten Jacobæus. Pl. 60. f. 77. *a b c d*, the two lobes of the mouth; *e e*, the byssus; *f f*, the abdomen; *x*, the intestinal canal; *g*, the mouth, ornamented with a fringe; *h*, the great adductor muscle. The animals of this genus possess considerable powers of locomotion, which was well known at the time Aristotle wrote. They have the power of removing themselves from one place to another, on dry land, by successive leaps. This has been fully established by recent experiments. A basket filled with the *Pecten opercularis*, or common edible scallop, has been placed on the sea shore, near the edge of the water, when all the individuals have speedily found their way to the sea. They have but a small oval foot placed on a cylindrical pedicle, between a sac-like abdomen that is suspended between the branchiæ. Some species swim with rapidity by suddenly opening and closing their valves. The mantle is surrounded by two ranges of filaments, several of the external ones being terminated by a little greenish globule. The mouth has numerous branched tentacula instead of the four usual labial leaflets.
Lima squamosa. Pl. 60. f. 72. The mantle is provided with numerous filaments of different lengths, but destitute of tubercles, and more internally, with a large border which closes the opening of the shell, and even forms a veil in front. The foot is small, and the byssus minute. The limæ swim with great rapidity, by opening and closing their valves.

SECTION III.

Ligament marginal and elongated.

FAMILY I.—MALLEACEA.

Ligament marginal, sublinear, and either simple or interrupted by crenulations; shell foliaceous or more or less inequivalve.

Avicula Tarentina. Pl. 60. f. 90. *a b c d*, the mantle, the duplicate of which contains the ovarium, *f f g g*; the byssus, *h i*; the abdomen, *k*; *s*, the anal opening.

FAMILY II.—MYTILACEA.

Hinge with a sub-interior ligament, which is marginal, linear, and very entire, occupying a great part of the anterior border; shell but seldom foliaceous. Nearly the whole of this family attach themselves to marine bodies by a byssus. They have a tongue-shaped foot, by the aid of which they attach their byssus to extraneous substances.

Pinna nobilis. Pl. 60. f. 91. *a, b, c, d*, lobes of the mantle; *gg, hh*, adductor muscles; *x f*, part of the abdomen. The animal is elongated like its shell; it is destitute of projecting siphons, and has a conical foot; the mantle is close along the side of the ligament; the foot resembles a small tongue excavated by a sulcus, and is provided with a small transverse muscle situated at the acute angle formed by the valves, near which is the mouth. By the side of the vent, which is behind this large muscle, is a conical appendage, peculiar to the genus, susceptible of expansion and elongation, the use of which is unknown.
Mytilus edulis. Pl. 60. f. 71.

FAMILY III.—TRIDACNITES.

The shell is transversely equivalve, with the muscular impressions situated under the middle of the upper margin, and prolonged on each side; the mantle is close and perforated by three holes, through one of which passes the foot; the second furnishes an entrance and exit for the water requisite for respiration; and the third is a passage for the excretions; the two latter not being prolonged into tubes as in the Mytilacea.

Tridacna gigas. Pl. 60 f. 61. The animal is very singular, and unlike most others of this class, being pressed out of the shell in front instead of being placed within the valves. The anterior side of the mantle is widely opened for the passage of the byssus; a little below the anterior angle is another opening which transmits water to the branchiæ, and in the middle of the inferior side is a third and smaller one which corresponds to the vent, so that the posterior angle transmits nothing and is only occupied by a cavity of the mantle open at the third orifice. There is but a single transverse muscle corresponding to the middle of the valves.
The tendinous byssus by which these gigantic shells—sometimes weighing 300 pounds—attach themselves to rocks, is so thick and strong that an ax is required to sever it. Nearly allied to this species is *Tridacna squamosa*, pl. 18. f. 27.

ORDER II.—DIMYAIRA.

Shell having two distinct and lateral muscular impressions, which are deep and widely separated, being placed near the lateral extremities of the valves.

SECTION I.

Shell always inequivalve and irregular.

FAMILY I.—CHAMACEA.

Shell inequivalve, irregular, and adherent; with two separate muscular impressions; ligament placed externally; the animal provided with short, separate siphons.

Chama gryphoides. Pl. 60. f. 54.
Chama antiquata. Pl. 60. f. 55. *ab*, the lobes of the mantle; *c*, the abdomen; *dd*, the foot.

SECTION II.—LAMELLIPEDES.

FAMILY I.—NAYADES.

This family consists of fresh water shells; the hinge sometimes provided with an irregular, simple, or cleft tooth, and a longitudinal prolonged one; sometimes destitute of any; or is furnished in its whole length with irregular granular tubercles; the posterior muscular impression compound; and the umbones often decorticated; the muscular impressions are lateral and distant, that of the posterior side being composed of two or three distinct, unequal impressions; the animal is destitute of any projecting tube or siphon; the foot is elongated, transverse, and rounded, which it protrudes between the valves, and uses to change its position.

Anadonta cygnea. Pl. 60. f. 43. *a*, the mouth, into which a bristle has been introduced; *b*, the stomach, under which the intestine makes five turns in the foot amidst the ovary, and then as it returns, runs posteriorly along the back of the animal beneath the hinge, and above the respiratory organs, passing through the midst of the heart, *c*, and opening at *d* above the posterior muscle closing the shells, beneath the small tube of the cloak. This description applies generally to most trivalves, but in the oyster the rectum does not pass through the heart.
Unio pictorum. Pl. 60. f. 49. The animal has two tubiform openings formed of the posterior extremity of the mantle, and furnished with numerous and small tentacula; it has no byssus; foot large, rounded and muscular; it is hermaphrodite and produces its young alive. Lives in mud, at the bottom of lakes and rivers.

FAMILY II.—TRIGONACEA.

Primary teeth of the shell lamelliform, and striated transversely; ligament exterior.

Castalia ambigua. Pl. 18. f. 35.

FAMILY III.—ARCACEA.

Primary teeth of the shell small, numerous, and disposed in a line on each valve of the shell, either in a straight or interrupted series. The valves do not close perfectly in the centre, in consequence of having a horny plate or fillet placed before the abdomen of the animal, that serves as a foot, and by which it adheres to submerged bodies.

Arca Noæ. Pl. 60. f. 59.
Arca barbata. Pl. 60. f. 70. *a*, the foot.
Pectunculus Pilosus. Pl. 60. f. 56.

FAMILY IV.—CARDIACEA.

Primary teeth of the shell irregular, both in their form and situation, and having generally one or two lateral teeth. In the animal, the mantle is open before, and there are besides, two separate apertures, one for respiration and the other for the fæces, which are prolonged in tubes, sometimes distinct, and at others united in one single mass. There is always a transverse muscle at each extremity, and a foot generally used for locomotion. Those which are provided with long tubes always live in ooze or sand.

Isocardia cor. Pl. 60. f. 98. In all the species the ligament of the shell is exterior, and very short; two distinct muscular impressions. The animal is furnished on each side with two unequal tubes, ciliated at their orifices, and on the other side with a large muscular foot.
Cardium rusticum. Pl. 60. f. 60. *a e*, the tracheæ; *a*, part of the abdomen; *bb*, the branchiæ; *c*, the adductor muscle.

FAMILY V.—CONCHACEA.

Shell with three primary teeth, at least in one valve, and the other with a similar number, or less in some species; sometimes provided with lateral teeth. The animal has generally two tubes or siphons projecting from its mantle, one of which answers the purpose of a passage for the water to the branchiæ, and the other for dejected matters; the foot is lamelliform. All the animals of this family inhabit sand or mud.

Subdivision I.

Generally destitute of lateral teeth; inhabiting the ocean: siphons of the animal elongated and unequal; the foot broad and projecting.

Venus Verrucosa. Pl. 60. f. 39.
Chytherea Chione. Pl. 60. f. 48.
Exoleta orbiculata. Pl. 60. f. 53.

Subdivision II.

Fresh water shells covered with a spurious epidermis, and having lateral teeth.

Cyclas cornea. Pl. 60. f. 50. Animal provided with a double united tube at the posterior termination of the cloak, foot long, and powerful for the size of the animal.

Pisidium obliquum. Pl. 60. f. 50.

SECTION III.—TENUIPEDES.

Family I.—Nymphacea.

Shell never having more than two primary teeth in each valve; frequently gaping at its lateral extremities; ligament exterior. The foot of the animal is small, and often compressed; the species all inhabit the shores of the sea.

Donax trunculus. Pl. 60. f. 46. The animal has two long slender tubes, which are received into a sinus of the mantle; and provided with a broad foot. F. 47. The right valve removed. *a a*, the adductor muscles; A, the foot; *s s*, the right lip; *m n*, the two lobes of the branchiæ; *b d*, *c e*, the two tracheæ; the left vein is at *i*.

Tellina planata. Pl. 60. f. 97.

Family II.—Lithophagi.

The shells gape more or less at their anterior side; ligament exterior; they bore into rocks and clay, without the aid of accessory shells, but by what means naturalists have not yet discovered.

Venerupis irus. Pl. 18. f. 69.

Family III.—Corbulacea.

Shell inequivalve, with the ligament placed interiorly.

Pandora rostrata. Pl. 18. f. 72.

Family IV.—Mactracæa.

Shell equivalve, frequently gaping at the lateral extremities; ligament placed interiorly, or partly exteriorly; animal with the foot small and compressed; the tubes are united and short.

Mactra Neapolitana. Pl. 60. f. 40. *b c*, the tracheæ; *d*, the foot.

SECTION IV.—CRASSIPEDES.

The mantle, either entirely or in part united before the foot, thick, placed posteriorly; the shell gaping when shut.

Family I.—Myaria.

Shell with a broad spoon-shaped tooth in each valve, or in one only, and gaping at both lateral extremities, or at one only; ligament placed interiorly. Live sunk in ooze or sand.

Mya arenaria. Pl. 60. f. 45. The mantle opens at the anterior extremity, or near the middle only, for the passage of the foot, and extended from the other end with a double tube which projects from the shell, whose extremities are always gaping; the double tube forms a fleshy cylinder.

Family II.—Solenides.

Shell transversely elongated, without accessory pieces, and gaping at the lateral extremities only; ligament placed exteriorly; the foot issues from the anterior extremity or from that side in which the teeth are nearest.

Solen Vagina. Pl. 60. f. 96. The foot of the animal is conical, which enables it to burrow with great facility in the sand. *e*, the trachiæ; *k*, the cloak; *n n*, adductor muscles; the foot, *b c*.

Family III.—Pholadaria.

Shell bivalve, with accessory pieces to the valves; they generally gape much anteriorly. The whole family are borers.

Pholas dactylus. Pl. 60. f. 95. The mantle is reflected externally upon the hinge, where it sometimes contains two or three supernumerary calcarious bodies; the foot issues through the aperture on the side next the mouth, where it is widest, and from the opposite one project the two tubes, which are united and susceptible of inflection in every direction.

Family IV.—Tubicola.

Shell contained in a testaceous sheath, distinct from its valves, incrusted entirely or in part in the wall of this tube, or projecting outwards.

Teredo navalis. Pl. 60. f. 16. The mantle extended in a tube much longer than the two small rhomboidal valves, and terminated by two short tubes, the base of which is furnished on each side with a stony and movable operculum. These acephala, while quite young, penetrate and establish their habitations in submerged pieces of wood, such as piles and the bottoms of ships; completely destroying them in a very short space of time. *a*, the œsophagus, which is very short, and lies on the left side of the neck; the canal swells out, and becomes a stomach, *b*, which, in its external appearance, is a large bag, extending the whole length of the cavity of the abdomen, but, when laid open, it is found to have a septum, *c*, dividing it longitudinally into two equal cavities, except at the lowest part, where they communicate at *d*, the septum being wanting. The intestine has its origin close to the termination of the œsophagus, is extremely small, dilates into a cavity containing a hard, white spherical body, the size of a pin's head, and then makes a turn upon itself. The course it follows is shown by the letters *e e*.

CLASS CIRRIPEDA.

Following the general practice, we treated the coverings of the Cirripeda as a branch of Conchology; and we now proceed with the plan we adopted in following up Mollusca, by the characters of the animals which inhabit the testaceous Cirripeda.

The Cirripeda form an intermediate group between the Mollusca and Articulata. The bodies are enveloped in a mantle, and testaceous plates or valves, which are nearly allied to those of the Acephala. The mouths of the animals are provided with lateral jaws, and the abdomen with filamentary jointed processes, named *cirri*, arranged in pairs, composed of numerous little ciliated articulations, and corresponding to feet or fins, similar to those which exist under the tail of crustaceous animals. Their heart is situated in the back, and the branchiæ emanate from the sides; the nervous system forms a series of ganglions, on the lower part of the abdomen. These cirri, however, may be considered as analogous to the articulated appendages of some species of Teredo, while the ganglions are in some measure repetitions of the posterior ganglion of the bivalve Mollusca. The position of these animals in the shell is such, that the mouth is at the bottom, and the cirri near the orifice. Between the last two cirri is a long fleshy tube, that has sometimes, but erroneously, been taken for their proboscis, and at the base of which, near the back, is the anal opening. Internally, a stomach is found inflated by a multitude of small cavities in its parietes, which appear to fulfil the functions of a liver, a simple intestine, a double ovary, and a double serpentine oviduct, whose walls produce the prolific fluid, and which, prolonged in the fleshy tube, open at its extremity. The animals of this class are incapable of locomotion, being always fixed. This class was all ranked under a single genus by Linnæus, by the title of Lepas. Brugieres divided them into two, and Lamarck has subdivided them still farther, at the suggestion of Dr Leach, and they now form a class of themselves.

The animals of this class are always protected by a multivalve shelly covering, which is composed of a number of separate pieces; these are connected by a membrane in the *pedunculata*, and those of the *sessilia*—six in number—are articulated at their sides, and kept together from their base, being attached to a calcarious plate, which is firmly attached to some extraneous substance. These last form a conical covering, open at the top, which is protected by an operculum or lid, composed of four pieces.

The first order of cirripeda have but five valves, and these are placed on the summit of a tubular, membranous peduncle, varying in length in different species. In one genus, besides the five principal valves, other smaller ones are found, which are termed accessory valves. All the animals are hermaphrodite and marine.

The characters of the class are, soft animals, destitute of head and eyes, covered with a plurality of shells, and always fixed to a certain spot; the bodies are inarticulated, provided with a mantle, tentacula, and cirri; arms issuing from above, and many-jointed.

ORDER I.—PEDUNCULATA.

The body compressed, and supported on a tubular peduncle.

Otion Cuvieri. Pl. 19. f. 26. Body pedunculated, ventricose above, and enveloped in a membranous tunic; two lobes disposed in the form of horns directed backwards, open at their extremity, truncated and placed at the summit of the tunic; having a lateral opening with many articulated arms or feelers.

Cineras vittata. Pl. 19. f. 27. Body seated on a peduncle, enveloped in a membranous tunic, with an anterior opening situate below the summit, and numerous slender, articulated arms.

Pollicipes mitella. Pl. 19. f. 28. Body resting on a tubular, tendinous tubercle, with many tentacular arms.

Anatifa vitrea. Pl. 19. f. 30. With a compressed mantle, open on one side and supported on a tubular tendinous peduncle; it has twelve pair of ciliated cirri or arms, six arising from near the summit on each side, those nearest the mouth being the thickest and shortest; the branchiæ are elongated pyramidal appendages, that adhere to the external base of the whole of the cirri or part of them.

ORDER II.—SESSILIA.

Body destitute of a peduncle, and inclosed in a shell of various parts, fixed immovably by its base, with a testaceous lamina to extraneous marine bodies; the mouth at the upper and anterior part of the body. In the interior of the opening is placed an operculum formed of two or four movable pieces, which the animal opens in the centre while projecting its tentacular arms.

Pyrgoma crenata. Pl. 19. f. 31. Operculum bivalve.

Balanus communis. Pl. 60, f. 94. *aa*, the venter; *vv*, the liver; *xx*, the ovarium; *h*, the spermatic ducts; AB, the œsophagus. Arms numerous, unequal, ciliated and articulated, each composed of two cirri supported on a peduncle, and exsertile; placed in two rows; mouth with four transverse dentated jaws, and four ciliated appendages resembling palpi. The operculum consists of four pieces.

CLASS ANNELIDES.

This class is the first of the great division Articulata, consisting of animals which have their bodies or members composed of articulated rings.

The characters of the Annelides, are, the body soft, more or less elongated, and either naked or enclosed in a tube, and divided into a number of segments; and are the only animals devoid of a backbone, which have red blood circulating in a double system of complicated vessels.

Their nervous system consists in a double knotted cord, like that of insects. Some species have a head, and others are devoid of one; when it exists it is merely a slight anterior thickening, distinct from the first segment of the body, and upon which the eyes and antennæ are placed. The antennæ consist of articulated filaments, sometimes short and thick, and never exceed five. They have either two or four eyes, situate behind the antennæ. The tentacula are either situated on the head or fore part of the body, they consist of articulated filaments, or papillæ more or less elongated. They are provided with a fleshy contractile proboscis, of either one or two rings, inclosing horny or calcarious jaws. The body of the Annelides in many species is naked, and free from hairs; some are furnished with contractile bristles.

The whole class respire by branchiæ, and inhabit the waters, sand, mud, or moist earth. The branchiæ are extremely variable in form and situation; as are also the tubes or sheaths, which are either membranous or horny, incrusted exteriorly with minute fragments of shells or grains of sand; in others they are solid testaceous tubes. They are all carnivorous, sucking the blood of other animals; and are hermaphrodite.

ORDER I.—SEDENTARIÆ.

The animals inhabit a testaceous tube, which they never leave; they are destitute of eyes; the branchiæ are situated at one end of the body. The animal is elongated, worm-shaped, having the sides of the body provided with subulate short bristles; and also with hooked bristles to enable it to move in its tube.

FAMILY I.—SERPULACEA.

Branchiæ separate, or covered by an operculum; tube, solid and testaceous; destitute of tentacula, eyes, or jaws; body furnished on the sides with setaceous papillæ, and hooked retractile bristles.

Serpula vermicularis. Pl. 60, f. 82. With a tubicular, elongated, slightly depressed body, and posteriorly attenuated, and with narrow segments; provided with small fasciculi of subulate bristles, placed in one row on each side, and hooked bristles; branchiæ terminal, fan-shaped, deeply cleft into five digitations, pinnated or plumose; mouth terminal, situated between the branchiæ and surmounted by a pedicellate funnel-shaped, or clavate operculum.

FAMILY II.—AMPHITRITÆA.

Branchiæ neither separated nor covered by an operculum, and disposed towards the anterior part of the body; with a horny or membranous tube, more or less arenaceous; the branchiæ are placed at or near the anterior extremity, they are sometimes large, projecting above the mouth, and sometimes they are short. Many of the animals have tentacula, but all of them are destitute of eyes, proboscis, or jaws.

Amphitrite magnifica. Pl. 60. f. 81. Body tubicular, cylindrical, elongated, and posteriorly attenuated, having numerous segments and a row of setiferous papillæ, subulate bristles in bundles, and hooked, golden-coloured setæ, arranged like a crown, or disposed like a fan; branchiæ terminal; mouth terminal, situate between the branchiæ, and encircled with numerous tentacula.

FAMILY III.—MALDANIÆ.

The branchiæ are indeterminate; and the tube is open at both ends.

Dentalium entalis. Pl. 60, f. 62. The animal is destitute of articulations or lateral setæ, but is provided with a membranous tube, into which is inserted a foot, or fleshy conical operculum, which closes its orifice; on the base of the foot is a small flattened head, with plumose branchiæ on the nape.

FAMILY IV.—DORSALIÆ.

The branchiæ are dorsal, or disposed longitudinally along the body.

Siliquaria anguina. Pl. 19. f. 51.

ORDER II.—ANTENNATÆ.

The head is antenniform, provided with two eyes, and a projectile proboscis, frequently armed with jaws, and setiferous retractile pediform papillæ; branchiæ disposed longitudinally.

SECTION I.

Branchiæ in the form of complicated leaves or tufts, or very ramose, always large and apparent; destitute of spines.

FAMILY I.—AMPHINOMÆ.

Branchiæ and cirri placed superiorly at all the pairs of pediform papillæ, and having no jaws.

SECTION II.

Branchiæ in the form of small crests or laminæ, or filamentous and pectinated on one side; sometimes not distinct.

FAMILY II.—EUNICÆ.

While the branchiæ are distinct, all the pediform papillæ are placed without interruption; jaws numerous, and always more than two, but fewer on the right than on the left side; destitute of the first pair of feet.

FAMILY III.—NEREIDES.

When the branchiæ are distinct, there are superior cirri on all the pairs of pediform papillæ; two jaws or none.

Spio quadricornis. Pl. 32, f. 14. Body elongated, slender, and provided with a row of tufts of very short bristles; the branchiæ are lateral, filiform, but not divided; tentacula two, very long and filiform or setaceous; mouth terminal; and with two or four eyes.

FAMILY IV.—APHRODITÆ.

The upper branchiæ and cirri alternating in their position to the twenty-third or twenty-fifth pair of pediform papillæ; having four jaws.

Halithea aculeata. Pl. 32, f. 4. Body oblong, hairy, spinous, and shining with iridescent splendour; dorsal scales with fuscous dots.

ORDER III.—APODES.

Animals destitute of feet, or setiferous and retractile papillæ; when provided with branchiæ, they are disposed interiorly along the body; but they have no antenniferous head.

Although the animals of this order have red blood, and a true circulation, they are otherwise the most imperfect in their form. They are destitute of head, tentacula, and pediform papillæ; their branchiæ are situated internally, either in or under the skin. They are usually naked, and have no retractile spines.

FAMILY I.—ECHIUREÆ.

Body with bristles projecting, but not retractile.

Lumbricus terrestris. Pl. 32, f. 39. The earth worm. Body flesh-coloured, composed of one hundred and forty annular sections, and a prominent annular belt one-third its length; on each side of the belly there is a row of minute spines to assist in motion.

FAMILY II.—HIRUDINEÆ.

Body without projecting bristles.

Hirudo geometra. Pl. 32, f. 13. Leech. The body is oblong, blunt, and slightly depressed, widening posteriorly, and composed of numerous contractile segments; the posterior extremity terminated by a broad prehensile disk; the mouth is naked, capable of great dilatation, armed interiorly with three teeth or horny jaws; destitute of eyes; anal opening above, near the posterior disk.

MOLOCH (Molach, or Molech, lord and king); an idol of the Ammonites, according to some writers, a symbol of the sun. His image was an iron statue, with a human body, the head of an ox, and extended arms. The statue was heated by a fire placed in the lower part, and children were placed, as offerings, in the arms of the horrid king, where they perished, while the priests drowned their cries with the noise of musical instruments.

MOLOSSUS. See *Rhythm*.

MOLTO (Italian, *very*, or *much*); a word used in conjunction with some other, by way of augmentation, as *molto allegro*, very quick, *molto adagio*, very slow.

MOLUCCAS, or SPICE ISLANDS; an archipelago between Celebes and New Guinea, having the Pacific ocean on the north, the straits of the Moluccas separating them from Celebes on the north-west, and the sea of the Moluccas on the south-west, between lat. 3° N. and 5° 30′ S., and lon. 124° 20′ and 132° 20′ E. The Little Moluccas are Ternate, Motir, Machian, Bachian, and Tidore; the Great Moluccas are Gilolo (q. v.), Ceram, Amboyna (q. v.), Banda (q. v.), &c. Most of the islands have volcanic traces, and many of them have active volcanoes. The heat is excessive, but is often moderated by the frequent rains, and, during a part of the year, by the prevalence of the north wind: the climate is healthy. The productions are sago, bread-fruit, cocoas, and all sorts of tropical fruits: the clove-tree is most plentiful in Amboyna, and the nutmeg-tree in Banda. Ebony, iron-wood, teak, a species of laurel yielding an aromatic oil, with other rare and valuable trees, are found in the forests. The barbaroussa, opossum, birds of paradise, cassowaries, &c., are among the animals. Hidden rocks, sand-banks, and shoals, make the navigation in this sea of islands dangerous. The aborigines are called *Harafores*, or *Alfores*, and are an agricultural people. The Malay is the prevailing language in the Moluccas. The following cut represents the costume of the inhabitants.

There are also many inhabitants of Chinese, Japanese, and Arabian extraction. When the Portuguese discovered the Moluccas (1511), the Arabians were already settled here, and Mohammedanism, much mingled, however, with paganism, had become the prevailing religion. The inhabitants were severely oppressed by the Portuguese, who perpetrated the most revolting cruelties in these islands, remote from the seat of the general administration (Goa), and no less harshly treated by the Dutch, who converted the produce of the soil to their own use, for more than 150 years, prevented the free cultivation of the land, and opposed every attempt to establish manufactures, and any kind of improvements which could supply the wants of the people. The Portuguese had almost entirely the monopoly of the spice trade till the beginning of the seventeenth century, when the Dutch took the islands from them. The new masters kept possession till 1796, since which time the islands have been twice conquered by the British. By the peace of Paris, they were again restored to the Dutch. These occupy only Amboyna and Banda, but the chiefs of the other islands are more or less tributary to them. After the Dutch had been about twenty-six years in possession of the Moluccas, and the monopoly of the spices, they found it advantageous to transplant the spice-trees to the southerly group of islands, Amboyna and Banda. In 1638, an agreement was made with the king of Ternate, who was subject to them, and the petty rulers of the other islands, by which it was stipulated that all the spice-trees on the islands belonging to them should be rooted up, and that no more should be planted; in consideration of which an annual sum was paid to the king and the nobility of Ternate, and the other princes. To ensure the fulfilment of this agreement, the Dutch erected three strong fortresses in Ternate, and about nine others in the other islands. The spice-trees, which again sprung up in these islands, were destroyed every year, as far as the woods and wild beasts permitted them to be reached; and, in order to see that this was properly executed, and to prevent the smuggling of spices, the governor of Amboyna went through his government every year, with a squadron of from twenty to fifty ships. But, notwithstanding these precautions, the spice-trees, the natural growth of the islands, continually sprung up where the power of the Dutch could not penetrate, and the British carried on considerable smuggling business with the oppressed natives. In other respects, the Moluccas are sparingly endowed by nature. They are wanting in water, and are obliged to procure rice and other necessaries of life from Celebes. The want of water is, in some measure, supplied by cocoa-trees, which grow in abundance, and the fruit of which contains a nourishing drink.

MOLWITZ; a village in the circle of Breslau, near Brieg, celebrated for the battle between the Prussians and Austrians, April 10, 1741, which was terminated in favour of the former by the exertions of Schwerin. Frederic II. (the Great) was present. He acknowledged that he did not then understand the art of war, and had committed important mistakes, but observed, at the same time, that the battle had been a good school for him and his soldiers.

MOLYBDENUM; a metal which has not yet been reduced in masses of any considerable magnitude, but has been obtained only in small, separate globules, of a blackish brilliant colour. It is extremely infusible. By heat, it is converted into a white oxide, which rises in brilliant, needle-formed flowers. Nitric acid readily oxidizes and acidifies the metal; nitre detonates with it, and the remaining alkali combines with its oxide. Molybdenum unites with several of the metals, and forms with them brittle compounds. The specific gravity of the pure metal is 8·611: it has three degrees of oxidation, forming two oxides and one acid. The *molybdic acid* is composed of forty-eight parts of molybdenum and twenty-four of oxygen; it has a sharp metallic taste, reddens litmus paper, and forms salts with alkaline bases; specific gravity, 3·4. It is very sparingly soluble in water; but the molybdates of potash, soda, and ammonia, dissolve in that fluid, and the molybdic acid is precipitated from the solutions by any of the strong acids. The *protoxide* of molybdenum is black, and consists of one equivalent of oxygen and one equivalent of molybdenum. The *deutoxide* is brown, and contains twice as much oxygen as the protoxide. Berzelius has formed three chlorides of this metal, the composition of which is analogous to the compounds of this metal with oxygen. The native *sulphuret* of molybdenum is composed of forty-eight parts, or one equivalent of molybdenum, and thirty-two parts, or two equivalents of sulphur. It occurs in most primitive countries, disseminated in granite, or gneiss rocks, in thin plates of a foliated structure, soft, flexible, slightly soiling the fingers, and greasy to the feeling; colour pure lead-gray; lustre metallic; specific gravity 4·591. It does not melt before the blow-pipe, but emits sulphureous fumes. It is nowhere found in large quantities, although known to exist in numerous places. Its principal European localities are Altenberg, in Saxony, and Schlaggenwald, and Zinnwald, in Bohemia. In the United States of America the largest and best pieces have been found in the gneiss quarries of Haddam, Connecticut, where plates half an inch thick, and four inches over, have been met with. At this place, it often exhibits the low six-sided prism. It also occurs at Brunswick, in Maine, in the same rock, and at Chesterfield, Massachusetts, in granite.

MOLYN, PETER. See *Tempesta*.

MOLYNEUX, WILLIAM; a mathematician and astronomer, born at Dublin, in 1656, whence he removed to the Inner Temple, London, in 1675. Being possessed of a competent fortune, he never engaged in the law as a profession, but, returning to Ireland in 1678, occupied himself with researches into various departments of natural philosophy, particularly astronomy. Having been appointed joint-surveyor of public works and chief engineer, he had a commission to examine the principal fortresses in Flanders. After his return, in 1686, he published his *Sciothericum Telescopicum*, containing an account of a telescope-dial of his invention. In 1689, he removed to London, on account of the political commotions of Ireland, and, in 1692, published a treatise on dioptrics, under the title of *Dioptrica Nova* (4to). Going back to his native country, he was chosen member of parliament for Dublin, in 1692; and, in 1695, he was elected representative of the university. He died October 11, 1698. Mr Molyneux was a fellow of the Royal Society, and a contributor to the Philosophical Transactions.—His son, *Samuel Molyneux*, who was secretary to George II., when prince of Wales, was also a cultivator of the mathematical sciences, and made some improvement in the construction of telescopes, of which doctor Robert Smith published an account, in his treatise on optics.

MOLZA, FRANCESCO MARIA, an Italian poet, was born at Modena, in 1489, of a distinguished family, lived principally in Rome, on terms of friendly intercourse with the most eminent scholars, and died 1544. His talents would have opened to him a brilliant career, had not his excesses obstructed his progress. Among his poems, the stanzas on the portrait of Giulia Gonzaga, and the *Ninfa Tiberina*, a poetical picture in *ottave rime*, are the most highly esteemed. His *Capitolo in Lode dei Fichi* is full of indelicacies; Annibal Caro wrote a commentary upon it. Molza is favourably known as a Latin poet. A complete collection of his works first appeared in 1747, with an account of his life, by the abbate Serassi.

MOMENT; an indefinitely small portion of time, having the same relation to duration as a point has to a line.

MOMENTUM, in mechanics, is the same with *impetus*, or quantity of motion, and is generally estimated by the product of the velocity and mass of the body. This is a subject, however, which has led to various controversies between philosophers, some estimating it by the mass into the velocity, as stated above, while others maintain that it varies as the mass into the square of the velocity; but this difference seems to have arisen rather from a misconception of the term than from any other cause, those who maintain the former doctrine understanding *momentum* to signify the momentary impact, and the latter the sum of all the impulses, till the motion of the body is destroyed.

MOMIERS; a Protestant sect, of recent origin, in Geneva and some other parts of Switzerland, founded by Empeytaz, a student of theology and follower of the baroness von Krudener, about 1813. He held conventicles for the edification of those who were not satisfied with the ordinary religious exercises; and, when he had completed his course of theology, the consistory of Geneva required of him a promise to discontinue these private meetings. This Empeytaz refused, and published a work on the divinity of Christ, in which he charged the clergy of Geneva with denying the divinity of Christ. The clergy of Geneva then required of all young candidates a promise to abstain from treating of the nature of Christ, original sin, grace and predestination, in the pulpit. This excited some discontents, and Malan, a clergyman of Geneva, at the head of the dissatisfied, and in connexion with Mr Drummond, an Englishman, with Empeytaz and others, formed a new church, or Orthodox church, and attacked their adversaries in pamphlets, with charges of Arianism, Socinianism, deism, and atheism. The Genevese clergy kept silence; and, since 1823, Malan has erected a house of worship, and administers the Lord's supper. His doctrines are of a mystical character. The name *Momiers* was at first given to the sect by way of contempt (from *momerie*, mummery), but has since been used as their appropriate designation. See *Hist. véritable des Momiers* (Paris, 1824); *Geschichte der sogen. Momiers* (Basil, 1825.)

MOMUS; the god of satire and pleasantry among the ancients. He was son of Nox, according to Hesiod. He blamed Vulcan, because, in the human form, which he had made of clay, he had not placed a window in the breast, by which whatever was done or thought there might be easily brought to light. He censured the house which Minerva had made, because the goddess had not made it movable, by which means a bad neighbourhood might be avoided. In the bull which Neptune had produced, he observed that his blows might have been surer if his eyes had been placed nearer the horns. Venus herself was exposed to his satire; and when the sneering god could find no fault in the body of the goddess, he observed that the noise of her feet was too loud for the goddess of beauty. These illiberal reflections upon the gods were the cause that Momus was driven from heaven. He is generally represented raising a mask from his face, and holding a small figure in his hand.

MONA; the ancient name of the island of Anglesea. (q. v.) The marquis of Anglesea was created duke of Mona in 1831.

MONACO; an Italian principality, lying between the Sardinian province Nizza (Nice) and the Mediterranean, with a population of 7000 inhabitants, and a superficial area of 535 square miles. In the tenth century, the emperor Otho I. conferred it on a prince of the house of Grimaldi, which became extinct, in the male line, in 1731. In 1641, the reigning prince, having put his territories under the protection of France, was created duke of Valentinois. The daughter of the last prince having married Francis de Matignon (1716), the princely and ducal titles passed to the French family of Matignon. In 1793, Monaco was incorporated with France, but, in 1814, was restored to its princes, and placed under the protection of Sardinia. The capital, Monaco (Monœci Arx), with 1200 inhabitants, is a fortified place, situated on the sea, in the midst of olive, orange and lemon groves. Lat. 43° 43′ N.; lon. 7° 22′ E.

MONAGHAN; a county of Ireland, in the province of Ulster, bounded N. by Tyrone, E. by Armagh, S. by Cavan, and W. by Fermanagh. It is above thirty miles in length, and twenty in breadth. The surface is hilly, and abounds with small lakes and hogs. The most important of the rivers are the Lagan, Annalee, Ballyhays, Fin, Fane, Myrvale, and Blackwater: none of these are navigable. The deep soil of Monaghan is favourable to the culture of flax, a favourite crop here; and all the usual crops are sown, wheat only excepted, to which the soil is not found congenial. Monaghan is divided into five baronies, Cremourne, Dartry, Farney, Monaghan, and Trough. In these the principal towns are Castleblaney, Ballybay, Clones, Carrickmacross, Monaghan, the county town, Smithsborough, and Newbliss. The manufacture of linen constitutes the chief employment of the population. See *Ireland* and *Ulster*.

MONALDESCHI. See *Christina, queen of Sweden*.

MONARCHY. See *Political Institutions*.

MONASTERY. Monastic seclusion is found, even in the times previous to the Christian era. The inclination to a solitary life arose with the corruptions of society. The better disposed persons, who felt themselves unequal to resist these corruptions, sought, in solitude, a protection against temptation. That indisposition to action, and that fondness for undisturbed contemplation, which is still remarked among the Hindoos, existed among the earliest inhabitants of Southern Asia, and gave rise to the most ancient Oriental philosophy, whose tendency to a contemplative life, aspiring to shake off the fetters of the body and sense, gave to retirement from the world the charm of a peculiar sanctity. To this was added the opinion, that transgressions may be best atoned for by abstinence from all the pleasures of life, and from all society of men, and thus, according to an ancient notion, popular throughout the East, the Deity might be appeased. Anachorites, hermits, recluses and monks are therefore found, in the ante-Christian times of Asiatic antiquity (see *Gymnosophists*); and, at the present time, the countries which profess the religions of Brama, Fo, Lama, and Mohammed, are full of fakirs and santons, tanirs, or songesses, talapoins, bonzes and dervises, whose fanatical and absurd penances are rather arts of deception than fruits of piety. The ancient Hebrew people, also, had such devotees, as its Nazarites, to whom Moses gave peculiar privileges; and the life of the Essenes and Therapeutes, who flourished in Palestine and Egypt about the times of Jesus, was entirely formed on the idea of separation from the world, and of monastic discipline and piety, which we afterwards see prevalent in the better period of Christian monasticism. Among the Christians, whose religion strictly distinguishes the corporeal and the spiritual, and, moreover, since the third century, has been impregnated with Gnostic and New Platonic ideas of incorporeality and elevation above the world of sense (see *Saints*), solitary life began to be esteemed, as early as the fourth century. See *Chrysostom*.

Monasteries were first founded in the deserts of Upper Egypt, where Antony, commonly called the *Great*, collected a number of hermits, about the year 305, who, for the sake of enjoying the benefits of retirement from the world in each other's society, built their huts near each other, and performed their devotional exercises in common, as the monks of Palestine did at a later period, and as those of Abyssinia do at the present day. More close than this connexion, which was called *Laura* (see *Anachoret*), was that founded by his disciple Pachomius, in the middle of the fourth century. He built a number of houses, at a small distance from each other, upon the island of Tabenna, in the Nile, each of which was occupied by three or four monks (*monachi*) in cells, who were all under the superintendence of a prior. These priories formed together the *cœnobium*, or monastery, which was under the care of a superior, the abbot, (from *abbas*, father), higumen or mandrite, and were obliged to submit to uniform rules of life. At the death of Pachomius, in 348, the monastic colony, at Tabenna, amounted to 50,000 persons. The districts in Palestine, Syria, and Armenia were filled with Cœnobites, and institutions of the same kind arose in and about the towns, in which a strict confinement within the walls of the establishment, was to preserve the inmates from the temptations of the world around them, and to supply the place of the solitude of deserts. Hence the name of *cloisters*, from *claustra*, enclosures. The monastic life, at first freely chosen by men alone, and therefore restrained by such laws only as each one thought fit to impose upon himself, for promoting the ends of solitary life, was subjected, by St Basil, to stricter rules, about the middle of the fourth century, when female monasteries, or convents of nuns (a word said, in Coptic, to signify *pure*), were instituted, and persons of all ages and stations entered the establishments. By means of these rules, the same discipline was kept up in all the monasteries through the East. Still there was not, in the fourth or fifth centuries, any thing like regular monastic vows, or public profession; except that the entrance into a monastery was regarded as a tacit devotion of one's self to a life of purity and abstinence from worldly pleasures, and a promise of obedience to the rules and restrictions of the institution. These vows were introduced in the sixth century, by St Benedict. It may be chiefly ascribed to his strict and judicious regulations, first established in a monastery founded by him at Monte Casino, near Naples, in 529, and afterwards introduced into all the monasteries of the West, that these houses now became the dwellings of piety, industry, and temperance, and the refuge of learning, driven to them for shelter from the troubles of the times. Missionaries were sent out from them; deserts and solitudes were made habitable by industrious monks; and, in promoting the progress of agriculture and civilizing the German and Sclavonian nations, they certainly rendered great services to the world, from the sixth century to the ninth. But it must be admitted that these institutions, so useful in the dark ages of barbarism, changed their character, to a great degree, as their wealth and influence increased. Idleness and luxury crept within their walls, together with all the vices of the world, and their decay became inevitable, when, by a custom first introduced by the Frankish kings, and afterwards imitated by other princes, of bestowing monasteries upon the nobility for the sake of their income, they came under the care of lay abbots or superiors, who, thinking only of the enjoyment of the revenue which they yielded, did nothing to maintain discipline among the monks and nuns, daily becoming more irregular, and when they were robbed and oppressed, or left wholly to their own government (in consequence of the privileges and exemptions they had obtained) by the bishops, who were originally their overseers, but had now lost their fondness for a monastic life. A few only, by means of the convent schools (founded by Charlemagne, for the education of the clergy), as, for instance, those at Tours, Lyons, Cologne, Treves, Fulda, Osnabruck, Paderborn, Wurtzburg, &c., maintained their character for usefulness and respectability till the ninth and tenth centuries. The monastery at Clugny, in Burgundy, first led the way to the reform, so generally acknowledged to be necessary. This was founded in the year 910, and was governed by the rules of St Benedict, with additional regulations of a still more rigid character. A considerable number of monasteries in France, Spain, Italy, and Germany, were reformed on this model, while others gave to the Benedictine rules a new form, and founded, in the eleventh and twelfth centuries, several orders with affiliated monasteries, which, as branches of the old Benedictine order, composed so many monastic communities, closely united by a proud and jealous spirit of confederation. With the reputation of renewed sanctity, the monasteries acquired new influence and new possessions. Many of them ("exempt monasteries") released themselves from all superintending authority, except that of the pope himself, and acquired great wealth in the time of the crusades, when those who adventured upon these expeditions left them their estates in trust till their return, or even the reversion of them in case of their death abroad. The privilege of inviolability, which had been granted, by common consent, to all monastic establishments, during the feuds of the middle ages, had induced many, who could find no better security for their property, in those days of rapine and violence, to place it under their protection. In this manner it happened that, as the zeal for reformation abated, and their influence was confirmed, new abuses sprang up in those establishments; and, as the authority of their spiritual and temporal lords was lessened by numerous exemptions, and was of little avail, when opposed by the combination of powerful religious orders, who had acquired great strength in all the countries of Europe, from the protection of the popes, the character of each monastery came, at last, to depend chiefly upon that of the abbot who was at its head.

The number of monasteries was much diminished at the time of the reformation, when the rich estates of the establishments which were deserted by the monks and nuns, in Protestant states, were in part appropriated by the sovereign to his own use, and partly devoted to the founding and supporting of institutions for the purposes of education, or transferred to universities and academies, were bestowed as rewards upon deserving ecclesiastics (as was the case with the abbeys in Lower Saxony and Wurtemburg), or were employed for the support of noble ladies until they married, as in Hesse, Holstein, Mecklenburg, &c. (For the suppression of the monasteries in England, under Henry VIII., see *Henry VIII.*) In Catholic countries, they retained their original constitution till the eighteenth century; but, from the influence of the spirit of the age, they sank in the public estimation, and were obliged, as the papal power diminished, to submit to many restrictions, imposed upon them by Catholic princes, or to purchase immunity at a high price. The benefits which they had formerly conferred upon the world, as the preservers of literary treasures; as places of refuge for the poor and the persecuted; as institutions for the education of youth; as places of retirement for persons of distinction who had outlived their usefulness, or were weary of the world; as schools for the mild correction and improvement of erring members of the human family,—appeared unimportant in the eyes of politicians and philosophers, when compared with their injurious effect upon the increase of population by their encouragement of celibacy; upon the public welfare, by their incessant grasping at the estates of wealthy persons, who had committed their children to their care; upon industry, by the idleness of their inhabitants; and upon public morals, by the sins which were notoriously committed within their walls. In this light were monasteries regarded by the greater portion of enlightened men, when, in 1781, the houses of some orders were wholly abolished by Joseph II., and those which he suffered to remain were limited to a certain number of inmates, and cut off from all connexion with any foreign authority. In France, the abolition of all orders and monasteries was decreed, in 1790, which example was followed by all the states incorporated with France, as well as by all the other Catholic states upon the continent of Europe, in the nineteenth century under the protection of Napoleon, with the exception of Austria, Spain, Portugal, Naples, Poland, and Russia. This measure seems to have been the result of financial calculations rather than the dictate of true humanity. In Prussia, provision was made for the monks who were dispossessed; and, after Joseph's example, the wealth obtained by secularizing the monasteries was appropriated to the support of churches and schools; but where the French system prevailed, these estates were thrown into the public treasury. Late events have much improved their condition in Italy; and Pius VII., in his concordate with France, Bavaria, and Naples, made provision for the maintenance of those already existing, and the foundation of new ones in those countries. In Austria, many monasteries have been suffered to become extinct. Not a few of these institutions render themselves useful, by the instruction of youth, especially of the female sex, and by taking care of the sick. For the monastic vows, see the next article; for further information, see *Orders, religious. Abbot*, *Anachoret*, &c.

MONASTIC VOWS are three in number; poverty, chastity, and obedience. The vow of poverty prevents the monks from holding any property individually; monasteries, however, may hold corporate property; for the Roman Catholic church makes a distinction between the high, higher, and highest degrees of poverty. In the first case, a monastery may possess portions of real estate, yet not more than enough for its support; as the Carmelites and Augustines. In the second, a monastery cannot hold any real estate, but only personal property; as books, dresses, supplies of food and drink, rents, &c.; as the Dominicans. The third permits neither the holding of real nor of personal property; as is the case with the Franciscans, and especially the Capuchins. The vow of chastity requires an entire abstinence from familiar intercourse with the other sex; and that of obedience, entire compliance with the rules of the order, and the commands of the superior.

MONBODDO, Lord. See *Burnett, James.*

MONCONTOUR; a village of France, in Vienne, about twenty-five miles N. W. of Poictiers. Henry III., when duke of Anjou, defeated Coligny here in 1569. See *Coligny.*

MONDAY (*moon* and *day;* Saxon *Monandæg;* German *Montag;* Latin *lunæ dies;* all of the same signification); the second day of our week, formerly sacred to the moon. See *Week.*

MONDAY, Plough. See *Plough Monday.*

MONDOVI, a city in the Sardinian territories, capital of the province of the same name, in Coni (*Cuneo*), thirty miles south of Turin; a bishop's see; population, 21,550. It is situated on the top of a steep hill, and surrounded by fortifications. Among the public buildings, the principal is the cathedral. The battle of Mondovi, gained by general Bonaparte in 1796, rendered the French masters of Piedmont.

MONEMBASIA, the Greek name for the place called in the English books *Malvasia.* The population given under *Malvasia* is that of the place before the late desolating war. The present population is but 200.

MONEY; the common medium of exchange among civilized nations. Money must consist of a material, 1. which has a value of its own; 2. which every man is willing to accept in exchange for his property; 3. whose value is readily ascertained. If this material is moulded into a particular form, and stamped with a mark denoting its value, so that it is appropriated expressly to the exchanging of articles having value, it is called *money*, in distinction from other articles which have value, but which are not used as a medium of exchange. The materials of which money is made, as well as the coin, are merchandise, like other articles that are bought and sold. Different nations, in the early periods of their cultivation, have chosen for money different materials, all having more or less of the above-mentioned peculiarities. All nations, advanced in trade and the arts, give preference to metals, especially the precious metals; for, 1. they derive value from the smallness of their quantities, compared with the demand for them in the ornamental and useful arts. 2. They are very little subject to corrosion and destruction by use. 3. They are susceptible of minute division, and may be used in small quantities or masses. 4. They are easily transported, as their transportation to any distance will cost but a small part of their value. 5. The quantity is increased by labour. The advantage of using the precious metals for a universal currency is still greater, when it is not left for every private man to divide the pieces of metal, to weigh them, and fix their fineness, but persons are appointed under the authority of the law, to decide what pieces shall be circulated as money, to stamp them so as to fix their weight and fineness, and to furnish them with the superscription of the authority by which they are authorized. Such pieces are called *coins*; (for the process of coining, see *Coinage*). Instead of money the merchant often receives a promissory note or bill: this substitute is sometimes improperly termed *money*. It is manifest that promissory notes or bills of exchange are of the same value with the real money only while they can be readily exchanged for coin, and that they must lose their value in proportion as the credit of those who issue them, sinks. This is true of all paper money (see *Circulating Medium*), and all metallic money whose current value is higher than its real value, all notes or bonds taken instead of money. That any sort of money may be received for its real value, or that which it represents, and trade be carried on by means of it, it is necessary that its value should be acknowledged wherever it is used. A distinction, however, is made between money which is received in only one trading-place or small circle, issued in time of peculiar necessity, denominated *tokens*, &c., also coins current in only one country, and money which is everywhere acknowledged and received, such as bars of gold and silver, of a certain weight and fineness, also Dutch ducats, Spanish dollars. The exchangeable value of gold and silver, like that of all other commodities, depends, in the first place, on their plenty or scarceness, or, in other words, the quantity supplied in comparison with the quantity wanted, or for which there is a demand; and, in the second place, upon the labour necessary in extracting the ore from the mines, and refining it. As a general rule, it may be assumed that if, taking the aggregate of silver mines, and that of iron mines, the expense, that is, the labour, including the use of machinery, necessary to extract a pound of silver from the ore, and refine it, is twenty times the expense, or labour, of smelting, forging, and refining a pound of iron, silver will be worth twenty times as much as iron. The comparative value of gold and silver will depend upon the same causes as that of either compared with iron, copper, or tin. In Britain, the value of gold, compared to that of silver, is as 15[illegible] to 1; in France, as 15.[illegible] to 1; in Geneva, as 15[illegible] to 1; and in the United States of America as 15[illegible] to 1. The comparative value is necessarily very nearly the same all over the world, since each metal costs but a trifle for transportation, and both are articles of value everywhere. The quantities of gold, in its various forms of coin and bullion of all descriptions, including bars, plate, &c., has been estimated to be 10,000,000 of pounds, troy weight.

A scarcity of money can occur only when, 1. the material of which it is manufactured is deficient, or, 2. when those in want of it have nothing to give in exchange to its possessors. In the last place, there is no real deficiency of money, for there are individuals who, by the terms of the supposition, possess the money: there is only a deficient demand for goods on hand, and those only are in want of money who are unable to dispose of these goods. Scarcity of money, therefore, is only a relative expression; i. e. there are certain places or persons without money to obtain certain articles which they desire to possess. All mechanics, artisans, and manufacturers want money enough to purchase the raw materials which they consume, and to pay the wages of their labourers. Merchants need money to pay manufacturers and producers for their goods, and to transport them where they are wanted, and the last consumer needs it to give in exchange for what he eats, drinks, wears, &c., to the dealer of whom he procures the requisite articles. Now, if any one of these classes has not the money required for any of those purposes, there is a scarcity of money for that class of individuals. In these and similar cases, the scarcity of money does not suppose a real scarcity of gold and silver, or a deficiency of coined metals. The scarcity arises from the want of industry, or means, in any class of citizens, to procure the money in circulation, or from their industry being directed to the production of such articles as there is no present demand for among the actual possessors of money; as when, for instance, in grain-growing countries, there is a deficiency of purchasers of the grain produced, there not being consumers enough of the grain, who can obtain or produce desirable articles in exchange for it. In such a case, the producers of grain can obtain money only by exportation of the article to foreign ports. And if it happens that the foreign lands to which it is exported are already provided with grain from some other quarter, it will remain unsold—not because there is no money, but because there is no motive to induce its possessors to part with it for grain. In places where manufactures of any kind prosper, a certain quantity of money is required to provide the materials. This sum is easily ascertained, according to a certain average, and there is no scarcity of money for these purposes, as long as this sum is on hand. But when the manufacture is increased, by the operation of particular circumstances, and the place produces more goods than common upon this account, a scarcity of money may easily occur among those devoted to this branch of business. If now these persons possess goods or credit, they make use of both to obtain the money required from other parts; which will depend, again, upon their being able to pay the expenses of transporting their goods, or to give to the holders of money a higher interest than they can elsewhere obtain. Money, in these cases, becomes of more value in these places than in those where it is not so much in demand; and it follows, from this, that money will leave the places where it is plenty to seek those where, from the want of it, more will be paid for its use; and, in this manner, a scarcity of money will work its own cure.

Money is profitable to any country only by means of its circulation (q. v.); for circulation makes money the continually repeated cause of the production of new portions of property; and, on this account, a small sum of money, in constant circulation, is of far more benefit to a country than the possession of the largest sums which remain locked up, and do not change owners. A great quantity of money, therefore, is of no service to a country, unless there are desirable things in that country, for the purchase of which it is to be paid, and thus transferred from one to another. When, therefore, more money flows into any country than will pay for what the country actually produces, money becomes of less value, and the money price of merchandise greater. In this case, it is better to procure the goods from countries where their money price is less. The money will thus be exported again, and procure a return of cheap goods in its place. But, by this process, the industrious part of the population are injured, and those only receive profit who make these exchanges of money for foreign goods. The labouring classes, therefore, experience a scarcity of money, because the articles which they produce do not command a ready sale. In this manner, all the gold and silver obtained by Spain and Portugal from South America passed into foreign countries in exchange for foreign necessaries. The only true means, then, to remove and to prevent permanently a scarcity of money, is to improve the state of domestic and internal industry; and their opinion is wholly destitute of foundation, who believe that a mere plenty of money is sufficient to develop a healthy state of domestic industry; for the money does not produce the goods, but follows their production. And money will not stay in a country that does not contain goods upon which it may be expended, but it seeks those countries which produce the objects of desire.

The worst of all means of supplying a scarcity of money is the multiplication of those things (as paper of all kinds) by which it is represented, or which are used as substitutes for it; for these circulating media are only worth so much as can be obtained in real value for them, and the scarcity of the precious metals in the country, preventing those who desire it from exchanging their money for them, the value of this paper medium falls at once. Nor does it help the case to base the value of this money upon any thing else than the precious metals; for, if their value is expressed in any article not so easily disposed of as gold or silver, as grain, for instance, these bills for grain are worth no more than the grain itself; and, if grain falls in value, these grain-bills must of necessity sink with them; and, if the grain cannot be used as a means of payment, then they lose their value altogether. A circulating medium fixed upon so insecure a basis can never take the place of real gold and silver. The truth of all these remarks is strikingly illustrated by the history of the continental paper issued by the American congress, during the revolution, and by that of the celebrated French assignats, which, resting upon the credit of a people without money, and without means of getting it, were soon found to be of little worth, or of none at all. Nor is this contradicted by the fact that the paper of the bank of England remained good during the stoppage of specie payments; for the wealth and the productiveness of this nation are so great as to render all transactions safe in any paper authorized by its government; and that wealth and industry combined place it in a situation so far removed from most countries, that it only forms, in this respect, a fair exception to a general law.

No certain estimate can ever be formed of the quantity of money required to conduct the business of any country; this quantity being, in all cases, determined by the value of money itself, the services it has to perform, and the devices used for economising its employment. Generally, however, it is very considerable; and when it consists wholly of gold and silver, it occasions a very heavy expense. The wish to lessen this expense has been one of the chief causes that have led all civilized and commercial countries to fabricate a portion of their money of some less valuable material, such as paper.

MONEY, Standard of. See *Standard*.

MONGE, Gaspar, a celebrated mathematician and natural philosopher, born at Beaune, in 1746, studied in the colleges of the fathers of the oratory at Beaune and Lyons with such success that he became a teacher at the age of sixteen. He was afterwards employed at the military school of Mézières, where he assisted Bossut, the professor of mathematics, and afterwards Nollet, professor of physics, whom he succeeded. In 1780, he removed to Paris, on being admitted into the academy of sciences, and became the coadjutor of Bossut, in a course of lectures on hydrodynamics at the Louvre. He quitted Mézières entirely in 1783, on being appointed examiner of the marine, when he composed a Treatise on Statics, afterwards used for the polytechnic school. In 1789, like other friends of freedom, Monge indulged in expectations of the regeneration of France. Through the influence of Condorcet, he was made minister of the marine, in 1792, and he held, at the same time, the portfolio of minister of war, during the absence of general Servan with the army. He thus became a member of the executive council of government, in which capacity he signed the order for the execution of Louis XVI. Shortly after, he resigned his functions, in consequence of which he was exposed to the persecution of the ruling party of the Jacobins, against which he successfully defended himself. He was then employed, together with other men of science, in improving the manufacture of gunpowder, and otherwise augmenting the military resources of the country. The Normal school was founded, with which Monge became connected; and he then published his *Géométrie descriptive*, one of his principal works. Together with Berthollet and Guyton Morveau, he principally contributed to the establishment of the polytechnic school; after which, in 1796, he was commissioned to go to Italy, and collect the treasures of art and science from the countries conquered by the French; and the labours of Monge and his colleagues gave rise to the splendid assemblage of works of taste and genius, which for a time ornamented the halls of the Louvre. In 1798, he went with Bonaparte to Egypt, where he was again employed in the service of science. On his return to France, he resumed his functions as professor at the polytechnic school, in the success of which he greatly interested himself. The attachment which he manifested to Bonaparte led to his being nominated a member of the senate, on the formation of that body. The emperor bestowed on him the title of *count of Pelusium*, the senatorial lordship of Liege, made him grand cordon of the legion of honour, gave him an estate in Westphalia, and, a little before he set out on his Russian expedition, a present of 200,000 francs. The fall of his benefactor involved him in misfortunes. He was expelled from the institute in 1816, one of his sons-in-law was exiled, and he was deprived of all his employments. His faculties became disordered, and he died July 28, 1818. Besides the works above noticed, Monge published *Description de l'Art de fabriquer les Canons* (4to), and *Application de l'Analyse à la Géométrie des Surfaces* (4to), as well as a multitude of memoirs on mathematical and physical science. His pupil Dupin has published an *Essai historique sur les Services et les Travaux scientifiques de Monge*.

MONGULS; a great nation in the north-east of Asia, which, after having been, at two different times, in the middle ages, distinguished for its conquests, has been sunk, for three centuries past in inactivity, and is now hardly known in Europe, but by name. The Monguls have been frequently confounded with the Tartars dwelling in south-western Asia, with whom, however, they have nothing in common but a nomadic mode of life, and an irregular savage method of waging war, pillage being their sole object. They differ from them essentially, by a dingy complexion, small eyes, and their corporeal structure in general, as well as by their language and manners. The annexed cut represents the dress of the males.

Their early history is obscure. In the thirteenth century, they spread their conquests and devastations from the depths of northern Asia over Russia, and other parts of Europe. They came from the regions which they now, in part, inhabit, Mongolia, north of the great wall of China, between the present Eastern Tartary and Bucharia. For their power and consequence they were indebted to the genius of a single extraordinary individual, Genghis Khan (q. v.), who having been, originally, merely the chief of a single Mongul horde, compelled the other hordes to submit to his power, and then, in 1206, conceived the bold plan of conquering the whole earth. In a short time he subjugated two great Tartar empires in the east and west of Asia, destroyed in six campaigns the mighty monarchy of the sultans of Chowaresmia, who reigned over Turkestan and all Persia as far as India, and during the same period sent part of his subjects, under the command of his eldest son, in 1223, to devastate Russia. After the death of Genghis Khan, in 1227, his sons pursued his conquests, subjugated all China, subverted the caliphate of Bagdad, and made the Seljook sultans of Iconium tributary. In 1237, a Mongul army again invaded Russia, conquered Moscow, and desolated a great portion of the country. Having subjugated Russia, the Monguls entered Poland in 1240, burned Cracow, and advanced in Silesia to Leignitz, where they conquered Henry, duke of Breslau, in a bloody battle, April 9, 1241. But want of provisions soon compelled them to leave the countries which they had laid waste with fire and sword. In Germany, and even France, where the former invasions of the Huns were held in remembrance, the fear of them was so great, that fasts and prayers were appointed to avert their approach. They were prevented from taking advantage of the general consternation to extend their conquests, by the disputes which arose respecting the succession to the throne, after the death of Khan Octai, the immediate successor of Genghis Khan. The empire of the Monguls still held together, and at the end of the thirteenth century was at the summit of its power. At that time, it extended from the Chinese sea and from India, far into the interior of Siberia, and to the frontiers of Poland. The principal seat of the great khan was China; the other countries were governed by subordinate khans, all of whom were descended from Genghis, and were more or less dependent on the great khan. The most powerful of the Monguls were the Kaptshaks, who lived on the Wolga, and were the scourges of Russia, and the Dshagatais, who lived between the river Oxus and Tartary. But this division of the empire among several petty princes was the cause of the gradual decay of the power and consequence of the Monguls in the fourteenth century. In the fifteenth century, various hordes of this nation were subjugated or destroyed by the Russians, whose conquerors they had previously been. In China, the empire of the Monguls had been overturned, in 1368, by a revolution. But, about 1360, there appeared a second formidable warrior of the tribe of the Dshagatai, Timurlenk (Tamerlane, q. v.), called also Timur Beg. He was of obscure descent, but, as the dynasty of the Monguls of Dshagatai had fallen into decline, raised himself by his talents and courage to the sovereignty of the whole nation. In 1369, he chose the city of Samarcand for the seat of his new government. The other Mongul tribes, with Persia, Central Asia, and Hindostan, were successively subjugated by him. In 1400, he attacked, in Natolia, the sultan Bajazet I., who had been hitherto victorious against the Christians in Europe, and before whom Constantinople trembled. The battle of Ancyra (Anguri), 1402, was decided against Bajazet; he suffered a total defeat, and was even made prisoner by Timur. The story of the severity which the conqueror is said to have used towards his prisoner, is not well substantiated. For a time, the Christian powers were thus freed from a formidable enemy. After Timur had conquered and desolated all Natolia, he died on an expedition to China, March 19, 1405, sixty-nine years of age. After his death, the monarchy of the Monguls was divided into several states. Baber (Babur), a descendant of Timur, founded, in India, in 1519, a powerful monarchy, which existed till the close of the eighteenth century, as the empire of the Great Mogul. See *Hindostan*.

The Mongul tribes now in existence live partly under Russian, partly under Chinese dominion. Those which remain of the tribe of the Kaptshaks live intermingled with the Calmucks, in the government of Irkutsk; their number, with that of the Calmucks, is estimated at 300,000. The rest, which are under Chinese sovereignty, but are governed by four different khans, live in Mongolia, which is bounded by Tungusia, China, Little Tartary, and Siberia. They all profess the religion of Fo (q. v.), lead a nomadic life, but, by means of caravans, carry on some trade with Russia, in woollen and cotton goods of their own manufacture. (See the *Hist. des Monguls depuis Tschinguiz-Khan jusqu'à Timour-Lane* (Paris, 1824), and Isaac James Schmidt's excellent *Forschungen im Gebieteder ältern, religiösen, politischen und literar. Bildunsgesch. der Mongolen und Tibeter* (St Petersburg, 1824). Schmidt's German translation of Ssanang Ssætsen's History of the Eastern Monguls, accompanied with a commentary, and with the Mongul original, has been printed at Petersburg, at the expense of the emperor. Baber's interesting Memoirs, written by himself, have been translated from the Dshagatai Turkish into English (London, 1826), by Leyden and Erskine with an introduction, very important for the history of the Monguls.

MONITEUR. November 24, 1789, a journal was commenced at Paris, the *Gazette Nationale, ou le Moniteur Universel*, which was intended to give an account of foreign events, but more especially of the doings of the national assembly, and on the 7th Nivose of the year VIII., it was declared an official paper. Since that time it has been the most important, and the only official journal of the French government. Since January 1, 1811, it has dropped the title *Gazette Nationale*, and retained only that of *Moniteur Universel*. The occurrences that took place between 1787 and the opening of the national assembly, have been subsequently added in an introduction published in the year IV. (Paris, 1 vol. fol.) In the year IX. (Paris, 2 vols. folio), appeared the *Révolution Française, ou Analyse complète et impartiale du Moniteur, par Ordre Chronologique*, and in the following year, the *Table Alphabétique du Moniteur* (likewise in 2 vols. folio), but neither of which, unfortunately, comes down farther than the close of the year VII. The *Moniteur* appears every day in a large folio sheet, often accompanied with supplements. It contains, in the two divisions appropriated to foreign and domestic news, not only the official ordinances and documents of the government, appointments, removals from office, promotions, &c., with notices on the arts, literature, and the drama, but also such political information as the government intends shall be regarded in France as official. The *Moniteur* had a great circulation in France and Europe generally, and also in America, during the revolution. Entire sets are rare. The years VII. and VIII. (1798—1800) in particular, of which a smaller impression was made, are often wanting. Among the daily papers of modern times, the *Moniteur* maintains a melancholy celebrity. It has exhibited, in the same nation, the picture of the most unbridled popular rage, and of oppressive monarchical despotism. It is one of the most important collections of public documents for the historian of the great changes in Europe since the beginning of the French revolution.

MONITOR; a genus of large lizards, which have teeth in both jaws, and none on the palate; most of them have the tail compressed laterally: they derive their name from a popular belief that they give warning of the approach of crocodiles, by making a kind of whistling noise. They are found in most parts of the world, and the fossil remains of species much larger than any now existing, have been discovered in various places in Europe.

MONITORIAL INSTRUCTION. See *Mutual Instruction.*

MONK. See *Monastery*, and *Orders, religious.*

MONK, George, duke of Albemarle, an English military officer, distinguished in history for the prominent part he acted in the restoration of Charles II., was the son of Sir Thomas Monk. He was born Dec. 6, 1608. Entering into the army at an early age, he served under Sir Richard Grenville, in an expedition to Spain, and in 1630, went to the Netherlands, where he was promoted to a captaincy. He was engaged in the unfortunate expedition of Charles I. against the Scots in 1639, at which period he was made lieutenant-colonel. On the rebellion taking place in Ireland, he was sent thither, and his services were rewarded with the post of governor of Dublin. Hostilities occurring between the king and the parliament, colonel Monk brought over his regiment to his majesty's assistance. He was appointed major-general in the Irish brigade; and being employed at the siege of Nantwich, was made a prisoner, and committed to custody in the Tower of London. He devoted his leisure to writing, and composed Observations on Military and Political Affairs, published not long after his death. Having been detained about three years in confinement, he accepted a commission from the parliament, on condition of being employed only against the Irish insurgents. He distinguished himself repeatedly in this service; but, having made a treaty with the Catholic chieftain O'Neal, which gave offence to the English parliamentary government, he resigned his command, and returned to his estate. After the entire overthrow of the royal party, Monk was employed with Cromwell in Scotland, and was present at the battle of Dunbar. His coadjutor returning to England, he was intrusted with the chief command. War taking place with the Dutch republic, he engaged in the naval service, and, together with admirals Blake and Dean, commanded in two engagements, in which they triumphed over the enemy, commanded by the famous Van Tromp. On the re-establishment of peace, Monk returned to Scotland, where, at the head of the English army, he maintained the authority of Cromwell in that country. On the decease of the protector, the resignation of power by his son, and the contest of parties which subsequently took place, he availed himself of the commanding situation which he occupied, to crush the republicans, and promote the recall and restoration of the Stuart family to the throne, in the person of Charles II. The dukedom of Albemarle, the order of the garter, and the office of privy-counsellor, rewarded the loyalty of the restorer of Charles II. During the Dutch war, Monk was again employed in the naval service, and in 1666 defeated the Dutch fleet commanded by his former antagonist, Van Tromp, and admiral De Ruyter. He died January 3, 1670, and was buried in Westminster abbey. He was married to a woman in low life, who maintained a complete ascendency over him.

MONKEY (*Simia*, Linn.) The monkey tribe forms by far the largest portion of the great order of *quadrumana*, and, in addition to hands on all the extremities, with long and flexible fingers and opposable thumbs, they generally possess also the following characteristics:—The incisor teeth are four in each jaw, and their molars resemble those of man: these are five in number on each side of each jaw in the monkeys of the old continent, and in one tribe of the new; the remainder of the American species have a sixth. The canines vary in size, from a powerful tusk to a trifling projection beyond their other teeth. The nails of all their fingers, as well as those of the thumbs, are invariably flat and expanded. The head is subject to great variations, in some approaching the human in form, and passing through every intermediate gradation, till it becomes as flat as that of the dog. But of all their organs there is none which exhibits so remarkable a discrepancy as the tail: this is wholly wanting in some; forms a mere rudiment in others; is short and tapering in a third group; moderately long and cylindrical in a fourth; in a fifth, extremely long, and covered with hair; whilst, again, in another group, it is long, denuded of hair beneath and at tip, and prehensile. On these characters naturalists have made several classifications of them, each differing from the other as to the value of certain distinctions. The following is that given by Cuvier, in the last edition of his *Règne Animal:*—

SIMIÆ.

I. Subgenus.	Apes proper, or of the ancient continent.	
1.	Subdivision.	Orangs. *Simia*, Erxl. *Pithecus*, Geoff.
2.	"	Gibbons. *Hilobates*, Ilig.
3.	"	Guenons. Monkeys. *Cercopithecus*, Erxl.
4.	"	*Semnopithecus*, F. Cuvier.
5.	"	Macaques. *Macacus.*
6.	"	Magots. *Inuus*, F. Cuvier.
7.	"	*Cynocephalus*, Cuvier.
8.	"	Mandrils.
II. Subgenus.	Apes of the new continent.	
1. Division.	Sapajoos.	
1.	Subdivision.	*Mycetes*, Ilig. Howling apes.
2.	"	*Àteles*, Geoff.
3.	"	*Brachyteles*, Spix.
4.	"	*Sagothrix*, Geoff. *Gastrimargus*, Spix.
5.	"	*Cebus*, Geoff.
2. Division.	Sakis.	
1.	Subdivision.	*Brachiurus*, Spix.
2.	"	*Callithrix*, Geoff.
3.	"	*Nocthora*, F. Cuvier.

But although thus diversified in their forms, they all possess some general characteristics. They are all mischievous, filthy, lascivious, and thievish. They all employ their fore-feet as hands. When injured or offended they use threatening gestures, chatter their teeth; and when pleased, appear to laugh. The dispositions of many of the species are extremely perverse, whilst others are so mild and tractable as to be readily tamed and taught a variety of tricks. They are all fond of hunting for vermin, both in their own fur, and in that of their companions, possess a very delicate sense of feeling, and are able to leap with surprising agility from tree to tree. Most of the species are gregarious, associating in large troops; but each troop is invariably formed of the same species. The monkeys proper are the most lively and active, their prehensile tail answering the purpose of an additional hand. In many parts of India, monkeys were made objects of worship, and magnificent temples erected to their honour. When the Portuguese plundered the island of Ceylon, they found, in one of the temples dedicated to these animals, a small golden casket, containing the tooth of a monkey. This was held in such estimation by the natives, that they offered 700,000 ducats to redeem it. The viceroy, however, ordered it to be burned. Some years afterwards, however, a Portuguese having obtained a similar tooth, pretended that he had recovered the old one, which so rejoiced the priests, that they purchased it from him for a sum exceeding 50,000 dollars. See *Ape*, *Baboon*, *Orang Otang*.

MONMOUTH, James, duke of, the son of Lucy Walters, one of the mistresses of Charles II., as is generally reported by that prince, although some circumstances render it highly probable that one of her former lovers was the father of the duke. He was born at Rotterdam, in 1649, and was always acknowledged by Charles, who had him carefully educated in France, as his natural son. After the restoration, he was sent home, and created earl of Orkney and duke of Monmouth, and received the garter. "He possessed," says Hume, "all the qualities which could engage the affections of the populace—a distinguished valour, an affable address, a thoughtless generosity, a graceful person. He rose still higher in the public favour by reason of the universal hatred to which the duke (of York), on account of his religion, was exposed. Monmouth's capacity was mean; his temper pliant; so that, notwithstanding his great popularity, he had never been dangerous, had he not implicitly resigned himself to the guidance of Shaftesbury, a man of such a restless temper, such subtle wit, and such abandoned principles. That daring politician had flattered Monmouth with the hopes of succeeding to the crown." This character explains his whole life. In 1679, he received the command against the Scotch covenanters, whom he defeated at the battle of Bothwell bridge, but was deprived of his command, and sent out of the kingdom, the same year, to quiet the fears of the duke of York. He soon after returned, and engaged in several conspiracies with Sidney, Shaftesbury, and other leaders, some of whom were desirous of establishing a republic; others merely wished to exclude the duke of York, while Monmouth entertained secret hopes of acquiring the crown. One of these plots, some of the parties to which were also concerned in the rye house plot, being discovered in 1683, Monmouth concealed himself for some time, but was afterwards pardoned on expressing his penitence. No sooner had he obtained his pardon than he disavowed having made any concessions to the court, and was, in consequence, ordered by Charles to depart from the kingdom. On the accession of James II., Monmouth, finding himself pursued by the king's severity, was induced, contrary to his judgment and inclination, by the impatience of some of his partisans, to attempt an invasion of England. He arrived at Lime with hardly a hundred followers (June, 1685); but his numbers were soon increased, and he assumed the title of king, and asserted the legitimacy of his birth. His forces were defeated at Sedgemore Bridgewater, and the duke himself was made prisoner, having been found in the disguise of a peasant, lying at the bottom of a ditch, overcome with hunger, fatigue, and anxiety. He refused to betray his accomplices, and conducted himself with much firmness on the scaffold, where his head was severed from his body, after four unsuccessful blows. The people, of whom he was still the favourite, believed that the person executed was not Monmouth, but one of his friends, who resembled him so nearly as to pass himself off for the duke, and suffer in his stead. It was probably this belief which has led some to conjecture that the famous Iron Mask was the duke of Monmouth.

MONMOUTHSHIRE; a county of England, originally included in Wales, but annexed to England by Henry VIII. It is bounded on the north by the counties of Brecknock and Hereford; on the east by Gloucestershire; on the south by the Bristol channel; and on the west by the counties of Glamorgan and Brecknock. Its extreme length, from north to south, is thirty-three miles, and its breadth twenty-six miles; its superficial contents being 316,800 acres. This county displays abundant traces of its occupation by the Romans, in the vestiges of their military roads, camps, and villas, with the tessellated pavements, coins, urns, and inscribed stones, which have been discovered at different periods. It exhibits still more permanent indications of the ascendency of its British population, in the names of the towns and villages, almost all of which are derived from the Cimbro-Celtic dialects; and Welsh is yet the general language of the lower classes of the inhabitants and the country people. The scenery in most parts is beautiful and picturesque, presenting a luxuriant diversity of hill and dale. The western portion is mountainous, and the eastern well furnished with wood; and between both are tracts of fine arable land, rich and fertile meadows and pastures, watered by numerous streams, and interspersed with towns, villages, country seats, and dilapidated remains of monastic or baronial establishments.

The principal rivers are the Wye, the Munnow, or Mynnow, the Usk, the Ebwy, and the Rumney. The Wye enters this county a little to the north-east of Monmouth, where it joins the Munnow, which rises in Brecknockshire, and then forms the boundary between the counties of Hereford and Monmouth: the united stream then passes to the border, and flows southward to its confluence with the Severn, below Chepstow. The Usk has its origin in Brecknockshire, and entering this county eastward of Crickhowell, takes a tortuous course towards its termination in the Bristol Channel, below Newport. The Ebwy also rises in Brecknockshire, and flowing westward of the Beacon Mountain, and through the romantic valley of Ebwy, falls into the estuary of the Usk. The Rumney, which divides this county from Glamorganshire, enters the Bristol Channel below Rumney Bridge. The long narrow valleys in different parts of Monmouthshire are watered by numerous streams of minor importance, several of which fall into the Bristol Channel. All the rivers abound with fish; and on the Wye and Usk are salmon-fisheries. The county town, Monmouth, situated at the conflux of the Munnow and the Wye, twenty-five miles west of Gloucester, is the only borough; and the market-towns are Abergavenny, Caerleon, Chepstow, Newport, Pontypool, and Usk. Population, in 1831, 98,130.

MONNIER, Pierre Charles Le; astronomer,

member of the academies at Paris, London, and Berlin, was born at Paris in 1715, and early displayed a decided inclination for astronomical studies. In his sixteenth year, he made observations on Saturn, and in his twentieth year communicated to the academy of sciences in Paris his *Nouvelle Figure de la Lune, avec la Description des Taches.* The academy admitted him into their number, and, in 1735, he went with Maupertuis to Lapland. In 1748, Monnier observed the annular eclipse of the sun, in Scotland, and was the first who measured the moon's diameter on the sun's disk. In 1750, Louis XV. employed him to run a meridian line through the castle of Bellevue. Lalande, with whom he was afterwards on unfriendly terms, was his pupil, and always spoke of him with the highest esteem. Lemonnier was of an impetuous and capricious temper; and after his death several valuable works were found among his papers, which, in spite of all entreaties, he had obstinately refused to publish, and which he threatened to burn. Among them was a catalogue of fixed stars, the plan of which he had exhibited to the academy in 1741. He was indefatigable in his labours, and his whole life was devoted to science, which is indebted to him for many improvements. He was the first to determine the difference of refraction in summer and winter. He corrected the tables of the sun, and the catalogues of the stars, fixed with greater accuracy the inclination of the ecliptic, and ascertained the elevation of the pole at Paris. He introduced into France the transit-instrument constructed by Graham, and pointed out the irregularities in the motion of Saturn, produced by the attraction of Jupiter. He died in 1799. Of his numerous works, his *Histoire Céleste* and his *Théorie des Comètes* deserve to be particularly mentioned.

MONOCHORD (from the Greek); an ancient instrument, or machine, so called, because it is furnished with only one string. Its use is to measure and adjust the ratios of the intervals, which it effects by the means of movable bridges, calculated to divide the chord at the pleasure of the speculatist. The *monochord* appears to have been in constant use with the ancients, as the only means of forming the ear to the accurate perception, and the voice to the true intonation, of those minute and difficult intervals which were then practised in melody.

MONOCHROME (Gr. *μονος*, single, and *χρωμα*, colour), in ancient painting; a painting with one single colour. This description of art, is very ancient, and was known to the Etruscans. The first specimens of the art of painting were of one tint only, which was most commonly red, made either with cinnabar or minium. Instead of red, white paint was sometimes used. Quintilian says of Polygnotus, and Pliny of Zeuxis, that their performances of this kind were of the latter description. The antique tombs of the Tarquins, in the neighbourhood of Corneto, offer several figures painted in white upon a dark ground. The first four plates in the first volume of the paintings of Herculaneum contain several monochromes upon marble. The most numerous monuments existing of this kind of painting are on terra cotta.

MONOCRAT has been used by a few writers to designate with one word an absolute monarch. They object to *autocrat*, as not sufficiently precise, since there might be also an autocratic body, that is, several or many persons who govern without any dependence on those who are governed.

MONODRAMA; a drama in which only one person plays.

MONOGRAM (*μονος*, single, or only, and *γραμμα*), in archæology; a character or cipher composed of one, two, or more letters interwoven, being a sort of abbreviation of a name, anciently used as a seal, badge, arms, &c. They were used on coins, standards, walls and tapestry, seals and documents; first on coins, latest on documents, in which they were employed not only by princes and ecclesiastical dignities, but also by magistrates and notaries. Their use particularly as arms is ancient, as appears from Plutarch, and from some Greek medals of the time of Philip of Macedon, and Alexander, his son. The Roman *labarum* bore the monogram of Jesus Christ, which consisted of two letters, a P placed perpendicularly through the middle of an X, as we find it on many medals of the age of Constantine, these being the two first letters of the word ΧΡΙΣΤΟΣ. Under the Eastern empire, it is usual to find MIK, which form the monogram of Mary, Jesus, Constantine. The use of monograms was exceedingly common upon Greek coins; and many antiquarians have bestowed much time and attention in the effort to decipher them—a useless labour, since a great number of these monograms were, without doubt, of a conventional nature, and understood only by a few, even in the times at which the coins were current. After the time of Charlemagne, who made much use of them, and improved their form, monograms became very common in all the countries which had belonged to the Frankish empire, but after the twelfth century, gradually went out of use. The use of them remained longest in Germany, where it was formally abolished by the diet of Worms, in 1495. The knowledge of monograms of this public kind is of great importance for the illustration of the monuments and documents of the middle ages, and therefore forms a particular branch of diplomatics. The term was subsequently applied to all sorts of ciphers and signs, with which artists, particularly painters and engravers, were accustomed to designate their works. These have often been counterfeited. The ancients called every outline, every simple sketch, a *monogram.* Montfaucon, in his *Paléographie Grecque*, has given a very extensive catalogue of monograms taken from medals of various kinds. John Fr. Christ's collection of figures of monograms, accompanied by explanations,—*Anzeige und Auslegung der Monogrammatum* (Leipsic, 1747),—is valuable; also Brouiilot's celebrated *Dict. des Monogrammes*, completed and corrected, in his *Table générale des Monogr.*, *Chiffres*, &c. (Munich, 1820).

MONOGRAPH (*μονος*, only, single, *γραφειν*); a treatise on a single subject in literature or science; thus we say, a *monograph* on violets, a *monograph* on Egyptian mummies. The advantage of a treatise of this nature is, that it allows more minuteness of detail in reference to all the properties and relations of the subject of the monograph. Papers in the memoirs or transactions of literary and scientific societies, and in periodical journals, are often monographs, and have contributed much to the progress of modern science.

MONOLITHIC (from *μονος*, single, and *λιθος*, stone); consisting of a single stone. According to Herodotus, there was a monolithic sanctuary attached to a temple at Sais, dedicated to Minerva, twenty-one cubits long, fourteen wide, and eight high, which was brought from Elephantine. The carriage of it employed 2000 men three years. Some striking specimens of monolithic temples are still found in Egypt, and, like the monolithic obelisks, bear testimony to the wonderful application of mechanical power among the ancient Egyptians. See *Obelisks.*

MONOLOGUE (*μονος*, single, *λογος*, discourse); in distinction from *dialogue* (q. v.), in the drama; the same as *soliloquy.* See *Soliloquy.*

MONOMANIA (from *μονος* and *μανια*); the name given, by some physicians, to that form of mania, in which the mind of the patient is absorbed by one idea; for instance, if the patient believes that he is God, or Christ, an emperor, &c. See *Insanity*.

MONONGAHELA; a river which rises from the Laurel mountains, in Virginia, runs north into Pennsylvania, and unites with the Alleghany, at Pittsburg, to form the Ohio. It is navigable for batteaux and barges thirty-two miles, to Brownsville, and still further for lighter boats. Its length is about 300 miles.

MONOPHYSITES; the members of the party who, according to the language adopted in the fifth century, maintain that there is but one nature in Christ, that is, that the divine and human natures were so united as to form but one *nature*, yet without any change, confusion, or mixture of the two natures. They were condemned as heretics, at the council of Chalcedon, in 451, which maintained that in Christ two distinct natures were united in one *person*, and that without any change, mixture, or confusion. This distinction without a difference gave rise to a violent dispute. The Asiatic and Egyptian clergy were inclined to the Monophysites, and were unanimous in maintaining the unity of nature as well as of person in Jesus, while the Western contended for the decree of the council. The edict called *Henoticon*, issued by the emperor Zeno, in 482, was not able to quiet the combatants, and, after long and often bloody contests, the orthodox church, by its sentences of excommunication, occasioned a formal secession on the part of the Monophysites. This separation took place in the first half of the sixth century, when the protection which the Monophysites had hitherto received at times from the court at Constantinople, necessarily ceased from the close union of the emperor Justinian with the Roman church. Neither did they remain united among themselves. In 483, the Acephali (q. v.) had already seceded, and formed the real strength of Monophysitism. In 519, new controversies arose among them respecting the question whether the body of Christ is corruptible or not. The Severites, adherents of a deposed patriarch of Antioch, Severus, who belonged to the Acephali, answered in the affirmative; the Julianists, or Gajanites, adherents of the bishops Julianus, or Gajanus, in the negative. The former were, therefore, called *Phthartolatrians (Corrupticolæ*, servants of corruptibility); the latter, *Aphthartodocetæ* (teachers of incorruptibility), or *Phantasiasts*, who again divided respecting the question whether the body of Christ was created, and formed the parties of *Actistetæ*, those who held it increate, and the *Ctistolatrians*, who believed it created. The Severites, also called, from one of their bishops, *Theodosians*, acquired the superiority, and pronounced excommunications against the *Agnoëtæ*, who also arose among them (so called, because they denied the omniscience of Christ as a man). About 560, a Monophysite, Askusnages, and after him Philoponus, the greatest Christian philosopher of that century, conceived the idea of styling the three persons of the Deity three Gods. These tritheists and their adherents, even in the eyes of the Monophysites, were the rankest heretics, and were the occasion of many Monophysites turning Catholics. In Egypt, Syria, and Mesopotamia, the Monophysite congregations, however, remained the strongest, had patriarchs at Alexandria and Antioch, existing, without interruption, by the side of the imperial orthodox patriarchs; and, after the Syrian, Jacob Baradæus, who died 588, had established their religious constitution, formed the independent churches of the Jacobites and Armenians which separated from the Greeks as well as the Romans, and have, for that reason, been able to maintain themselves since the seventh century, even under the dominion of the Mohammedans. Excepting their peculiar doctrine of one nature in Christ, they coincide, in the main points of belief, with the Greek church; their worship also resembles the Greek, rather than the Roman, but has, from their national character and their superstition, received variations, which are most striking in the religious constitution of the Egyptian Jacobites. These *Copts* are in communion with the Syrian Jacobites, but have their own patriarch at Cairo, the patriarch of Alexandria, who has ten bishoprics under him. The Bible and liturgical books they possess in the old Coptic language, which is the same as the Egyptian current under the Ptolemies, at the time of the dominion of the Greeks, and has, therefore, some similarity with the Greek, but is now a dead language. They baptize their children always in the church, and never till they are forty days old, and frequently not till they are seven years of age; but immediately after baptism, they receive the wine of the eucharist. The Lord's supper they celebrate only in the great feasts, use, in the celebration, leavened bread, which is broken, and taste the wine with spoons. According to a custom that had its origin in times of persecution, they attend divine worship in the night, between Saturday and Sunday. It consists merely of service at the altar, of singing, prayer, and reading by the priests, who are, moreover, extremely ignorant, and cannot preach. The patriarch preaches but once a year. Relics, poorly executed images in their churches, the worship of saints, &c., they have in common with the Greeks. Circumcision is customary only with the Copts in Upper Egypt. In their thinly-peopled convents, monks reside with women and children. A fourth Monophysite church is the Abyssinian, which receives its spiritual head from the Copts.

Connected with the Monophysite controversy was the question started in the beginning of the seventh century, whether, in Christ, the united divine and human nature had but one, or two wills. The decision of the Trullan council, at Constantinople, in 680, that there were two wills in Christ, because he had two natures, made the Monothelites (advocates of the doctrine of one will) heretics, but could not prevent the formation, from their remains, of the sect of the Maronites (q. v.).

MONOPOLY is an exclusive right, secured to one or more persons, to carry on some branch of trade or manufacture, in contradistinction to a freedom of trade or manufacture enjoyed by all the world, or by all the subjects of a particular country. The most frequent monopolies, formerly granted, were the right of trading to certain foreign countries, the right of importing or exporting certain articles, and that of exercising particular arts or trades. Such exclusive rights were very common in Britain previously to the accession of the House of Stuart, and were carried to an oppressive and injurious extent during the reign of queen Elizabeth. The grievance at length became so insupportable, that, notwithstanding the opposition of government, which looked upon the power of granting monopolies as a very valuable part of the prerogative, they were abolished by an act of 1624, the 21 James I. c. 3. This act secured the freedom of industry in Great Britain; and has done more, perhaps, to excite a spirit of invention and industry, and to accelerate the progress of wealth, than any other in the statute book. A few monopolies, however, on a large scale still exist. There is one species of monopoly sanctioned by the laws of all countries that have made any advances in the arts, namely, the exclusive right of an invention or improvement for a limited number of years. The exclusive right of an author to the publication of his own work, is hardly a monopoly, but rather a right of property, resting upon the same principle as the right to lands or chattels. The law, therefore, by giving an author the exclusive right to the publication of his own work, for a limited number of years, makes no grant; it is only allowing him what is his own, for a limited time. But the exclusive right to the use of an invention or improvement, is a monopoly, since it deprives others, for that period, of the chance of the advantage of making the same improvement, discovery, or invention themselves. It is taking away a right which they before had. The reason for this is, the encouragement of inventions and improvements, in the policy of which all the world concur. This is the only kind of monopoly generally acknowledged to be useful and expedient.

MONOPTERAL TEMPLES. See *Architecture*.

MONOTHEISM; the belief in, and worship of a single God, opposed to a plurality of gods (polytheism). The most ancient written records (the Bible), and the traditions of the most ancient nations, give us cause to regard this religion (in an imperfect state indeed) as the oldest and original religion. The Mosaic annals speak of God as the Creator of heaven and earth; and the ancient doctrines of the Bramins speak of a single divine nature holding pre-eminence over the three other principal divinities, which are to be regarded, as it were, as the three chief energies of a supreme God, viz. of the Parabrama, who is fully and clearly set forth, with all the attributes of divinity. The Chaldeans, also, besides the light which they opposed to darkness, believed in a higher increate light, which is eternal, almighty, wise, and good, and from which first proceeded the corporeal light. The Persians placed above their Ormuzd and Ahriman their Zeruanon Akherme, and the eternal word. Even the Egyptians had, in their Eikton, a Supreme Being, at least for their secret religion. All the different mythologies have, among the host of gods with which they people heaven and earth, some supreme God, more or less defined, but, in every case, distinguished above the others. And in every instance we see, in these mythologies, the gods gradually multiplied, as man departed, farther and farther, from the simple and original revelation, till lost in the multitude of deified personifications which he had himself created; but even in the case of the most refined polytheism, there always remains an idea of something more powerful, to which even the gods are subject, as the Fate of the ancients. The altar at Athens, "to the unknown God," mentioned in the Acts of the Apostles, is also a proof of the prevalence of the same feeling. Reflecting minds, too, were always found, who deviated from the national polytheism, as the heathen philosophers, Parmenides, Socrates, Plato, &c., and many later Platonists, the Egyptian philosopher Psammon, who, according to Plutarch (Life of Alexander), inculcated the doctrine that God is the general Father of all men, choosing the best of them for his children. The history of the Hebrews affords the most striking instance of the preservation of monotheism amid the corruptions of paganism. Notwithstanding the errors into which they were frequently led by the example of the nations around them, they still preserved the idea of one God, the Creator of heaven and earth, till, from their view of Jehovah, whom they regarded and adored, for the most part, only as the original God of the chosen people, was unfolded the purer and more comprehensive monotheism of Christianity.

MONOTHELITE. See *Maronites*.

MONROE, JAMES, one of the presidents of the United States of America, was born April 28, 1758, in Westmoreland county, Virginia, on the Potomac, on land of which, a century and a half before, his ancestor, who first migrated to this country, was the original grantee. He was educated at William and Mary college, and, in 1776, entered the revolutionary army as a cadet. He was soon after appointed a lieutenant, and, in the summer of that year, marched to New York, and joined the army under the command of general Washington. He was engaged in the battle of Harlem Heights, in that of White Plains, in the retreat through the Jerseys, and in the attack on Trenton. In the last, he was in the vanguard, and received a ball through his left shoulder. For his conduct in this action, he was promoted to a captaincy. General Wilkinson, in his Memoirs, bears strong testimony to the gallantry and zeal of Mr Monroe, in the New Jersey campaign. He was soon after appointed aid to lord Sterling, and served in that capacity during the campaigns of 1777 and 1778, and was engaged in the actions of Brandywine, Germantown, and Monmouth. He distinguished himself in these actions. By entering the family of lord Sterling, he lost his rank in the line, which he was anxious to regain; but, as this could not be regularly done, Washington recommended him to the legislature of Virginia, who authorized the raising of a regiment, and gave him the command. In the exhausted state of Virginia, colonel Monroe failed to raise his regiment, and therefore resumed the study of the law, under the direction of Thomas Jefferson, then governor of Virginia. He was active as a volunteer in the militia, in the subsequent invasions of Virginia, and, in 1780, visited the southern army, under De Kalb, as a military commissioner, at the request of governor Jefferson. In 1782, he was elected a member of the Virginia assembly, and, the same year, by that body, a member of the executive council, and, in 1783, at the age of twenty-four, a member of the old congress, in which he served three years. He was always at his post, engaged in the most arduous duties. He introduced a resolution to vest in congress the power to regulate the trade with all the states, and other important resolutions. He was appointed a commissioner to settle the controversy between New York and Massachusetts. In 1787, he was again returned to the assembly of Virginia, and, in 1788, was a member of the convention of that state, to decide on the present constitution of the United States. In 1790, he was elected a member of the senate of the United States, in which body he served until 1794. In May, 1794, he was appointed minister plenipotentiary to France. Mr Monroe was recalled from this mission in 1796, by president Washington, with an implied censure. In 1799, on the nomination of Mr Madison, he was appointed governor of Virginia, in which situation he served the constitutional term of three years. In 1803, he was appointed minister extraordinary to France, to act in conjunction with Mr Livingston, the minister resident there. This mission was of the greatest consequence to the United States, as it terminated in the acquisition of Louisiana. In the same year, he was appointed minister to London, and the next year to Spain. In 1806, in conjunction with the late William Pinkney, he was appointed minister to London, where he pursued the negotiations with the Fox ministry. Mr Monroe, having been prominently brought forward as a candidate for the presidency, as successor to Mr Jefferson, had an option given him to remain at the court of London, or return. He returned, but soon after withdrew from the canvass. In 1810, he was again elected a member of the assembly of Virginia, and, in a few weeks after the meeting of that body, governor of that state. Nov. 26, 1811, he was appointed secretary of state. The war department being in a very embarrassed state, on the departure of its head, general Armstrong, Mr Monroe undertook it, and made extraordinary and very useful exertions to help the war on the lakes, and the defence of New Orleans. After he had reduced to order the war department, he resumed the duties of the department of state, which he continued to exercise until, in 1817, he was chosen by the people of the United States the successor of James Madison. In 1821, he was re-elected by a vote unanimous with a single exception, one vote in New Hampshire having been given to John Q. Adams. He was wise and fortunate in the selection of his ministers and measures. He went further than either of his two immediate predecessors, in maintaining the necessity of an efficient general government, and in strengthening every arm of the national defence. He encouraged the army, increased the navy, and caused those foreign naval expeditions to be sent out to the West Indies, the Mediterranean, the coast of Africa, and the shores of South America, which have given instruction to the officers of the United States, augmented the number of their seamen, protected the national commerce, and caused the country to be universally respected by distant nations. He ordered the principal head lands and exposed points along the borders and the sea-coast to be accurately surveyed, plans of fortifications drawn, and the reports made up, with a view to the ultimate complete defence of the frontiers of the United States, both on the land and sea side. He directed inquiries, surveys, and plans, as to the most suitable sites for the northern and southern naval depots for the repair and accommodation of the fleets during times of war and peace. The cession of Florida by Spain to the United States was effected during his administration. It was during his administration that the emancipated Spanish and Portuguese colonies were formally recognised by the American government. He assumed high constitutional grounds in favour of internal improvement and the bank of the United States. He was mainly instrumental in promoting the pension law for the relief of indigent revolutionary soldiers. During his administration, the illustrious Lafayette was invited to visit these shores as the guest of the nation. He took the most energetic measures in favour of the abolition of the slave trade, and continued to encourage the establishment of the principles of commerce with all nations, upon the basis of free and equal reciprocity. It is a high compliment to the firmness, judgment, and sagacity of Mr Monroe, that he proclaimed to the world the determination of the United States not to suffer any European power to interfere with the internal concerns of the independent South American governments. The well-timed expression of this sentiment put an end to all rumours of any armed intervention in the affairs of Spanish America. Colonel Monroe retired from the office of president at the end of his second term. In the late stages of his life, he was associated with the ex-presidents Jefferson and Madison, in founding and regulating the university of Virginia. Subsequently, he was chosen a member of the convention for amending the constitution of his native state, and presided over the deliberations of that assembly. He did not disdain to act as justice of the peace in the county of London, in which he resided. Mr Monroe died at New York, on the 4th day of July, 1831, the anniversary of American independence, like the ex-presidents Adams and Jefferson. Colonel Monroe's biography is intimately and honourably connected with the civil and military history of the United States. We have merely indicated the principal stations which he held, and the nature of the services which he performed. He was one of the leaders of the democratic or Jefferson party, and involved in most of the party questions and occurrences by which the country was divided and agitated. He possessed a very energetic, persevering spirit, a vigorous mind, and extraordinary powers of application. In his unlimited devotion to the public business, he neglected his private affairs. He retired from office extremely deep in debt—a situation from which he was relieved, though when almost too late, by liberal appropriations of congress to satisfy the large claims which he preferred on the government for moneys disbursed and debts incurred on its account.

MONS (Latin for *mountain*); found in a great number of geographical names, particularly in languages derived from the Latin, as *Montigny* (inflamed mountain), *Piedmont* (foot of the mountain), *Montpellier* (Mons Puellarum), *Montmirail* (admirable mountain), *Montmartre* (mountain of Mars or of the martyrs), *Montreal* (royal mount), *Vermont* (green mountain), &c.

MONS (*Berghen*); a city lately belonging to the kingdom of the Netherlands, at present in the kingdom of Belgium, capital of the province of Hainault, situated on a steep hill, on the Trouille. Since 1818, its fortifications have been much extended and strengthened, and it now forms one of the strongest frontier fortresses of Belgium. The country around can be easily laid under water. Population, 20,000. Its manufactures have been considerable, consisting of woollen, linen, and cotton goods, oil, soap, pottery; and it has carried on an extensive trade in coals, obtained in the neighbourhood, hops, grain, cattle, horses, mill-stones, marble. Mons is an old city, and has belonged by turns to Spain, Austria, and France. See *Netherlands*.

MONSEIGNEUR (French, *my lord*); a title of dignity in France; the dauphin was formerly styled *monseigneur*, without any addition. Princes, archbishops, bishops, cardinals, marshals of France, presidents of parliament, &c., were addressed by this title. The plural is *messeigneurs*. The Italian *monsignore* is used in a similar manner.

MONSIEUR (in French), used simply, without any addition, formerly designated the king's eldest brother. In common use, it answers both to the English *Sir* and *Mr*, and is also used before titles. In writing, it is expressed by the abreviation *M.* The plural is *messieurs*. *Monsieur* is sometimes used by English writers as a term of contempt for a Frenchman.

MONSIGNY, PIERRE ALEXANDRE, born 1729, in Artois, a popular musical composer, who is considered as the creator of the French comic opera. While young, his talent for music was suddenly awakened by his witnessing the performance of Pergolesi's *Serva Padrona*, and he devoted himself entirely to the study. He learned composition under Giannotti, who dismissed him in five months, as a pupil who knew all that he could teach. But Giannotti was astonished to find that his pupil had already composed an opera, *Les Aveux indiscrets.*, which he brought out, after having recast it, three years afterwards (1759). Encouraged by its success, he produced, in 1760, *Le Cadi dupé* and *Le Maître en Droit.* The opera *On ne s'Avise jamais de tout*, brought forward in 1761, completed the musical revolution at the *théâtre de la Foire*, which then took the name of the *Italian opera*. *Le Roi et le Fermier; Rose et Colas; Aline, Reine de Golconde; L'Isle sonnante; Le Deserteur*, &c., were received with great applause. On the death of Grétry, Monsigny succeeded him in the institute, and on the death of Piccini, in 1800, he was appointed director of the *conservatorie*, at Paris. He died in 1817.

MONSOONS (from the Malay *mussin*, season); periodical trade-winds, which blow six months in one direction, and the rest of the year in an opposite one. They prevail in the Indian ocean, north of the 10th degree of south latitude. From April to October, a violent south-west wind blows, accompanied with rain, and from October to April a gentle, dry, north-east breeze prevails. The change of the winds, or the *breaking up* of the monsoons, as it is called, is accompanied by storms and hurricanes. These periodical currents of winds do not reach very high, as their progress is arrested by mountains of a moderate height. See *Winds*.

MONSTERS; in physiology, creatures whose formation deviates in some remarkable way from the usual formation of their kind. The deviation consists sometimes in an unusual number of one or several organs; sometimes, on the contrary, in a deficiency of parts; sometimes in a malformation of the whole or some portion of the system, and sometimes in the presence of organs or parts not ordinarily belonging to the sex or species. In most cases, these unusual formations are not incompatible with the regular performance of the natural functions, although they sometimes impede them, and, in some cases, are entirely inconsistent with the continuance of the vital action. It is not surprising that we should be ignorant of the manner in which monsters, or irregular births, are generated or produced; though it is probable that the laws by which these are governed are as regular, both as to cause and effect, as in common or natural productions. Formerly, it was a general opinion, that monsters were not primordial or aboriginal, but that they were caused subsequently by the power of the imagination of the mother, transferring the imperfection of some external object, or the mark of something for which she longed, and with which she was not indulged, to the child of which she was pregnant, or by some accident which happened to her during her pregnancy. But this has been disproved by common observation, and by philosophy, not, perhaps, by positive proofs, but by many strong negative facts; as the improbability of any child being born perfect, had such a power existed; the freedom of children from any blemish, though their mothers had been in situations most exposed to objects likely to produce them; the ignorance of the mother of any thing being wrong in the child, till, from information of the fact, she begins to recollect every accident which happened during her pregnancy, and assigns the worst or the most plausible as the cause; the organization and colour of these adventitious substances; the frequent occurrence of monsters in the brute creation, in which the power of the imagination cannot be great; and the analogous appearances in the vegetable system. Judging, however, from appearances, accidents may perhaps be allowed to have considerable influence in the production of monsters of some kinds, either by actual injury upon parts, or by suppressing or deranging the principle of growth, because, when an arm, for instance, is wanting, the rudiments of the deficient parts may generally be discovered.

MONSTRELET, ENGUERRAND DE, a chronicler of the fifteenth century, born at Cambray, of which he became governor, was the author of a history in French, of his own times. The history extends from 1400 to 1467; but the last fifteen years were furnished by another hand. It contains a narrative of the contentions of the houses of Orleans and Burgundy, the capture of Normandy and Paris by the English, with their expulsion, &c. Monstrelet died in 1453.

MONT BLANC (*white mountain*); the loftiest mountain of Europe, one of the summits of the Pennine Alps, on the borders of Savoy and Aosta, between the valleys of Chamouni and Entreves; lat. 45° 50′ N.; lon. 6° 52′ E. The following measurements of its elevation above the surface of the Mediterranean sea are deemed the most accurate: by M. Deluc, 15,302 feet; M. Pictet, 15,520; Sir George Shuckburgh, 15,662; M. Saussure, 15,670; M. Tralles, 15,780. Its elevation above the valley of Chamouni is 12,160 feet. It is discernible from Dijon and Langres, 140 miles distant. It received its name from the immense mantle of snow with which its summit and sides are covered, and which is estimated to extend not less than 12,000 feet, without the least appearance of rock to interrupt its glaring whiteness. An ascent to the summit was first made, in 1786, by doctor Pacard, of Chamouni, and his guide, James Balma. In August, 1787, Saussure ascended it with eighteen guides, and remained on the summit five hours. The pulse was found to beat more rapidly, and the party complained of exhaustion, thirst, and want of appetite. The colour of the sky was very deep blue, bordering on black, and in the shade the stars were visible. Up to 1828, fourteen ascents had been made. In 1818, Messrs Howard and Van Renssalaer from New York, in 1825, doctor Clark and captain Sherwill, ascended it. See Sherwill's *Visit to the Summit of Mont Blanc* (London, 1827.) In 1827, two English gentlemen, who made the attempt, were obliged, by a new cleft in the ice, to take a new course, which has proved to be less toilsome and hazardous than the former. Eighteen glaciers lie around, whose various and fantastic forms increase the magical effect of the wonderful spectacle from the summit, from which the view extends nearly 150 miles in almost every direction. The highest summit is a small ridge, about six feet wide, precipitous on the north side, and called in Savoy, the *dromedary's back*. It is covered with a solid body of snow. See *Alps*, *Glaciers*, *Andes*, *Himalaya*, and *Mountains*.

MONT D'OR; a mountain of France, in Puy-de-Dome, about 6130 feet above the level of the sea, abounding in curious plants and mineral springs.

MONT PERDU; summit of the Pyrenees, on the frontier line between France and Spain; about 100 miles east of the bay of Biscay, and further west from the Mediterranean. It has a double summit, one computed at 10,700 feet, or, by another statement, 11,265 feet high; the other at 10,400. The line of perpetual congelation here is about 7500 feet in height.

MONTAGU, CHARLES, earl of Halifax; an English statesman and poet, born at Horton, in Northamptonshire, in 1661. He was descended from the family of the Montagus, earls of Manchester, and was educated at Westminster school, and Trinity college, Cambridge. From the university he went to London, where he attracted notice by his verses on the death of Charles II.; and, in 1687, he wrote, in conjunction with Prior, the City Mouse and Country Mouse—a travesty on Dryden's Hind and Panther. In the reign of William III. he obtained the place of clerk of the privy council, and became a member of the house of commons. In 1694, he was made chancellor of the exchequer, and subsequently first lord of the treasury. His administration was distinguished by the adoption of the funding system, and the establishment of the bank of England. In 1698, Montagu was a member of the council of regency during the absence of the king, and, in 1700, was raised to the peerage. In the reign of Anne, when tory influence prevailed, he was twice impeached before the house of lords; but the proceedings against him fell to the ground. George I. created him earl, and bestowed on him the order of the garter; but Halifax, being disappointed in his expectation of obtaining the office of lord treasurer, joined the opposition. His death took place May

19, 1715. The poems and speeches of lord Halifax were published, with biographical memoirs, in 1715 (8vo); and the former were included in the edition of English Poets, by doctor Johnson. He aspired to the character of the Mæcenas of his age, and his patronage of Addison is creditable to his discrimination, though little can be said in praise of his munificence.

MONTAGU, Lady Mary Wortley, one of the most celebrated among the female literary characters of England, was the eldest daughter of Evelyn, duke of Kingston, by his wife lady Mary Fielding, the daughter of the earl of Denbigh. She was born about 1690, at Thoresby, in Nottinghamshire, and displaying uncommon abilities at an early age, was educated upon a liberal plan, and instructed by the same masters as her brother, in the Greek, Latin, and French languages. In her twentieth year, she gave an extraordinary proof of her erudition, by a translation of the *Enchiridion* of Epictetus, which was revised by bishop Burnet, by whom her education was ultimately superintended. Her mind was nourished in great comparative retirement, previously to her marriage, in 1712, with Edward Wortley Montagu. Even after her marriage, she lived chiefly at her husband's seat of Wharncliffe, near Sheffield, until the latter, being introduced to a seat in the treasury, by the earl of Halifax (*see the preceding article*), brought his lady to London. Being thus placed in the sphere of the court, she attracted that admiration which beauty and elegance, joined to wit and the charms of conversation, never fail to inspire. She became familiarly acquainted with Addison, Pope, and other distinguished writers. In 1716, Mr Wortley being appointed ambassador to the Porte, lady Mary determined to accompany him, and hence her admirable correspondence, chiefly consisting of letters addressed to the countess of Mar, lady Rich, and Mr Pope; to whom she communicated her observations on the new and interesting scenes to which she was a witness. On many occasions she displayed a mind superior to common prejudices, but in none so happily as in a courageous adoption of the Turkish practice of inoculation for the small-pox in the case of her own son, and a zealous patronage of its introduction into England. In 1718, Mr Wortley returned to England, and at the request of Pope, lady Mary took up her summer residence at Twickenham, and a friendship was formed between these kindred geniuses, which gradually gave way to dislike, produced by difference of political opinion, petulance and irritability on the side of the poet, and no small disposition to sarcastic keenness on that of the lady; and a literary war ensued, which did honour to neither party. Lady Mary preserved her ascendency in the world of rank and fashion until 1739, when, her health declining, she took the resolution of passing the remainder of her days on the continent, not without the world surmising that other causes concurred to induce her to form this resolution. She, however, retired with the full concurrence of her husband, with whom her subsequent correspondence betrays neither resentment nor humiliation. Venice, Avignon, and Chamberry were, in turn, her residence, until the death of Mr Wortley, in 1761, when she complied with the solicitations of her daughter, the countess of Bute, and returned to England, after an absence of twenty-two years. She enjoyed a renewal of family intercourse for a short time only, as she died of a gradual decay, in 1762, aged seventy-two. As a poetess, lady Mary Wortley Montagu exhibits ease, and some powers of description; but she is negligent and incorrect. The principal of her performances in this class is her Town Eclogues, a satirical parody of the common pastoral, applied to fashionable life and manners. As a letter-writer, her fame stands very high; her letters were collected and copied by herself, and presented, in 1766, to the reverend Mr Sowden, of Amsterdam, of whom they were purchased by the earl of Bute: a surreptitious copy of them was published in 1763, in three vols., 12mo. The authenticity of these letters, which obtained universal admiration for their wit, judgment, and descriptive powers, was, for a long time, doubted; but all distrust was done away by the following publication, under the sanction of the earl of Bute: the Works of the Right Honourable Lady Mary Wortley Montagu, including her Correspondence, Poems, and Essays, published by permission from her genuine papers (London, 1803, 6 vols., 12mo), with a Life, by Mr Dallaway. This edition contains many additional letters, written in the latter part of her life, which display much excellent sense and solid reflection, although tinged with some of the prejudices of rank, and indicative of increasing misanthropy.

MONTAGU, Edward Wortley, the only son of the subject of the preceding article, was born in 1713. At an early age, he was sent to Westminster school, from which he ran away three times, and, associating himself with the lowest classes of society, passed through some extraordinary adventures, sailed to Spain as a cabin-boy, and was at length discovered by the British consul at Cadiz, and restored to his family. A private tutor was then provided for him, with whom he travelled on the continent. During his residence abroad, he wrote a tract, entitled Reflections on the Rise and Fall of Ancient Republics. On his return to England, he obtained a seat in the house of commons; but, living extravagantly, he became involved in debt, and left his native country never to return. His future conduct was marked by eccentricities not less extraordinary than those by which he had been distinguished in the early part of his life. He went to Italy, where he professed the Roman Catholic religion; and from that he apostatized to become a disciple of Mohammed, and a scrupulous practiser of the formalities of Islamism. After passing many years in Egypt, and other countries bordering on the Mediterranean, he was about to return to England, when his death took place at Padua, in Italy, in 1776. He was the author of an Examination into the Causes of Earthquakes, and some papers in the Philosophical Transactions.

MONTAGU, Elizabeth, a lady of literary celebrity, was the daughter of Matthew Robinson, of the Rokeby family, and was born in 1720. She had an opportunity of prosecuting her studies under the direction of doctor Conyers Middleton, to whom she was probably indebted for the tincture of learning which so remarkably influenced her character and manners. In 1742, she became the wife of Mr Montagu, who left her mistress of a handsome fortune, which enabled her to gratify her taste for study and literary society. In 1769, she published an Essay on the Writings and Genius of Shakspeare. This work raised Mrs Montagu to the rank of an arbitress of public taste. She opened her house, in Portman-square, to the Blue Stocking Club—a society so denominated from a peculiarity in the dress of Mr Benjamin Stillingfleet, one of the members; and carried on an epistolary correspondence with men of letters, published after her death, August 25, 1800.

MONTAIGNE, Michel de, one of the most ingenious and ingenuous of French writers, was born Feb. 28, 1533, at the castle of the same name, belonging to his family, in Perigord. His father, Pierre Eyghem, seigneur de Montaigne, an Englishman by birth, and a brave soldier, who had been chosen mayor of Bourdeaux, bestowed the greatest care on the cultivation of young Michel's promising talents, but adopted a peculiar mode of education. In order to facilitate his son's acquisition of the Latin language, which he had himself found difficult, he employed a German tutor, entirely ignorant of French, but complete master of Latin, before the child had left the nurse's arms; and as all the family were never permitted to speak any other language in the presence of the child, he had the pleasure of seeing the infant so completely matriculated into it as to be obliged to learn the French as a foreign tongue. "We all Latinized," says Montaigne, "at the castle, in such a manner that several Latin expressions came into use in the villages around, which exist to this time." Greek he learned in the usual manner, after it had been attempted in vain to delude him into a knowledge of it. The treatment of his father was peculiar in some other respects; thus he caused him to be waked in the morning by the sound of musical instruments, lest the genius of the boy should be injured by his being roused too suddenly; he allowed him the most unrestrained indulgence in his plays, and endeavoured to lead him to the faithful performance of his duties solely by inspiring him with a sense of right and wrong. Montaigne always shows the greatest regard for his father's memory. At the age of thirteen, he had finished his studies at the college of Bourdeaux, under Grouchy, Buchanan, and Muret. His father destined him for a judicial station, and married him somewhat later to Françoise de la Chassaigne, daughter of a counsellor of the parliament of Bourdeaux. Montaigne was for some time a parliamentary counsellor, but his aversion to the duties of the station led him to retire from it. The study of man was his favourite occupation. To extend his observations, and to restore his health, which had been shattered by the attacks of a hereditary disease (the stone), he travelled in Germany, Switzerland, and Italy, and was everywhere received with great distinction. At Rome, which he visited in 1581, he received the title of a Roman citizen. In 1582, he was chosen mayor of Bourdeaux, and the citizens of that place were so well satisfied with his administration, that they sent him to the court (in 1584), to attend to their interests there. Without doubt, the order of St Michael was conferred on him by Charles IX., at this time, without any solicitation on his part, as has been reported. After making several other journeys of business, he returned to his castle, and devoted himself entirely to philosophy. His quiet, however, was disturbed by the troubles which distracted France in consequence of the cruel persecutions of the Huguenots; his castle was plundered by the leaguers, and he himself was ill treated by their adversaries. To these causes of distress was added the plague, which broke out in Guyenne, in 1586, and compelled him to leave his estate, with his family, and wander through the country, which was then the theatre of all kinds of atrocities. He then resided some time in Paris, but finally returned home, and died in 1592, after much bodily suffering, with the composure of a philosopher.

Montaigne has described himself in his celebrated *Essais*; but he confesses only the lighter faults. He acknowledges himself indolent and averse to restraint, and complains of the badness of his memory. He had few of what are commonly called friends, but to his chosen intimates he was warmly attached. He loved to converse on familiar terms with educated men, whose observations were *teints d'un jugement mûr et constant, et mêlés de bonté, de franchise, de gaieté et d'amitié.* He was also fond of the society of handsome and intelligent women, although he says one should be on his guard against them. The imagination he considered a fruitful source of evil. He had many ideas on education which have been revived in our times, without his receiving the credit of them; he wished that children should enjoy both physical and moral freedom; swathing he considered as injurious, and was of opinion that habit would enable us to dispense with all clothing. His views on legislation and the administration of justice enlightened his own age and have been useful to ours. He endeavoured to simplify the laws and legal processes, and very justly remarks that laws are often rendered futile or injurious by their excessive rigour. His moral system was in general indulgent, but on some points strict. Speculative philosophy he rejected, devoting himself to the lessons of experience. He studied human nature in children and illiterate peasants. Equally removed from a general scepticism and from dogmatism, he was accustomed to suggest possibilities instead of making assertions, and to throw light on his subject from every point. His motto was *Que sais-je?* His great work, his *Essais* (first published in 1580, and often republished and translated into many languages), contains a treasure of wisdom. It may still be deemed one of the most popular books in the French language. The essays embrace a great variety of topics, which are touched upon in a lively entertaining manner, with all the raciness of strong, native good sense, careless of system or regularity. Sentences and anecdotes from the ancients are interspersed at random with his own remarks and opinions, and with stories of himself, in a pleasant strain of egotism, and with an occasional license, to which severer casuists can with some difficulty reconcile themselves. Their style, without being pure or correct, is simple, bold, lively, and energetic, and, according to La Harpe, he "impressed on the French language an energy which it did not before possess, and which has not become antiquated, because it is that of sentiments and ideas, and not alien to its idiom. It is not a book we are reading, but a conversation to which we are listening; and he persuades, because he does not teach." The best edition is that of Coste (3 vols. 4to, London, 1724). His style, though not always pure and correct, accurate and elevated, is original, simple, lively, bold, and vigorous. Besides his Essays, his Voyages deserve mention, although not intended for publication. Montaigne also translated, at the request of his father, a treatise on natural theology, by Raymond Sebonde. There are two English translations of the Essays, one by Charles Cotton, and an earlier one by John Florio.

MONTALEMBERT, Marc René, marquis de, born at Angouleme, in 1714, entered the army in his eighteenth year, served in the campaign of 1733, and distinguished himself at the sieges of the Kehl and Philippsburg. As a reward for his services, the company of the prince of Conti's guards was given him. After the peace, he devoted his leisure to the sciences, and entered the academy in 1747, whose memoirs contain some of his papers, no less remarkable for the originality of their ideas than for their purity and elegance of style. During the seven years' war, he was stationed with the Russian and Swedish armies, and, at later periods, was sent to Brittany and the isle of Oleron, the latter of which he fortified on his new system. In 1779, he erected a wooden fort on the island of Aix, which astonished scientific men by its strength and completeness. His extravagance obliged him, in 1790, to sell his estate in the Angoumois, for which he received payment in assignats, and passed the rest of his life in poverty. As a partisan of the revolution, he (1789) surrendered his pension, which had been conferred on him on account of the loss of an eye. During the stormy period of the revolution, he was imprisoned. He died in 1800. Among his works are *La Fortification perpendiculaire, ou Art défensif supérieur à l'Art offensif* (11 vols. 4to); *Mémoire sur les Affûts de la Marine; Reflèxions sur le Siége de Saint Jean d'Arc; Mémoires ou Correspondence avec les Généraux et les Ministres*, from 1761 to 1791; with some comedies, tales, and *chansons*.

MONTANUS, in the middle of the second century, bishop of Pepuza, in Phrygia, an illiterate man, who gave himself out for the promised Comforter, who was to bring to perfect maturity the Christian system. In his doctrines, he deviates from the received opinions only in maintaining that all true Christians receive the inspirations of the Holy Ghost. The chiliastic or millennarian notions, and his rigid adherence to the letter of the law, he had in common with the Judaizing Christians; and the moral peculiarities of his sect consisted merely in a more strict observance of externals, frequent fasts, the contempt of heathenish learning and worldly conveniences, abstinence from second marriage, and a willingness to submit to celibacy and martyrdom. His disciples called themselves *Pneumatici*, from a belief in their superior spiritual perfection; they were also called *Pepuzians* and *Phrygians*, because their doctrines principally prevailed in Phrygia and Asia Minor in general. Tertullian, himself a Montanist, defends their monastic rigour. On the other hand, the Alexandrian school, which was inclined to the Gnostic dogmas, opposed their fanaticism till they became extinct, in the fourth century, with the exception of some remains which survived a short time in Gaul, where the sect had been introduced by Phrygian colonists.

MONTASSAR. See *Caliph*.

MONTAUBAN; a city of France, in the department Tarn and Garonne, see of a bishop, with some public offices and 26,466 inhabitants. It is finely situated and well built. The cathedral, the episcopal palace, the *hôtel de ville*, and the bridge over the Tarn, are particularly worthy of being seen. Lat. 44° 0′ 55″ N.; lon. 1° 21′ E.; 140 leagues south of Paris. During the religious wars in France, Montauban was a stronghold of the Huguenots, and was besieged in 1580 by Montluc, and in 1621 by the troops of Louis XIII., without success. It suffered severely from the dragonnades, under Louis XIV.

MONTAUK POINT; the eastern extremity of Long Island, New York, in Easthampton; lon. 72° W.; lat. 41° 4′ N.; with a light-house.

MONTBELLIARD (in German, *Mümpelgard*); a city of France, in the department of the Doubs, in a fertile plain, commanded by an old castle, formerly the residence of the princes of Montbelliard; 4600 inhabitants. It was formerly strongly fortified, but Louis XIV. captured it, and demolished the works, in 1674. It was ceded to France, with the territory forming a county of the same name, in 1796. Lon. 6° 44′ E.; lat. 47° 31′ N.

MONTCALM DE SAINT-VERAN, LOUIS JOSEPH, marquis of, lieutenant-general in the French service, was born near Nimes, in 1712; after receiving a careful education, entered the military service in his fifteenth year, and distinguished himself on several occasions. In 1756, he was sent to Canada, as commander-in-chief of the French American colonies; and, although exposed, with a feeble army, to the rigours of a severe climate, and neglected by the mother country, he obtained repeated advantages over lord Loudon in the first campaign, gained a complete victory over Abercromby in the second, and fell, under the walls of Quebec, in 1759, in the battle with Wolfe.

MONTE BELLO; an Austrian town in Vicenza, in Italy, thirteen miles south-west of Vicenza; population 1500. Here was an engagement, in 1796, between the Austrians and French under marshal Lannes (q. v.); hence his title of *duke of Monte Bello*.

MONTE CASINO; a celebrated benedictine abbey in the kingdom of Naples, in the province Terra di Lavoro, near the small town of S. Germano, and about forty-five miles from the city of Naples, founded by St Benedict of Norcia, in 529. It is situated on a mountain, from which it derives its name, near the ruins of the ancient Casinum, and is approached by a well-paved and winding road, the ascent of which occupies about two hours. The abbey, after having suffered repeated reverses, finally became considerable for its privileges and its wealth, and in the eleventh and twelfth centuries was the seat of science, particularly of medicine, the celebrated school of Salerno having been founded by the monks of Monte Casino. The church is very magnificent, although overloaded with ornament, and contains the tomb of the founder; the library is valuable, and there are many valuable pictures belonging to the abbey, particularly in the room and tower which St Benedict is said to have inhabited. The monastery has served as a place of refuge to several sovereigns and pontiffs, and was formerly much visited by pilgrims and travellers, who were entertained free of expense. A *hospitium*, with four monks, was also supported at S. Germano, where travellers were received and provided with mules for continuing their journey to the abbey. At present, the road on which it lies is little frequented; the neighbourhood is infested with robbers, and the old abbey has few visitors. See *Benedict St*, and *Benedictines*.

MONTE CIRCELLO (anciently *Circæum promontorium*, or *jugum*); a mountainous cape of Italy, near the sea, and by the ancients called an island, and celebrated as the habitation of Circe, the sorceress, who used to transform her lovers into brute animals. On this promontory once stood a town called *Circæum*; here was a chapel dedicated to Circe, and an altar to Minerva. Fifty miles south-east of Rome; lon. 12° 57′ E.; lat. 41° 17′ N.

MONTECUCCULI, or, more correctly, MONTECUCCOLI, prince Raymond, one of the greatest military commanders of modern times, born in the Modenese, in 1608, bore arms at first in the capacity of a common soldier, under his uncle, and rose successively through all the ranks. His first brilliant exploit was in 1639, when, by a forced march, at the head of 2000 horse, he surprised a body of 10,000 Swedes, and captured all their artillery and baggage. Baner (q. v.), however, hastened to attack the victor, and made him prisoner. Montecuccoli now passed two years of captivity in the assiduous study of the military art. In 1646, he gained a victory over general Wrangel, at Triebel. After the peace of Westphalia (1648), he visited Sweden, and then returned to Modena, where, at a *carrousel* in honour of the marriage of the duke, he had the misfortune to kill his friend, the count Manzani. In 1657, the emperor of Germany sent him to the aid of John Casimir, king of Poland, against Ragotsky and the Swedes. Montecuccoli defeated the Transylvanians, and drove the Swedish forces from Cracow. Charles Gustavus, king of Sweden, then attacked Denmark; but Montecuccoli hastened to its defence, and relieved Copenhagen by land before the Dutch could introduce reinforcements by sea. The peace which followed this success did not leave him long in retirement: the conqueror of Ragotsky was now employed to protect that prince against the Turks. He compelled them to withdraw from Transylvania, and, by a wise system of delay, baffled all the attempts of their formidable force, until the arrival of the French, by whose aid he gained the great victory of St Gothard (1664). This victory led to a peace, and Montecuccoli was made president of the imperial military council. On the breaking out of the war between the empire and France, he was placed at the head of the imperial troops, and checked the progress of Louis XIV., by the capture of Bonn, and by forming a junction with the prince of Orange, in spite of Turenne and Condé. The next year, the chief command was taken from him, but was restored in 1675, that he might make head against Turenne, on the Rhine. Montecuccoli was the only adversary worthy of that great commander. They spent four months in following and observing each other, each conjecturing the movements of his opponent by what would be his own in the same circumstances, and they were never deceived. They were on the point of risking a battle, when the French general was killed by a cannon ball. (See *Turenne.*) In the letter of Montecuccoli to the emperor, in which he speaks of the death of his great rival, he says that he cannot help regretting the loss of a man who was an honour to human nature: these words he had repeated several times on hearing the news of Turenne's death. The prince of Condé could alone dispute the superiority which that event gave him. The prince was at first worsted, but finally succeeded in making head against the imperial commander, who considered this campaign as the most glorious of his life—not because he conquered, but because he was not conquered. Montecuccoli passed the remainder of his life at the imperial court, the patron of learning, and promoted the establishment of an academy for natural science. He died at Lints, in 1680. His memoirs, written in Italian, are distinguished for conciseness, clearness, and profound and scientific views.

MONTE FIASCONE ; a papal town in the Patrimonio, five miles south of Bolsena, ten north-west of Viterbo; lon. 11° 56′ E.; lat 42° 33′ N.; population 3000; see of a bishop. This is by some said to be the ancient Falerium, or Falerii, capital of the Falisci. It is now remarkable only for its situation, and for the hills surrounding it, which produce great quantities of excellent wine, particularly Muscadel.

MONTEM ; a singular celebration which takes place every three years at Eton school, England See *Eton.*

MONTEMAYOR, Jorge de, a celebrated poet, born about 1520, in the small town of Montemayor, or Montemor, not far from Coimbra, in Portugal. He was much less indebted to study than to his natural genius, but he understood several living languages, and his translations from them are characterized by ease and faithfulness. In his youth, he entered the military career, although his inclination attracted him to music and poetry. He afterwards went to Castile, and, being destitute of other means of subsistence, joined the chapel of Philip II. as a singer, and accompanied that prince to Germany, Italy, and the Low Countries. After his return, he appears to have lived in Leon, where he wrote his celebrated Diana, which constitutes him the founder of the Spanish pastoral romance. Queen Catharine, sister of Charles V., and regent of the kingdom, called the poet to her court, and conferred on him an honourable post. By an elegy of Francisco Marcos Droantes, which is contained in all the editions of the Diana, it appears that he died as early as 1562. Although a Portuguese by birth, he is considered as belonging to Spanish literature, as he wrote in Castilian. Cervantes calls the Diana the finest model of the pastoral romance. Besides that work, which is unfinished, we have a *Cancionero,* or collection of his poems.

MONTENEGRINS ; the inhabitants of Montenegro, a country in the western part of Turkey in Europe, in the province of Albania, between lat. 42° 8′ and 43° 5′ N., and lon. 18° 38′ and 19° 35′ E. In the language of the natives, the country is called *Tschernagora*, and received the name of Montenegro (Black Mountain), from the dark colour of the forests which cover its mountains. The inhabitants are Sclavonians, and are described as bold, warlike, and hospitable, but inclined to robbery. They are estimated at about 60,000, of whom 15,000 are capable of bearing arms. The superficial area of the country is 1000 square miles. This district was never reduced by the Turks, and, in 1797, the inhabitants threw off all dependence on Turkey, and formed an independent state, under the protection of Russia. Their ruler is called *wladika*, and is the spiritual and temporal head of affairs. Their language is Illyrico-Sclavonian. They belong to the Greek church, but have their own patriarch. The principal town is Atigne. In 1767, an adventurer by the name of Steffano Piccolo, made his appearance among them, who gave himself out for the Russian emperor Peter III., and excited an insurrection, which was not pacified without much bloodshed.—See Sommières, *Voyage Historique et Politique de Montenegro* (2 vols., 1820).

MONTE NOTTE ; a mountain in Italy, on the borders of the state of Genoa and the duchy of Monferrat, seven miles north of Savona, twelve south of Acqui. On the 11th of April, 1796, the Austrians, commanded by general Beaulieu, were defeated by the French under Bonaparte; the imperialists lost 2000 men killed, and as many prisoners.

MONTE NUOVO ; a mountain in Naples, thrown up by an earthquake, in the sixteenth century, in the valley of Averno. In forty-eight hours it attained the height of 2100 feet. Some part of it is cultivated. Near the foot of the mountain the sand is very hot from subterraneous fire.

MONTEREAU. See *Chatillon.*

MONTE SANTO. See *Athos.*

MONTEREY, a seaport or bay in New California. Lon. 121° 51′ W. Lat. 36° 36′ N. The bay is spacious, and is situated between Point Pinos, and Point Anno Nuovo. The climate is healthy, but subject to thick fogs.

MONTESPAN, Françoise Athenais de Rochechouart de Mortemart; marchioness de, mistress of Louis XIV., born in 1641, the second daughter of the duke of Mortemart, in 1663, married to the marquis de Montespan. To the most fascinating ing beauty she added a natural liveliness and wit, and a highly cultivated mind. Her conversation was gay, natural, and *piquante.* On her first appearance at court, as the queen's *dame du palais*, Mlle. de la Vallière possessed the favour of the monarch; but the grace, beauty and wit of the lovely marchioness soon made an impression on him (1668), and it was not long concealed from the courtiers—although the pious queen was slow to credit it—that, while that voluptuous prince already had one mistress at court, he was living in double adultery with another. Her husband had been ordered to retire to his estates, and Mme. de la Vallière withdrew in 1674. The first child of this adulterous connexion was born in 1672, and the birth was carefully concealed. The education of the children was committed to Mme. Scarron, afterwards De Maintenon, under the strictest injunctions of secrecy; but this exterior of decency was soon laid aside, and they were openly avowed. The influence of the favourite mistress was often exercised in public affairs, and her advice was often formally asked and followed. Several transient passions of the king still left her her power, until age and long possession, remorse, and a growing attachment to Mme. de Maintenon finally overcame his passion, and the frequent quarrels of the two ladies finally estranged his affections from Mme. de Montespan. She rarely appeared at court after 1685, and, in 1691, she entirely quitted it. Her last years were devoted to religious exercises, acts of benevolence and penitence. She died in 1707.

MONTESQUIEU, Charles de Secondat, (baron de la Brède et de,) was descended from a noble family of Guienne, and was born Jan. 18, 1689, at the castle of Brède, near Bourdeaux. When only twenty years old, this philosophical genius collected materials for his *Esprit des Lois*. An uncle, who was president of the parliament of Bourdeaux, left him his property and office. In this sphere of action, Montesquieu tried to be useful in various ways. In the academy which was formed at Bourdeaux, he delivered many excellent lectures on history, sought to attract attention to the natural sciences, in his time almost entirely neglected, and, for that purpose, projected the plan of a *Histoire physique de la Terre, ancienne et moderne*, (which, however, as his efforts were afterwards turned in other directions, was never finished), &c. In 1721, he came before the public with his *Lettres Persanes*, which he had begun in the country, and finished in the leisure hours that his business left him. This work, profound under the appearance of levity, announced a distinguished writer. It gives a most lively and correct picture of French manners: with a light and bold pencil, he portrays absurdities, prejudices, and vices, and has the skill of imparting to all an original character. All his letters are, however, not of equal value: some contain paradoxes and coarse satires against the reign of Louis XIV. These letters introduced Montesquieu into the French academy, although this society was by no means spared in them; and cardinal Fleury, justly offended at the Persian's mockery of the Christian religion, opposed his reception. The discourse which he delivered on the occasion of his admission, in 1728, was short, but energetic, and rich in ideas. In order to collect materials for his great work, the *Esprit des Lois*, he resigned his office in Bourdeaux, in 1726, and, after his reception into the academy, began to travel through Germany, Hungary, Italy, Switzerland, Holland, and England. In the last country, he spent about two years, and was made member of the royal society of sciences in London. The result of his observation was, that Germany was the place to travel in, Italy to reside in for a time, England to think in, and France to live in.* After his return to his *château la Brède*, he finished his work *Sur les Causes de la Grandeur et de la Décadence des Romains*, which first appeared in 1734. His acute remarks and excellent delineations gave to this trite subject the interest of novelty. The lofty spirit which shines in this book is still more conspicuous in the *Esprit des Lois*, which appeared in 1748. In this work, which exhibits the laws of states, in their broad connexion with the other elements of public life, the author distinguishes three forms of government,—the democratic, the monarchical, and the despotic, and shows that the laws must correspond to the principles of these forms. The distinction is of great importance, and leads the author to a great variety of deductions. The style, without always being correct, is energetic. This work may be termed a code of national law, and its author may be termed the legislator of the human family: we feel that it emanates from a liberal heart, regarding the whole human race with affection. In consideration of these sentiments, Montesquieu may be forgiven for labouring to reduce every thing to a system; ascribing to climate and physical causes too much influence over the morals; for the irregularity of his work as a whole, and for having too often drawn general inferences from single cases. But it has been justly complained that we find in this *chef d'œuvre* many excessively long digressions respecting the feudal laws; also the testimony of travellers of doubtful credit; paradoxes instead of truths, and jests instead of reflections. He has therefore been accused of indefiniteness, forced expressions, and want of connexion. It is, however, undeniable, that this book is for the philosopher a storehouse of investigations; and no one has ever reflected more profoundly than Montesquieu on the nature, foundation, manners, climate, extent, power, and peculiar character of states; on the effects of rewards and punishments; on religion, education, and commerce. To a criticism by the abbé Bonnaire, Montesquieu replied in his *Défense de l'Esprit des Lois*. He died at Paris, Feb. 10, 1755, at the age of sixty-six years. Although economical by nature, he could be generous, as in the well-known instance of his bounty at Marseilles, where he gave his purse to a young boatman, and secretly appropriated a considerable sum to release the father of the unhappy man, who had fallen into the hands of Barbary corsairs. It was not discovered till after Montesquieu's death that he was the liberator of the captive. A note respecting the remittance of a sum of money to a banker, found by his executors among his papers, led to the discovery of this act of liberality. It has given occasion to the drama *Le Bienfait anonyme*. His mildness, good humour, and courteousness, were always equal; his conversation easy, instructive, and entertaining. After his death, a collection of his works was published at London, in 1759, (3 vols., 4to). In 1788, there appeared a good edition (in 5 vols.), to which must be added a volume of *Œuvres Posthumes*, that appeared in 1798. The most complete editions are those of Basle, of 1779, in 8 vols., and of Paris, 1796, in 5 vols. They contain several other works of Montesquieu, such as the *Temple de Gnide*, a kind of poem in prose. A history of Louis XI., which he had composed, was lost, being burned by the author by mistake. Under the name of *Charles d'Outrepont*, Montesquieu has unveiled the soul of a tyrant, in a conversation between Sulla and Eucrates. Of his *Lettres familières*, which appeared in 1767, several are interesting. In his twenty-sixth year, Montesquieu married, and the fruits of this marriage were one son and two daughters. The first published a romance, in 1783, Arsace and Ismene, which was probably written by Montesquieu, in his younger years, and, perhaps, intended originally as Grimm suggests, to form an episode in the *Lettres Persanes*. To his grandson, the baron Montesquieu. who died without children, at London, July 27, 1824, Napoleon, from respect to the author of the *Esprit des Lois*, restored the property of his grandfather, which had been confiscated during the revolution.

MONTE VIDEO, or CISPLATINO; a republic of South America, between Brazil on the east and north, Paraguay on the north-west, and Buenos Ayres on the west, washed by the Uruguay, the Rio de la Plata, and the Atlantic. It was declared an independent republic, by a treaty between Buenos Ayres and Brazil, in 1828. See *Banda Oriental*.

MONTE VIDEO, or S. FELIPE; capital of the republic of Monte Video, on the northern bank of the Rio de la Plata, near its mouth; lat. 34° 54′ S.; lon. 56° 14′ W.; 120 miles north-east of Buenos Ayres. Near the port rises the mountain from which it derives its name, and on which there is a light-house.

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* He was often accustomed to say, jocosely, of his own conduct in his travels, "In France, I was the friend of every body; in England, of nobody; in Italy, I had to compliment every one, and in Germany, drink every where."

The city is built on a gentle ascent, and is fortified; the streets are wide, straight, and well-paved; the houses generally of one story, with flat roofs. The principal building is the cathedral. The climate is moist; storms are frequent in summer, and the cold is severe in the winter months, June, July and August. The port is the best on the Plata. The exports are tallow, hides, and salt beef; imports, manufactured goods, coffee, sugar, &c.; population 10,000. Monte Video was built by a Spanish colony from Buenos Ayres, and was a long time an object of ambition to Portugal. When the former shook off the Spanish yoke, the Brazilian court seized the opportunity of taking possession of it. It was recovered, after a long siege, in 1814, and retaken by the Brazilians in 1821. By the treaty of 1828 it became the capital of a republic of the same name. See *Banda Oriental*.

MONTEZUMA; emperor of Mexico, at the time of the Spanish invasion. In 1519, when Cortes arrived on the coast of Mexico, and expressed his intention of visiting the emperor in his capital, Montezuma sent him a rich present, but forbade his farther advance. Cortes, however, heeded not this prohibition, and the emperor, intimidated, began vainly to negotiate for the departure of the Spaniards. His despotic government having made him many enemies, who willingly joined Cortes, and assisted him in his progress to Mexico, he was obliged to consent to the advance of the Spaniards, to whom he assigned quarters in the town of Cholula, where he plotted their destruction. His plot being discovered, a massacre of the Cholulans followed, and Cortes proceeded to the gates of the capital, before Montezuma was determined how to receive him. His timidity prevailed, and, meeting the Spanish leader in great state, he conducted him with much respect to the quarters allotted to him. The mask was, however, soon removed: Cortes seized Montezuma in the heart of his capital, and kept him as a hostage at the Spanish quarters. (See *Cortes*.) He was at first treated with respect, which was soon changed into insult, and fetters were put on his legs. He was at length obliged to acknowledge his vassalage to the king of Spain, but he could not be brought to change his religion. He was constantly planning how to deliver himself and his countrymen; and when Cortes, with great part of his forces, was obliged to march out to oppose Narvaez, the Mexicans rose up and furiously attacked the Spaniards who remained. The return of their commander alone saved the latter from destruction, and hostilities were going forward, when Montezuma, still the prisoner of the Spaniards, was induced to advance to the battlements of the Spanish fortress, in his royal robes, and attempt to pacify his subjects. His address only excited indignation, and, being struck on the temple with a stone, he fell to the ground. Every attention was paid to him by Cortes, from motives of policy; but, rejecting all nourishment, he tore off his bandages, and soon after expired, spurning every attempt at conversion. This event took place in the summer of 1520. He left two sons and three daughters, who were converted to the Catholic faith.—Charles V. gave a grant of lands, and the title of *count of Montezuma*, to one of the sons, who was the founder of a noble family in Spain. See Robertson's *History of America*.

MONTFAUCON, BERNARD DE, a French Benedictine, of the congregation of St Maur, celebrated as a critic and antiquary, was of noble descent, and was born at the castle of Soulage, in Languedoc, in 1655. When young he engaged in military service, which he quitted, and, in 1675, took the monastic vows. In 1688, he published conjointly with fathers Lopin and Pouget, a volume entitled *Analecta Græca, sive Varia Opuscula*. One of his great undertakings was an edition of the works of Athanasius, which appeared in 1698 (in 3 vols., folio). He then visited Rome, where he exercised the functions of agent-general of the congregation; and, on his return from Rome, published an account of his observations, under the title of *Diarium Italicum;* and, in 1706, a collection of the works of the ancient Greek fathers, with a Latin translation, notes and remarks. In 1708 appeared his *Palæographia Græca, sive de Ortu et Progressu Literarum Græcarum*. Among his subsequent labours are the *Hexapla* of Origen (1713, 2 vols, folio); an edition of the works of Chrysostom (13 vols, folio); and *Les Monuments de la Monarchie Française*. His works in folio alone form forty-four volumes. The most important of his productions is the treasure of classical archæology, entitled *L'Antiquité expliquée et representée en Figures*, with the supplement, 15 volumes, folio, containing 1200 plates. His death took place at the abbey of St Germain-des-Prés, 1741. English translations have been published of the *Diarium Italicum* and *Antiquité expliquée*.

MONTFERRAT (*Monteferrato*); formerly a duchy of Italy, bounded by Piedmont, Genoa, and the Milanese; the capital was Casale. It now belongs to the Sardinian territories. Mention is made of a marquis of Montferrat in 980. It was erected into a duchy by Maximilian, in 1573. In 1631, a part of it was ceded to Savoy, by the duke of Mantua, to whose ancestors Charles V. had granted it in 1536. In 1703, the remainder was annexed to the same duchy, by the emperor. Since that period, it has shared the fate of Savoy. See *Savoy*.

MONTFORT, SIMON DE, earl of Leicester, son of Simon de Montfort, who distinguished himself by his activity, zeal, and severity in the crusade against the Albigenses, was born in France, and, in 1231, retired to England, on account of some dispute with queen Blanche. Henry III. received him very kindly, bestowed upon him the earldom of Leicester, which had formerly belonged to his ancestors, and gave him his sister, the countess dowager of Pembroke, in marriage. Henry soon after appointed him seneschal of Gascony, where he ruled so despotically that the inhabitants sent a deputation to the king, declaring that they would renounce their allegiance if Montfort was not removed. He was accordingly recalled, and, according to some accounts, examined before the lords, but acquitted. A violent personal altercation between the king and the haughty earl ensued, in which the former applied the opprobrious epithet of *traitor* to his subject, and the latter gave his sovereign the lie. A reconciliation was, however, effected, and De Montfort was employed on several occasions, in a diplomatic and military capacity. As the dissatisfaction of the barons with the government assumed a more decided tone, the name of this nobleman is more frequently mentioned. He concerted, with the principal barons, a plan of reform, and, in 1258, they appeared in parliament armed, and demanded that the administration should be put in the hands of twenty-four barons, who were empowered to redress grievances, and to reform the state. These concessions were called the *provisions of Oxford*, the parliament having been holden at that place. The administration of the twenty-four guardians, at the head of whom was Leicester, continued for several years. In 1262, Henry made an attempt to escape from their authority, but was constrained to submit, by the vigour and activity of Leicester, and agreed that their power should be continued during the reign of his successor. This stipulation soon led to new troubles, and both parties finally consented to refer the subject to the arbitration of St Louis. The barons refused to abide by his decision, and hostilities again commenced, which resulted in the triumph of Leicester, at the battle of Lewes. His arrogance and rapacity seem to have raised a powerful party against him among the barons, and, according to some, this was the motive which induced him to summon knights of shires and burgesses to the parliament which convened in 1265. Whatever may have been his motives, however, he thus became the founder of the English house of commons. In the same year he fell, at the battle of Evesham, in which the royal forces were led by prince Edward. (See *Edward I.*) In attempting to rally his troops, by rushing into the midst of the enemy, he was surrounded and slain. His body, after being mutilated in the most barbarous and indecent manner, was laid before lady Mortimer, the wife of his implacable enemy. His memory was long revered by the people, as that of one who died a martyr to the liberties of the realm. During the succeeding reign, this feeling was discouraged, but, in the next generation, he was called *St Simon the Righteous*. Miracles were ascribed to him, and the people murmured that canonization was withheld from him. Though Simon de Montfort was slain, his lifeless remains outraged, and his acts branded as those of a usurper, yet, in spite of authority and prejudice, his bold and fortunate innovation survived. He disclosed to the world (whether conscious or not of the importance of his measure), the great principle of popular representation, which has drawn forth liberty from the walls of single cities, has removed all barriers to the extent of popular governments, and has given them a regularity, order, and vigour which put to shame the boasted energy of despotism.

MONTGOLFIER, Jacques Etienne, the inventor of the balloon, the son of a paper maker, was born at Vidalon-lès-Annonai, in 1745, and, with his elder brother, *Joseph Michael* (born 1740, died 1810), devoted himself to the study of mathematics, mechanics, physics, and chemistry. They carried on the manufactory of their father together, and were the first who made vellum paper. Joseph was also the inventor of the water-ram, which raises water to the height of sixty feet. His brother died in 1799. See *Aeronautics*.

MONTGOMERY, Gabriel count de; a French knight, celebrated for his valour and his fate. In his youth, he was the innocent cause of the death of Henry II. That prince had already broken several lances, at a tournament held in 1559, in honour of the marriage of his daughter Elizabeth with Philip, king of Spain, when he desired to run a tilt with the young Montgomery, then a lieutenant in the Scotch guards. The latter consented with great reluctance, but finally yielded, when he saw that Henry was displeased with his refusal. In the encounter, his lance struck with such violence on the visor of the king, as to raise it, and pass through his head, just above the right eye. The prince died eleven days after, commanding that Montgomery should not be proceeded against on account of the accident. The latter retired to his estate in Normandy, which he left, for a time, to travel, and returned to France at the time of the first civil war, in which he acted as a leader of the Protestants. He defended Rouen with great bravery against the royal army, in 1562, and, on the capture of the city, made his escape to Havre. On the night of St Bartholomew's, he was at Paris, but succeeded in saving himself by flight, and went to England. In 1573, he brought a powerful fleet, partly fitted out at his own expense, to the relief of Rochelle, which was besieged by the Catholics, but did not effect any thing, and, returning to Normandy, connected himself with the Protestant *noblesse* of that province. After several battles, he was obliged to throw himself into the castle of Domfront, where, in spite of a vigorous resistance, he was at length overpowered (May 27, 1574), and made prisoner, by the royalist general Matignon. By the command of Catharine of Medici, Matignon transferred his captive to Paris, where he was beheaded, June 26 of the same year, displaying the most heroic courage on the scaffold.

MONTH; the twelfth part of the year, and so called from the moon, by whose motions it was regulated, being properly the time in which the moon runs through the zodiac. (For the civil division of months, see the articles *Calendar*, and *Epoch*.) The lunar month is either illuminative, periodical, or synodical. *Illuminative month* is the interval between the first appearance of one new moon and that of the next following. As the moon appears sometimes sooner after one change than after another, the quantity of the illuminative month is not always the same. The Turks and Arabs reckon by this month. *Lunar periodical month* is the time in which the moon runs through the zodiac, or returns to the same point again, the quantity of which is 27 days, 7 hours, 43 minutes, 8 seconds. *Lunar synodical month*, called also a *lunation*, is the time between two conjunctions of the moon with the sun, or between two new moons, the quantity of which is 29 days, 12 hours, 44 minutes, 3 seconds, 11 thirds. The ancient Romans used lunar months, and made them alternately of 29 and 30 days. They marked the days of each month by three terms, viz., *calends*, *nones*, and *ides*. *Solar month* is the time in which the sun runs through one entire sign of the ecliptic, the mean quantity of which is 30 days, ten hours, 29 minutes, 5 seconds, being the twelfth part of 365 days, 5 hours, 49 minutes, the mean solar year. *Astronomical*, or *natural month*, is that measured by some exact interval, corresponding to the motion of the sun or moon; such are the lunar and solar months above mentioned. *Civil*, or *common month*, is an interval of a certain number of whole days, approaching nearly to the quantity of some astronomical month. These may be either lunar or solar. The *civil lunar month* consists alternately of 29 and 30 days. Thus will two civil months be equal to two astronomical ones, abating for the odd minutes; and so the new moon will be kept to the first day of such civil months, for a long time together. This was the month in civil or common use among the Jews, Greeks, and Romans, till the time of Julius Cæsar. The *civil solar month* consisted alternately of 30 and 31 days, excepting one month of the 12, which consisted only of 29 days, but every fourth year of 30 days. The form of civil months was introduced by Julius Cæsar. Under Augustus, the sixth month (till then, from its place, called *Sextilis*) received the name *Augustus* (now *August*), in honour of that prince; and, to make the compliment still greater, a day was added to it, which made it consist of 31 days, though till then it had only contained 30 days; to compensate for which a day was taken from February, making it consist of 28 days, and 29 every fourth year. Such are the civil or calendar months now used through Europe.

Month, in English statutes is a lunar month, of 28 days, unless otherwise expressed.

MONTI VINCENZO, one of the most celebrated modern poets of Italy, born at Fusignano, in the territory of Ferrara, about 1753, studied at Ferrara, after which he went to Rome, where he found patrons, and was appointed secretary of Luigi Braschi, nephew of the pope. As he wore the clerical dress, he was called *abbate Monti*. The Arcadia received him as a member. Excited by the fame of Alfieri, he wrote two tragedies—*Galeotto Manfredo*, and *Aristodemo*—the splendid style of which was indeed admired, but the plots were thought too tragic, and dramatic action was wanting. The murder of the French ambassador Basseville, at Rome, gave occasion to the poem *Basvilliana*, in which he closely imitates Dante. This work, distinguished for the splendour of some of its passages, gained him a well-deserved reputation. Two other poems, the *Musogonia* and *Feroniade*, are less known in their original form, for, the French having soon after entered Rome, the author suppressed the first edition, and prepared a second, in which the reproaches formerly directed against Bonaparte and his army were levelled against the allied princes. Monti was now appointed secretary of the directory of the Cisalpine republic in Milan. He was accused, indeed, of having acted, on a mission to Romagna, the part of a new Verres; but his verses, in which he artfully flattered the existing powers, kept him in office. The campaign of Suwaroff in Italy, in 1799, obliged him to flee to France. The battle of Marengo restored him to Milan, where he sung the Death of Mascheroni. This poem excited almost as much admiration as the *Basvilliana*, but, as some satirical hits gave offence, he did not finish it. He was scarcely appointed professor of belles-lettres at the college of Brera when he received an invitation to Pavia, as professor of eloquence; but Napoleon appointed him historiographer of the kingdom of Italy, with the charge of celebrating his achievements. Accordingly the poet composed his *Bardo della Selva nera*, of which six cantos appeared in 1806. This very singular work met with strong disapprobation, against which Monti attempted a vindication, in a letter to Bettinelli. He then went to Naples to join Joseph Bonaparte, where he published the seventh canto of the *Bardo*, which was received with no more approbation. His tragedy *Cajo Gracco* likewise found little favour, as also some musical dramas. The poetry was considered as too close an imitation of Dante, though not without many beauties. Monti now translated the Satires of Juvenal, and (without, as he confessed himself, understanding Greek) the Iliad of Homer. In 1815, he composed for the city of Milan a cantata in honour of the emperor Francis. He died in October, 1828. Monti cannot be denied the praise of great poetic talent; his countrymen called him *il Dante engentilito*. His *Proposta di alcune Correzioni ed Aggiunte al Vocabolario della Crusca* contains a treasure of critical and lexicographical information on the Italian language. A complete edition of his works, with a notice of his life, has been announced by his daughter.

MONTMARTRE; a village and height near Paris, rendered celebrated in recent history by the military events of which it was the theatre during the two occupations of the French capital by the allied forces. According to some, it derives its name (*Mons Martis*) from a temple of Mars which formerly stood on its summit; it was afterwards called *Mons Mercurii* (probably because the temple was converted to his service); and, at a later period, in consequence of the death of St Denis and his disciples here, it acquired the name of *Mons Martyrum*; and a chapel took the place of the heathen temple. In the war with Lothaire (978), the chronicles relate that Otho II., emperor of Germany, caused a hallelujah to be chanted by the monks from the heights of Montmartre, with such a power of lungs as to terrify all Paris. In 1096, Bouchard de Montmorency, to whom it belonged, founded a convent of monks here, which, in 1133, was converted into a nunnery by queen Adélaide (wife of Louis le Gros). This abbey afterwards became noted for the dissolute manners of its inmates. Henry IV., during the siege of Paris, fixed his headquarters here. When the allies entered France, in 1814, Napoleon caused the heights to be fortified; and about 15,000 men defended it a whole day against 40,000 of the allied troops. Montmartre was again fortified in 1815, but was not attacked. It affords a good view of the capital, and is occupied by country-seats and several charitable institutions and manufactories. Large quantities of plaster of Paris are obtained from its quarries.

MONTMIRAIL, Battle of, in 1814. See *Chatillon*.

MONTMORENCY, or ENGHIEN; a village about nine miles from Paris, situated on a rising ground, which overlooks the celebrated valley of Montmorency, on the borders of the forest of the same name. In this beautiful valley is the hermitage where Rousseau wrote his *Emile*, and his *Nouvelle Héloïse*, and which was afterwards occupied by Grétry. The garden attached to it contains a bust of the former, and a marble monument to the memory of the latter. Montmorency is now a watering-place, containing sulphureous springs, which supply 400 baths a day. The vicinity affords agreeable walks.

MONTMORENCY, Anne de, peer, marshal, and constable of France, born in 1493, one of the greatest generals of the sixteenth century, distinguished himself under Francis I. in the wars against Charles V., and followed his sovereign to Italy, where he was made prisoner with him at the battle of Pavia (1525), which was fought against his advice. Francis conferred on him the dignity of constable in 1538, on account of his important public services. He afterwards, however, lost the favour of the king, on account of his having advised him to trust to the professions of Charles, who, while in France, promised the restoration of Milan. In the reign of Henry II., Montmorency recovered his former influence, but, owing to the hatred of Catharine of Medici, lost his consideration in the reign of Francis II. The risings of the Huguenots occasioned his recall to the court of Charles IX., and he joined the duke of Guise in opposition to Condé, who was at the head of the Protestants. The consequence was a civil war, which broke out in 1562. In the battle of Dreux, Montmorency was made prisoner by the Huguenots, and Condé was captured by the royal troops. The former was liberated the next year, and in the second civil war gained a decisive victory over the Huguenots, November 10, 1567, but died of the wounds received in the action, at the age of seventy-four years.

MONTMORENCY, Henry II., duke de, born 1595, was in his eighteenth year created admiral of France. After having defeated the Calvinists in Languedoc, and taken from them several strong places, he gained a victory over them by sea, near the island of Ré, which fell into his hands. In 1628, he gained decisive advantages over the duke de Rohan, leader of the Huguenots. During the war against Mantua, in 1630, he held the chief command in Piedmont, and defeated the Spaniards under Doria, although they were superior to him in number. This victory was followed by the relief of Casale, and his services were rewarded with the marshal's baton. Montmorency now thought himself powerful enough to brave the influence of Richelieu, and, with Gaston, duke of Orleans, who was equally dissatisfied with the cardinal, raised the standard of rebellion in Languedoc. La Force and Schomberg were sent against them; they met at Castelnaudary, and Montmorency, who, to inspirit his men, had thrown himself into the royal ranks, was wounded and made prisoner. Gaston remained inactive. All France, mindful of his services, his virtues, and his victories, desired that the rigour of the laws might be softened in his favour; but Richelieu was resolved to make an example of the bravest, most generous and most amiable man in France, and the marshal was condemned to death by the parliament of Toulouse. The king extended his mercy so far as to allow the execution to be private, and it took place in the *hôtel de ville*, in Toulouse, October 30, 1632.

MONTMORENCY, Falls of; a beautiful cascade, on a river of the same name, in Lower Canada, seven miles below Quebec. The falls are very near the junction of this river with the St Lawrence. The breadth of the river at the top of the cascade is about 100 feet, and the perpendicular descent 246 feet.

MONTPELLIER; a city of France, capital of Hérault; lon. 3° 53′ E.; lat. 43° 36′ N.; 70 miles north-west of Marseilles, 375 miles from Paris. It is an episcopal see. Population, 35,850. It is situated five miles from the sea, between the small rivers Masson and Lez, on a declivity. Many of the streets are steep and irregular, and in the interior of the town they are winding, narrow, and dark. In the suburbs are the most regular streets, and the best houses; the buildings are mostly of stone. It contains a cathedral, numerous churches, hospitals, and other charitable institutions. The public promenade, called *Peyrou*, is one of the finest in Europe; an equestrian statue of Louis XIV. was erected in it in 1829. Montpellier has long been the seat of a celebrated university, particularly famous for its school of medicine; this still subsists, under the name of an academy, and has three faculties. The anatomical theatre is capable of containing 2000 persons. Other establishments are a botanical garden museum, cabinet of natural history and anatomy, the observatory, and public library of 35,000 volumes and many valuable manuscripts. It is defended by a citadel, which commands the town and neighbourhood. The principal manufacture is verdigris, in which it carries on a considerable trade, as also in wool, which is brought from the Mediterranean; wine, aqua vitæ, Hungary water, cinnamon water, essence of bergamot, lemons, &c., and likewise great quantities of woollen carpets, fustians, and silk stockings. These commodities are sent by the canal to Cette, which is the seaport of Montpellier. This town is particularly celebrated for the salubrity of its air, and for its extensive and interesting prospects, which on the one hand embrace the Pyrenees, and on the other the Alps. It is much visited by invalids from foreign countries.

MONTPENSIER, Ann Maria Louise, of Orleans (usually known as mademoiselle de), was born at Paris in 1627. Her father, Gaston, duke of Orleans, bequeathed his eccentric, impetuous, and vindictive temper to his daughter. She joined the faction of Condé in the war of the Fronde, and had the boldness to fire upon the troops of Louis XIV. from the Bastile. This outrage awakened the hostility of the king and the court against her, so that they opposed every plan of marriage which was agreeable to her, and made only such propositions as she could not but refuse. At the age of forty-four, she determined to give her hand to count Lauzun. She obtained permission to take this step, and brought him a fortune of 20,000,000 of francs, four duchies, the seigneury of Dombes, the county of Eu, and the palace of Luxembourg. The contract was already concluded when the queen and the prince of Condé persuaded Louis XIV. to retract his consent. It has been supposed, however, that the parties were secretly married; but it is not settled whether it was before or after the ten years' imprisonment of Lauzun, at Pignerol, for his conduct towards Mad. Montespan. He finally obtained his freedom on condition that the duchess should cede the seigneury of Dombes and the county of Eu to the duke of Maine. She gladly consented to this sacrifice for the sake of living with him; but her happiness was of short duration. Lauzun saw in her a violent and ambitious woman, yet glowing with the passions of youth, and she looked upon him as ungrateful, perfidious, and false. His insolence finally so exasperated the princess, that she forbade him ever to appear again in her presence. She lived in retirement from that time, and died in 1693, little regretted and almost forgotten. Her Memoirs are interesting.

MONTREAL; a city of Lower Canada, the first in size, and the second in rank, in that province. It is in a district of the same name, and on the south side of the island of Montreal, in the St Lawrence, at the head of ship navigation. It is 180 miles above Quebec, 200 below lake Ontario, 243 from Albany, and 300 from Boston; lat. 45° 30′ N.; lon. 73° 22′ W.; population, in 1821, 18,767; in 1830, about 25,000. The harbour, though not large, is always secure for shipping during the time that the river is not frozen; and vessels drawing fifteen feet of water can lie close to the shore. The general depth of water is from three to four and a half fathoms. The greatest inconvenience is the rapid of St Mary, about a mile below the city: vessels cannot ascend this without a strong wind from the north-east. Montreal is divided into Upper and Lower town, but one is very little elevated above the other. The streets are for the most part laid out in a regular manner, generally rather narrow, excepting the new ones. The houses are mostly built of grayish stone, with roofs covered with sheet-iron or tin. Many of them are large and handsome, and in modern style. The principal public buildings are the general hospital, the Hotel Dieu, the convent of Notre Dame, a magnificent French cathedral, an English church, the Catholic seminary, the Protestant college, the court-house, and the government-house. Montreal is the great emporium of the fur trade, which is of vast extent and importance. It is also the channel through which commerce is carried on between Canada and the United States. A canal, nine miles long, has been completed around one of the rapids below the city, called the *Lachine canal*. A regular steamboat communication is kept up, during the summer, between Montreal and Quebec. A great portion of the inhabitants are of French descent; and the French and English languages are about equally spoken in the transaction of ordinary business, and even in the courts of justice. There is a college at Montreal, styled *university of M'Gill college*, endowed by the late honourable James M'Gill, and chartered in 1821. Its governors are the governor in chief, the lieutenant-governors of Lower and Upper Canada, the lord bishop of Quebec, the chief-justice of Upper Canada, and the chief-justice of Montreal, for the time being. It has a principal and eight professors. There is another institution, called the *college of Montreal*, which has a principal and four professors. The mechanics' institution, the natural history society, the library of 8000 volumes, and the advocates' library, are of great utility.

MONTREAL; an island of Lower Canada, in the river St Lawrence, at the confluence of Ottawa river, thirty-two miles long and ten and a half broad. It forms the county of Montreal, and is divided into nine parishes. In general, its surface is level, and it is extremely fertile. The largest mountain on the island is one mile distant from the city. The base is surrounded by neat country houses and gardens, and the mountain itself is covered with lofty trees. The view, from this elevation, embraces the city, the river, and a wide extent of the surrounding country.

MONTROSE, JAMES GRAHAM, marquis of, a distinguished royalist under Charles I., descended from the royal family of Scotland. He entered the Scotch guards in France. On his return, he excited the jealousy of the marquis of Hamilton, in consequence of which he met with such neglect that he joined the covenanters; but, afterwards returning to the royal side, he was zealous in his service of the king, and gained the battles of Perth, Aberdeen, and Inverlochy, in recompense for which he was created a marquis. In 1645, being defeated by Lesley, he left the kingdom, and remained abroad until 1650, when he came to Orkney, with a few followers; but, being taken, he was conveyed to Edinburgh, where he was hanged and quartered, May 21, 1650.

MONTROUGE; a village of France, near Paris, at which is the entrance to the vast catacombs (q. v.), which extend under a part of Paris, and contain the bones of twenty generations. The remains of the French army, after the battle of Waterloo, were rallied on the plains of Montrouge.

MONTSERRAT; one of the Little Antilles, or Caribbee islands, belonging to Britain; lat. 16° 47′ N.; lon. 62° 15′ W. It is about nine miles long, and nearly as wide, and contains 30,000 acres, of which two thirds are mountainous and barren. The exports are sugar, rum, cotton, and indigo; the population, 8000, of which 6500 are slaves. Plymouth is the chief place. The island was discovered by Columbus, in 1493, and colonized by the British, in 1632.

MONTSERRAT (*Monserrado*); a mountain in Spain, in the province of Catalonia, twenty-four miles south-west of Barcelona, which has its name from its numerous peaks, resembling the teeth of a saw. It is famous for its ancient Benedictine monastery, which was partly destroyed, in 1812, by the French. The monastery is composed, in part, of thirteen hermitages, which are accessible only by steps hewn out of the steep rock. The youngest monks occupy the highest, at an elevation of 3000 or 4000 feet. They are supplied with provisions from the monastery, by mules trained for the purpose; they hear the sound of the bells, the music of the organ, and the singing of the choir, but assemble only on festival days to perform divine service in the monastic chapel. Many of these hermits have only room for a small hut; others have also a small garden. Some of their dwellings appear to be suspended in the air, and can be approached only by means of ladders and bridges, over terrible precipices. The inmates gradually descend as the tenants below them die off, until they inherit a place in the monastery which contains the tombs. The mountain is full of narrow passes, many of which are fortified. The image of the virgin, pretended to have been found in a cave in the ninth century, draws many pilgrims thither.

MONTUCCI, ANTONIO, one of the most learned Chinese scholars in Europe, born at Sienna, in 1769, studied at the university there, devoting himself to the living languages with almost incredible application. In 1785, he was made professor of English at the college Tolmei, and, in 1789, accompanied Mr Wedgwood to England as Italian teacher in his family. Here he became acquainted with four young Chinese, obtained from them a copy of the Chinese dictionary *Tching Tseu Thoung*, which was not before known in Europe, and soon formed the plan of preparing a new dictionary of the Chinese language. To meet the expense, he laid his prospectus before several princes and academies, but the king of Prussia was the only person who made him an answer. He set out for Prussia; but the expedition of Napoleon (1806) disappointed his expectations of aid from the Prussian court. He continued, however, to labour on his dictionary, supporting himself by giving lessons in English and Italian. In 1812, he went to Dresden, where he continued to teach, and lectured on the Chinese language and literature. In 1827, he returned to Italy, and died in 1829. His dictionary and a part of his Chinese library had been previously purchased by Leo XII., for the instruction of the missionaries in the Vatican. He was also the author of several compilations, &c., for the study of Italian, and edited the *Poesie inedite* of Lorenzo de' Medici, published at the expense of Roscoe (Liverpool, 1790.)

MONTUCLA, JOHN STEPHEN; an eminent French mathematician, born at Lyons, in 1725, studied in the college of the Jesuits, and completed his education at Toulouse, with a view to the legal profession. He then engaged in practice as a counsellor, but afterwards devoted himself to the cultivation of mathematical science. He published a treatise on the quadrature of the circle; and in 1758, appeared his *Histoire des Mathématiques* (2 vols., 4to)—a work of great research and ability. He was appointed secretary to the intendant of Grenoble, and subsequently went to Cayenne, with the title of royal astronomer. The latter part of his life was devoted to the augmentation of his history, of which a new edition was published at Paris, in 4 volumes, 4to. in 1799; reprinted in 1810. Montucla also published an enlarged edition of the *Récréations Mathématiques et Physiques* of Ozanam, an English translation of which, by doctor Charles Hutton, appeared in 1803 (4 vols., 8vo). His death took place in 1799.

MONUMENT, in its widest sense, includes every thing by which the memory of a person, period, or event is perpetuated. Monuments of antiquity include writings as well as the productions of the fine and useful arts; for Homer's poems are equally a monument of his time, as the Pantheon or the domestic utensils found amongst the ruins of Pompeii. These monuments are of the greatest interest, leading us back into former ages, and presenting the manners, customs, and institutions of the people. Some are valuable only in their character of memorials, that is, as preserving the memory of certain persons or events; others have an intrinsic value as works of the fine arts. (See *Antiquity*, *Antique*, &c.) The productions of sculpture and architecture, intended to transmit to posterity the memory of remarkable individuals or events, are most generally understood by the term monuments of antiquity. Such as ornament public places, gardens, &c., are chiefly in commemoration of great events. Among the monuments in honour of individuals are tombs and sepulchral edifices or columns. In all ages, and with every nation, we find this description of monument, from the first rude attempts of art to its greatest perfection. The most ancient known to us are the obelisks and pyramids of Egypt, and, perhaps, contemporary with these, the tombs of the Persian kings, which are still beheld with admiration in the ruins of Persepolis. These monuments command our awe by their grandeur and simplicity, in which they are, perhaps, superior to similar works of Grecian art, though the latter excel them in beauty. Hardly any country offered so great a number of monuments as Greece, where they were erected in honour of the victors in battle, and in the solemn games, and of other distinguished men, but were often also thrown away on the undeserving. The warrior had statues and trophies; the victor in the games had statues and pillars. On the isthmus of Corinth, near the temple of Neptune, were statues of the victors in the Isthmian games; in the holy grove of Altis, near Olympia, were those of the victors in the Olympic games. There were also many trophies. Buildings were frequently erected in commemoration of distinguished persons or events, which differed greatly in form and splendour. Thus, in Athens, the choragic monuments were erected in honour of those who had received the prizes as *choragi* in the theatrical and musical games. In these games it was customary for each of the ten guilds of Athens to select one *choragus*, who, at his own expense, undertook the regulation and superintendence of the games. Each endeavoured to surpass the other; the conqueror received a tripod of brass as the prize, which was usually the work of a great artist, and was regarded as an honour to his family. This prize was publicly placed on a small edifice or a single pillar, on which the name of the *choragus* and the date of the games were inscribed. A particular street in Athens was appropriated to these monuments, called the street of *tripods*. Some of these have been preserved to our time. The most splendid of all, and the most ornamented, is the choragic monument of Lysicrates, usually called the *lantern of Demosthenes*; next to this, the monument of Thrasyllus and Thrasycles, and some pillars. The Romans, who contended with the Greeks in the arts, were equally successful in monuments, of which one species is entirely theirs—the triumphal arch. (See *Triumphal Arch*.) The earliest tombs in Greece and Rome were either erected on the spot where the ashes of the deceased were deposited, or in some other place chosen at pleasure. These latter were termed *cenotaphs*. Both kinds were found in the cities or their vicinity, and scattered along the roads, which they ornamented. The rude stone was by degrees transformed into a noble pillar; subsequently, on a foundation of stone, two small pillars were erected, covered with a pediment, and the intermediate space was destined for the images of the deceased, inscriptions, and bass-reliefs. Small buildings in the form of temples followed, and these, in time, increased in magnificence. The greatest monument of this description was the (so called) *mausoleum* (see *Artemisia*), after which splendid sepulchres are still called *mausoleums*. Modern Europe presents monuments of both kinds. The public monuments commemorative of great events are principally in the capitals, and many of these are described and represented in Sturm's *Architektonische Reiseanmerkungen*. A tolerably good collection was given by the abbé de Lubersac, in his *Discours sur les Monumens publics de tous les Ages et de tous les Peuples* (Paris, 1776, folio). Many of the monuments of France are represented in Millin's *Antiquités Nationales*. The royal *Académie des Inscriptions* has contributed to turn the attention of the French artists to this subject.

MONZA; a city of the Lombardo-Venetian kingdom, seven miles from Milan, on the Lambro. Its beautiful edifices show that it was once a royal residence; the streets are regular and well paved, and there are several handsome palaces, among which that of Mirabello contains many fine paintings and works of sculpture. The cathedral erected by Theodelinda, queen of the Lombards, in the seventh century, is worthy of mention: among its curiosities is the iron crown of the Lombard kings, with the inscription *Guai a chi la tocca*, which Napoleon placed upon his head in 1805, with the words *Dieu me la donne; gare à qui la touche*. The population is 10,500. It was formerly the residence of the kings of Lombardy.

MOON is the name given to the satellites which revolve round the primary planets and illuminate them with light reflected from the sun. In common language, we mean by *moon* the particular satellite of our earth. Like the other heavenly bodies, it daily alters its apparent position among the fixed stars, and, in the course of a month, appears to make a complete revolution round the heavens, from west to east, while, at the same time, it has, like the fixed stars, an apparent daily motion from east to west. Among all the heavenly bodies, the moon is the nearest to us. Its mean distance is estimated at about thirty times the diameter of the terrestrial equator, or 237,000 miles. The point at which it approaches nearest the earth is called its *perigee*; the point of its greatest distance is called the *apogee*. It passes through both these points in each revolution. According as it is nearer to, or farther from the earth, its diameter, as seen from the earth, appears larger or smaller. At its mean distance this amounts to thirty-one minutes and nine seconds. Astronomers make the moon's actual diameter 3$\frac{2}{3}$ times smaller than that of the earth; therefore the superficies of the moon equals but $\frac{1}{14}$ of the earth's, and its solid contents equals but $\frac{1}{49}$. In the moon's revolution great inequalities are remarked. These arise mostly from the strong attraction of the sun in the various positions which it assumes relatively to the earth. This was first understood after Newton's discovery of the universality of the law of gravity. Tobias Mayer published the first accurate lunar tables. As the moon completes her revolution about the earth in twenty-seven days, eight hours, or more accurately, in twenty-seven days, seven hours, forty-three minutes, five seconds, it passes daily, on an average, through 13° 10′ 35″ of its course. Besides the double motion of the moon round our earth, and with the earth round the sun, it also revolves on its own axis. It completes a revolution on its own axis in the same time with its revolution round the earth, as appears from its always presenting the same side to the earth. In consequence of this remarkable coincidence, the earth must appear to a spectator on the moon to be always in the zenith. One side of the moon, moreover, never receives the reflection of the sun's rays from the earth, while the other is constantly illuminated by it; both sides, however, are equally illumined by the direct rays of the sun. Some little irregularity has been perceived in the surface of the moon presented to the earth, its spots sometimes appearing more to the north, at others more to the south; a similar variation is perceived east and west. This phenomenon is denominated the *libration* of the moon in latitude and longitude. The causes of both have been discovered. (See *Libration*.) Of all the heavenly bodies, the moon, from its comparative proximity to the earth, is the one of which most is known. That it is an opaque body, receiving its light from the sun, is evident from the phenomena of solar and lunar eclipses, but more particularly from the various phases which it presents. Even the naked eye discovers, on the illuminated surface of the moon, several spots, more or less bright; and a good telescope shows us, in the bright parts on the limits of illumination, prominences and depressions, which are regarded as mountains and valleys. The numerous observations of Herschel and Schroter, through a number of years, have put the existence of these beyond dispute: Schroter has even undertaken to determine the elevation of mountains in the moon. The two heights on the southern limb, which he called *Leibnitz* and *Dorfel*, he measured by means of the shade which they cast, knowing, at the same time, the sun's elevation with regard to them, and found them to be 26,650 feet high; therefore almost as high as the most elevated summits of the Himalaya. The large dark spots appear, when intersected by the frontier line of illumination, always even and without prominences. Hence they are supposed to be plains, consisting of a substance which has comparatively little power of reflecting the sun's rays. That they are seas, is not probable, since Huyghens observed great depressions in them, and Schroter, in several of these depressions, discovered evident traces of various horizontal strata, lying one upon the other, and forming a wall around them. Schroter, who measured several of these depressions, found their diameter to be from thirty feet to more than half a mile; the diameter of one, in fact, was above sixteen miles, and its depth 30,000 fathoms. The number of spots on the moon was formerly considered to be 244. Schroter has increased their number to 6000, and accurately observed and described many of them. There is no appearance of water in the moon. The depressions, with their walls and surrounding mountains, Schroter regards as craters. The large grey spots appear to him regions which have suffered less, and in which, perhaps, some vegetation exists. He has also observed other changes on the moon's surface, which he considered to be of volcanic origin. From all appearances, it would seem that the surface of the moon is still subjected to great revolutions. Perhaps it is still torn open or thrown up in prominences by violent volcanoes and earthquakes in the interior, as may have once been the case with our earth also. Such revolutions have been supposed to afford a means of accounting for the fall of meteoric stones on the surface of our earth, the power of a volcano in the moon being supposed sufficiently great to throw such masses out of the sphere of the moon's attraction into that of the earth. (See *Meteoric Stones*.) The shepherd Endymion, according to Pliny, first observed the course of the moon and its changes. Hence the story of Endymion and Diana. Even the Chaldeans considered the moon as the smallest among the heavenly bodies and the nearest to the earth; they knew that her light was borrowed, fixed her periodical phases with much accuracy, and attributed her eclipses to the shadow of the earth. That the moon was inhabited, was conjectured by Orpheus, or rather by the author of the verses which exist under his name; and Pherecydes of Scyros, a contemporary of Servius Tullius, is said to have determined the time of her revolution. The Pythagoreans affirmed that the moon contained mountains, cities, plants, animals, and men. Anaximander knew the size of the moon, its distance from the earth, and that its light was borrowed from the sun. The spots on its surface Clearchus considered to be seas. In modern times, this planet has occupied much of the attention of astronomers. The question whether the moon has an atmosphere has been settled by Schroter in the affirmative.—See the article on the moon's atmosphere, in the first volume of Gehler's *Physikal. Wörterbuch* (Leipsic, 1825).

Doctor Francis von Paula Gruithuisen, professor of astronomy at Munich, has, of late years, paid great attention to the moon, and his discoveries and hypotheses, though wanting confirmation, have excited much interest. In his opinion, the straight lines, often of considerable length and a parallel direction, which have been observed on its surface, and which are made up of objects resembling, in shape, a star, an inverted Z, &c., are, in fact, roads, with cities, temples, dwellings, &c. At present, however, these conjectures can hardly be regarded as more than creations of a lively imagination. The *Topographie der sichtbaren Mondoberfläche*, by W. G. Lohrmann (Leipsic, 1824, 4to), represents the elevations and colours of the moon's surface with fidelity, and in such a manner as not to be affected by the libration or the different degrees of illumination.—See also Drobisch's *De vera Lunæ Figura*, and his *Symbola ad Selenographiam mathematicam* (Leipsic, 1826).

The various appearances which the moon periodically presents in the different parts of its revolution, are termed *phases*, and arise from the different positions which its opaque mass assumes in relation to the sun and the earth. Every one knows that, at a certain period of the moon's revolution, it is invisible; at other times, it appears of a sickle shape, then semicircular, and finally presents a complete circular disk. When the moon is between the sun and the earth (in which case the sun and moon are said to be in conjunction), it presents its unillumined side to us, and we can see nothing of it. In this state it is called the *new moon*. Soon after, it recedes from the sun, and a small part of its illumined surface becomes visible in the evening horizon. Four days after the time of new moon, it has receded 45° from the sun; and now a portion of its illumined surface is seen in the shape of a sickle, with the horns towards the sun. The moon now departs every day farther from the sun, moving in a direction from west to east, and therefore appears every evening nearer the eastern horizon, and the sickle shaped figure grows daily broader. After about eight days from the time of new moon, it has departed 90° from the sun, and now shows a bright semicircular disk. In this state the almanacs say the moon is in its *first quarter*. Departing continually farther, the illumined portion continually increases, and assumes more and more of a circular figure, until, about fifteen days after the time of new moon, when it stands directly opposite the sun, it presents a complete circular disk. In this state we call it the *full moon*. At this time, it rises when the sun sets, and shines the whole night through. From new moon to full moon, it is said to *wax* (increase). From the day of full moon, it decreases, with each successive day, on the side most distant from the sun, as it is now approaching the sun at the same rate as it before departed. In the course of seven or eight days, it has again arrived within 90° of the sun, and now shows but half its disk on the left side, and is said to be in its *last quarter*. At this time, it rises at midnight. It now shows less and less of its illumined surface, and finally assumes the sickle shape, with the horns, however, turned from the sun; rises later and later, and at the end of about twenty-nine days from the time of new moon again comes into conjunction with the sun, disappears, and commences a new revolution. From full moon to new moon, it is said to *wane*. The moon, when new and full, is said to be in its *syzygies*, and its appearances at the different quarters are called *changes*. As well before as after new moon, the naked eye can discern a pale light on the portion of the disk not illumined by the sun. This is reflected from the earth; for, at the time when it is most perceptible, the sun has not yet set, in the afternoon, and in the forenoon has been up for some time. The inhabitants of the moon, therefore, at such times, see our earth as an illumined disk in the heavens, fourteen times larger than the moon appears to us.

Age of the moon is the number of days since the new moon, which is found by the following rule: To the epact add the number and day of the month, which will be the age required, if less than thirty; and if it exceed thirty, subtract this number from it, and the remainder will be the age. See *Epact*.

Harvest moon is a remarkable phenomenon relating to the rising of this luminary in the harvest season. During the time she is full, and for a few days before and after, in all, about a week, there is less difference in the time of her rising between any two successive nights than when she is full in any other month of the year. By this means she affords an immediate supply of light after sunset, which is very beneficial in gathering in the fruits of the earth; and hence it is, that this lunation has been termed the *harvest moon*. In order to conceive this phenomenon, it must first be considered, that the moon is always opposite to the sun when she is full; that she is full in the signs Pisces and Aries in our harvest months, these being the signs opposite to Virgo and Libra, the signs occupied by the sun about the same season; and because those parts of the ecliptic rise in a shorter space of time than others (as may easily be shown and illustrated by the celestial globe), the moon when she is about her full in harvest, rises with less difference of time, or more immediately after sunset, than when she is full at other seasons of the year.

Moon dial is a dial which shows the hours of the night by the light of the moon.

MOON, Mountains of the, or Donga Mountains; a chain of mountains in the central part of Africa, S. E. of Nigritia, which it divides from unknown regions. It is supposed, with much probability, to be connected with the Abyssinian mountains, and was formerly thought to stretch across the continent, and form a junction with the mountains of Kong; but the Niger is now known to flow between them. Travellers have reported that the summits were covered with perpetual snow, which, in that latitude (about 7 or 8° N.), would require an elevation of 14,500 feet. This range was known to the ancients, and is mentioned by Ptolemy, under the name of *mountains of the moon*, which has been retained by the moderns.

MOOR, To; to confine or secure a ship in a particular station by chains or cables, which are either fastened to the adjacent shore, or to anchors in the bottom. A ship is never said to be moored when she rides by a single anchor.

MOORE, Edward, an English poet and dramatic writer of the last century. He was the son of a dissenting clergyman at Abingdon in Berkshire, where he was born in 1712. He was brought up to the business of a linen-draper, which he carried on for some time in the metropolis. In 1744 he published Fables for the Female Sex; and having been noticed by lord Lyttelton, he complimented that nobleman in a poetical piece, entitled The Trial of Selim. His dramatic works are, The Foundling, a comedy, 1748; Gil Blas, another comic drama; and The Gamester, a tragedy, 1753; all acted at Drury-lane theatre. The two former had little success; but the last became a stock piece, and it is perhaps one of the best examples of a domestic tragedy which our literature affords. Mr Moore engaged in conducting a periodical paper, called The World, to which lords Lyttelton, Chesterfield, Bath, and Cork, Mr H. Walpole, R. O. Cambridge, and Soame Jenyns, became contributors. The last number of the World was published on the day of the editor's death, Feb. 17th, 1757. The literary reputation of Moore rests on his tragedy and his fables, the latter of which have less humour and point than those of Gay, and are also inferior to his other compositions, in ease and elegance of style; but they exhibit lessons of morality in pleasing language, and have become deservedly popular.

MOORE, John, a physician, distinguished as a cultivater of polite literature, was the son of an episcopal divine, and born in 1730, at Stirling in North Britain. He became a student at the university of Glasgow, and having obtained a knowledge of medicine and surgery, he went to the Netherlands in 1747, and served as a mate in the military hospitals. Peace taking place, he became household surgeon to the British ambassador at Paris; and afterwards returning to Scotland, he practised as a surgeon till 1772, when he took the degree of M.D. at Glasgow. He was soon after engaged by the duchess of Argyle, as medical attendant to her son, (the late duke of Hamilton,) who was in a delicate state of health, and whom he accompanied to the continent, and spent there five years in travelling. In 1778 he returned to London, and in the following year published A View of Society and Manners in France, Switzerland, and Germany, 2 vols. 8vo, which passed through numerous editions, and has been translated into several foreign languages. In 1781 appeared his View of Society and Manners in Italy, 2 vols.; and in 1785, a volume, entitled Medical Sketches. The next production of his pen, was Zeluco, a novel, containing interesting delineations of Italian character and manners. In 1795, he published A View of the Causes and Progress of the French Revolution, 2 vols. 8vo, describing scenes which he had witnessed during a residence at Paris. The following year he produced a novel, entitled Edward, or various Views of Human Nature; and in 1800, another, called Mordaunt, or Sketches of Life, Character, and Manners in various Countries. He also published a collective edition of the works of his countryman Smollett, with the life of the author. Dr Moore died at Richmond in Surrey, February 20th, 1802.

MOORE, Sir John, a distinguished military commander, was a son of Dr Moore, the subject of the preceding article, and born at Glasgow on the 13th of November, 1761. Being destined for the military profession, he was educated chiefly on the continent; and whilst his father was abroad with the duke of Hamilton, the interest of that nobleman procured him admission to the service, in the capacity of ensign to the 51st regiment of foot. It was at Minorca, in 1776, that Moore first entered the army; a lieutenancy in the 82d regiment was the next step of his promotion, and he seems to have held this station, during the several campaigns of the American war, in which he served till the arrival of peace, when his regiment was reduced in 1783.

A seat in parliament, as member for Lanark and the adjoining burghs, obtained apparently by the influence of the patron above referred to, did not long interrupt his advancement. About the year 1788, the office of major in the 4th battalion of the 60th regiment of foot was exchanged for a similar post in his original regiment, the 51st, and followed by the commission of lieutenant colonel, which he purchased in that corps two years afterwards. From Gibraltar, where his military duties had placed him, he was ordered to Corsica in 1794; and the esteem of General Charles Stuart, formed an epoch in his military life. The siege of Calvi was the scene of this distinction; and his first wound was received in storming the Mozzello fort.

When a disagreement with the Viceroy had produced the recall of general Stuart, Moore succeeded him in the character of adjutant-general; but as the subject of dispute with the viceroy still subsisted, the new commander remained not long in good terms with him. His return to Britain, in the year 1795, seems not to have proceeded from dissatisfaction on the part of government; and his appointment to the rank of brigadier-general in the West Indies, which followed immediately, opened a new and more conspicuous field to his military talents. At Barbadoes, in consequence of his appointment, he met Sir Ralph Abercrombie, commander of the expedition destined to act against St Lucie; and in this hazardous service, of which an important department was assigned to general Moore, he acquitted himself with that steadiness and gallantry which excited the warm applause of his superior officer. The conqueror of St Lucie, who had already designated general Moore as "the admiration of the whole army," committed to him the prosecution of his enterprise, together with the government of the island; and this charge, undertaken with reluctance, and rendered full of danger and labour from the hostility of the natives and the number of Maroon negroes, who constantly infested the country, was managed with a decision and activity that overcame every obstacle. Two successive attacks of the yellow fever soon forced general Moore to leave the West Indies, but, in company with Sir Ralph Abercrombie, he was destined to earn still higher distinction. The first scene in which they again acted together, was the Irish rebellion; and during those unhappy contests, notwithstanding the disorganized state of the army, general Moore's conduct was such as to obtain universal approbation.

After Sir Ralph's expedition to Holland, (1799,) in which general Moore was severely wounded, a wider and more brilliant theatre was soon afterwards presented for their united exertions in the expedition to Egypt. During this celebrated campaign, general Moore fully supported the reputation for bravery and coolness which his former services had acquired. An important charge in disembarking the troops was assigned to him; and the battalion which he led was among the foremost in the far-famed enterprise of storming the French batteries, erected on a neighbouring eminence of sand to oppose their landing. His subsequent efforts ably seconded the commander's arrangements, and contributed materially to the happy issue of their undertaking. That victory which was purchased with the life of Sir Ralph Abercrombie, disabled general Moore for a time from farther exertion; a dangerous wound in his leg confined him first on board one of the transports, and afterwards in the neighbourhood of Rosetta, till the conclusion of the expedition. His merits were rewarded on his return to Britain by the order of knighthood; and public opinion seemed to point him out as a fit person for conducting any military operation in which the country might require his services.

After a few years of repose, general Moore (1808) was called to take upon him the command of an armament which the British government had prepared in aid of the Spanish patriots, now engaged in hostilities with Napoleon. It would take up too much room in this place to relate the particulars of this expedition. It is enough to observe, that after an advance to Salamanca, in which he was chagrined by every species of disappointment, cramped by restrictions, perplexed by misinformation, and after a fruitless attempt to penetrate into Portugal, general Moore commenced a retreat to the coast, conducted it successfully in the face of an enemy greatly superior, and by his masterly dispositions at Corunna, repelled the formidable attack, in which a cannon-ball deprived him of life,—though not till his last moments were consoled by intelligence that victory had secured a safe embarkation for his troops. He died with the equanimity which became him, on the 16th of Jan., 1809. His death excited a great sensation throughout the country. The house of commons ordered a monument to be erected for him in St Paul's cathedral, and his native city, Glasgow, also erected one to his memory. The extent of his merits as a military commander, has been a subject of much controversy, but all, except those blinded by party zeal, allow, that in proportion to the means intrusted to him, they were very great.

MOORISH ARCHITECTURE. See *Architecture.*

MOORS; a class of the inhabitants of Western Africa, particularly of the states of Fez and Morocco. The Arabians call them *medainien* (mariners); they call themselves *Moslem* (the faithful), and are strict Mohammedans. They are of Arabian origin; they live in towns, and are employed principally in traffic. The Romans called a part of Western Africa *Mauritania*, and the inhabitants *Moors*. Their wars with the Romans are well known. This territory was afterwards under the dominion of the Vandals, whose king Genseric (429) established a powerful kingdom, which was, however, overthrown (534) by Belisarius. The Saracens (Arabians), followers of Mohammed, extended their conquests in the seventh century to this part of Africa, which was governed by a deputy of the caliph of Damascus. Subsequently (711—13) they took advantage of the disorders in the Spanish kingdom of the Visigoths to reduce that country, with the exception of a small part, under their yoke. The Spanish writers gave them the name of *Moors* from their residence in Mauritania. While the greatest part of Europe was sunk in barbarism, learning and the arts flourished among the Arabians in Spain, where remarkable monuments of their labours are still seen; but the division of the country among different rulers, and their dissensions, so weakened the power of the Moors, that they could no longer resist the incessant encroachments of the princes of the newly established Christian states in Spain, and were finally reduced to the possession of the kingdom of Grenada. Ferdinand the Catholic, after a ten years' war (1491), conquered this also, and thereby put an end to the dominion of the Moors in Spain, after it had lasted nearly 800 years. A part of the Moors went to Africa; most of them remained in Spain, where they were industrious, peaceful subjects, and adopted generally the external forms of Christianity. These last were called, in Spain, *Moriscos*. Philip II., in his ferocious zeal for Christianity, resolved upon their entire destruction. His oppressions and persecutions excited an insurrection of the Moriscos in Grenada (1571), after the suppression of which, above 100,000 of them were banished. Philip III., in the same spirit of fanaticism, completed their expulsion from the country. Nearly a million of the Moriscos emigrated to Africa. As they were the most ingenious and industrious inhabitants of Spain, they were a great loss to the country. Agriculture speedily fell into decay. This expulsion of the Moriscos is regarded as one of the leading causes of the decline of Spain. The History of the Reign of the Moors in Spain, by doctor Jos. Ant. Conde, is drawn from Arabian manuscripts.

MOOSE. See *Deer.*

MORA; a game known even among the ancients, and at present much in vogue in the south of Europe. It is played by two persons. Both present, at the same time, one hand, of which some fingers are extended, or all, or none. At the same moment each of the parties calls out a number. If the number pronounced by one of the players agrees with the number of the fingers stretched out by both, he who pronounced it counts one, and lifts one finger of the unemployed hand. He who first succeeds in opening all the fingers of this hand, wins the game. It is generally played to determine who is to pay for the wine, and the like. A person unacquainted with the game finds it difficult to conceive how it can be interesting; yet you see it played with the greatest animation everywhere in Italy.

MORALES, Louis de, commonly called *el Divino*, from his having painted nothing but sacred subjects, was born at Badajoz, in 1509. His pencil is bold, his touch vigorous, yet delicate, and his pictures all have life and action. They are generally of a small size, and commonly on copper. He painted hair with peculiar excellence. Morales visited all the cities of

Spain which contained any *chef d'œuvre*, and, by this indiscriminate study of different masters, acquired remarkable originality of manner. He died at Badajoz, in 1586. His works are scattered through Spain. The picture of St Veronica, in the church of the barefooted Trinitarians, at Madrid, is his master-piece.

MORALITY; a sort of allegorical play, so termed because it consisted of moral discourses in praise of virtue and condemnation of vice. It succeeded the Mysteries. The dialogues were carried on by such characters as Good Doctrine, Charity, Faith, Prudence, Discretion, Death, &c., whose discourses were of a serious cast; while the province of making merriment for the spectators descended from the Devil in the Mystery to the Vice or Iniquity of the Morality, who usually personified some bad quality, and whose successor we find in the clown or fool of the regular English drama. (See *France*, *Literature of*, division *Drama*.) Moralities were occasionally exhibited as late as the reign of Henry VIII., and, after various modifications, assumed the form of the Mask, which became a favourite entertainment at the court of Elizabeth and her successor. See *Drama*.

MORAL PHILOSOPHY is the science which treats of the motives and rules of human actions, and of the ends to which they ought to be directed. The moral law is the law which governs intelligent and free beings, and which determines the character of vice and virtue. It is a natural law, independent of any human institution; a religious law, which emanates from the supreme Legislator, obligatory in itself, through the conviction which it produces, universal and immutable. The moral law revealed itself in the infancy of society. Philosophers are its expounders, not its creators. Their voice is but the echo of conscience. The first moralists confined themselves to expressing the law of duty in maxims, or to illustrating it in apologues. It needed no proof beyond a mere enunciation. Their simple precepts have been honoured in all ages. Three chief causes have concurred in developing and establishing the rules of practical morality,—positive laws, religious institutions, and civilization. Positive laws are only the written expression of the law of duty engraved in the human soul, with such provisions as the violence of the human passions requires to enforce its precepts. Legislators, it is true, have had in view rather the general interests of society than the interest of morality in the abstract; their punishments are proportioned to effects rather than intentions. But the common good is usually found to accord with individual duty; and men require, in the provisions for the public weal, an acknowledgment of the moral law. They require to be addressed in the name of justice.

While civil institutions have regulated the conduct of man in society, religious institutions have penetrated into the sanctuary of conscience. Moral and religious sentiments are developed almost spontaneously, and have a natural sympathy. From its alliance with morality, religion becomes refined and elevated. Christianity has blended them in the precepts of love to God and love to man.

What we call *civilization*, is a complex result which supposes the existence of close, extended, and varied relations among men, the development of industry, the progress of intelligence and taste, the establishment of general order, the refinement of public and private manners. It is, in part, the fruit of civil and religious institutions. Practical morality exerts a powerful influence on it, strengthening the ties which unite individuals, fortifying the respect for equity and benevolence, encouraging labour, and assuring its reward by protecting property, favouring the progress of intelligence by nourishing the love of truth, and improving taste by purifying and elevating the sentiment of the beautiful. Civilization, in its turn, promotes practical morality. The closer and more varied the relations among men become, the more sensible do they grow to their mutual duties. Labour gives man the sentiment of self-respect; the progress of science and the arts aids virtue, by enlightening the mind, and accustoming it to noble and delicate pleasures. If such are the influences of laws, religion, and civilization upon morality, we need not be surprised that they have, in turn, been considered its source, from a limited view of its nature. But if the moral law is, in reality, prior to all these, why, it may be asked, does it appear to vary so much in its effects in different places and ages? To this we reply, that practical morality supposes two conditions—the idea of duty faithfully comprehended, and the authority of duty strongly felt. But the idea may be partially or erroneously understood, and the sentiment may be blunted or weakened. The law of duty, in the abstract, is simple, and not liable to be mistaken; but its applications are often complex and delicate, requiring the exercise of a strong and cultivated reason, and therefore affording great occasion for mistake. The feeling of duty, too, requires a certain degree of reflection, and becomes extinct in a life of violence and sensual excess. It may, moreover, become perverted in consequence of positive ordinances, civil and religious. But the very abuse of the notion of duty supposes its existence; and we find not a few instances in which the native energy of the moral feeling has risen superior to positive institutions, and wrought fundamental changes in the laws, religious and other institutions, which had sought to enchain it. We might add, that the doctrines of philosophy have often been much more the effect of the manners of a particular country or age than the agents which modified them.

Moral precepts may be distinguished into two orders, with reference to the degree of obligation which they impose—the imperative and the meritorious. The first commands us to render to every man his due, including, of course, our duties to ourselves; the second, to do for every man, ourselves included, all which is in our power, and therefore to strive for our own highest improvement. But the limits of these two classes cannot be distinctly defined. In considering what the moral law enjoins, we soon perceive that there are degrees in our duties. Just as actions may differ in criminality, so may they also differ in merit; and the degree in both cases will depend upon accompanying circumstances; and circumstances are often such as to make it difficult to determine on which side the balance of duty predominates. But though man is often driven to choose between conflicting duties, he is never obliged to choose between two criminal acts; although, in some cases an act of guilt will present itself under the specious guise of a means for a good end; which has led some speculators to the revolting doctrine, that the end justifies the means—a doctrine sufficient to excuse the wildest excesses of fanaticism, which, in its blind zeal to effect what it deems a laudable object, tramples under foot the most sacred rights. When we inquire what gives a moral character to actions, we learn that it is the intention. A man's acts may, however, be sinful, although his intention at the time may not have been bad, if they originated in prejudice or ignorance, occasioned by a sinful neglect of the means of information. Proper instruction in moral duties is therefore every man's highest interest and highest duty.

Moral duties have been distinguished into three great classes—duties to God, to our fellow-men, and to ourselves—but, though they may be classified, they are not to be separated. Duties to God comprise, essentially, all our obligations; and when we serve other men, we, in fact, labour for ourselves; so, too, in improving ourselves, we are qualifying ourselves to render the highest service to others. The class of mutual duties which supports the social relations may be divided into three branches—the duties of the individual to society, those of society to the individual, and those of societies to each other. Under the name of *societies*, we include all the forms and degrees of human association—the family, city, country, and mankind. The duties of the individual towards society differ with the station which he occupies, and the nature of social institutions. The duties of the private man, the magistrate, and the statesman, are very various. Free institutions, as they greatly increase the sphere of efficiency, proportionably enlarge that of duty; and the rapid growth of such institutions, in our day, must give rise to new classes of social duties. Perhaps a wide field still remains open to moralists, in the exposition of the duties which society owes to its members. Some philosophers have been so blind to these as to maintain that the public interest would justify the sacrifice of an innocent individual. And how long have mankind been in learning the respect which they owe to the individual liberty of thinking, speaking, and writing? Is this respect properly understood, even at present? Have politicians duly learned the regard which they owe to the moral law? Is it a long period since the writers on general law have considered with proper attention the rules which society ought to impose on itself in the application of punishments? But it is the relations of societies towards each other which principally demand the meditations of moralists. There is a social selfishness which meets a ready excuse, since each member of a society is apt to consider his individual character merged in his social, and that his duties towards the association with which he is connected, justify acts and feelings which would be censurable in his commerce with others in his individual capacity. Hence that *esprit de corps*, so bitter in its animosities, and so unscrupulous in its ambition, arming nation against nation, from commercial rivalry or lust of territorial aggrandizement, from wounded pride or thirst of conquest. The code of international law is yet very imperfect, and needs to be completed by reference to the code of morality.—See Paley's *Principles of Moral and Political Philosophy*; Adam Smith's *Theory of Moral Sentiments*; Dugald Stewart's *Philosophy of the active and moral Powers of Man*; Degerando's *Perfectionnement Moral*; Mackintosh's *History of the Progress of Ethical and Political Science* (London, 1830.)

We shall now say a few words on the different theories of moral sentiments. Philosophers have endeavoured to establish some general principle from which the laws of practical morality may be derived, and to which, in doubtful points, we may refer, to determine our rule of conduct in particular cases. The Hindoo moralists find their moral principle in the precept to purify the soul from all sensual desires. Plato, who drew from Eastern fountains, expresses his law of morality under three different forms—Strive to resemble the Deity. Let your passions be in harmony with each other. Live in accordance with the fundamental type of the soul, or inborn ideas (or, according to the Stoics, with nature). Aristotle considered virtue and prudence as the same, and recommended the golden mean, or a rational avoidance of extremes; virtue, according to him, consists in the habit of mediocrity according to right reason. Epicurus (who did not, however, understand his precept in the low sense usually ascribed to it) founded his moral system on the rule, Live to enjoy thyself; which has been considered to refer to the happiness which virtue gives; and it is certain that Epicurus himself was a model of virtue. The new Platonists followed their master on this point. The fathers of the church did not attempt to establish any universal moral principle; nor did the Scholastics. The British moralists have founded their systems on different principles; Hutcheson's rests upon the principle of benevolence, and assumes a moral sense; Ferguson followed the Epicurean theory; Samuel Clarke places virtue in acting according to the nature of things, by which man will facilitate his progress to his destined sphere. Adam Smith assumes sympathy as the moral principle; Wollaston, the acting according to the truth of things; lord Shaftesbury, the maintenance of a proper balance of the affections. Paley's system is founded on utility. Cudworth considers virtue as an innate principle. Of the continental moralists, Grotius and Puffendorf derive all duties from the fundamental obligation to improve the condition of others and of one's self, and therefore command us to endeavour to do all in our power to promote the general good. The precept of Crusius, who considers duty an obligation to God rather than to man, is, Obey all the precepts of God. Thomasius, Leibnitz, and Wolf give, as their fundamental principle, Aim at perfection; Kant, Be thy own lawgiver, and strive less for dominion over others than over thyself. In all theories of morals, two questions arise—What is virtue? How is it recommended to us? And all theories on each point may finally be reduced to three; on the first, that virtue is benevolence, or prudence, or propriety; and on the second, that it is recommended to us by self-love, or reason, or a moral sense.

MORAT (*Murten*; Latin, *Muratum*); a town in the Swiss canton of Friburg, on the lake of Morat (Murtensee), fourteen miles west of Berne. It derives its celebrity from the battle fought here between the soldiers of the Swiss confederacy and Charles the Bold, duke of Burgundy, in 1476. After the loss of the battle of Granson (March 3), the fiery duke collected a new army of 40,000 men, and presented himself (June 10) before the gates of Morat. To the aid of the Swiss came their allies, the Rhenish cities, and René, the young duke of Lorraine, who had been driven from his estates by Charles, was with them, but not, as some have said, in the command. Their forces were much inferior to those of the duke; but, having reconnoitred the position of the enemy, they attacked him, drove in the out-posts, entered the camp with the fugitives, and, being joined by the garrison of Morat, gained a complete victory, making themselves masters of the hostile camp, artillery, and baggage. Charles himself escaped merely by the speed of his horse, and accompanied by only twelve horsemen, fled to Soigne, a town of Champagne, seventy miles from Morat. The remains of the killed (15,000) were thrown into a large pit, and covered with lime and earth. A large building was afterwards erected, in which they were collected, and which bore the inscription, *D. O. M. Caroli inclyti et fortissimi Burgundiæ Ducis Exercitus, Muratum obsidens ab Helvetiis cæsus hoc Sui Monumentum reliquit. Anno* 1476. And beneath were these words:—

Dies Gebein ist der Burgundischen Schar,
Im vierzehnhundert siebzig und sechsten Jahr,
Vor Murten durch ein Eidgenossschaft
Erlegt mit Beistand Gottes Kraft.
Auf der zehntausend Rittern Tag
Geschah dies grosse Niederlag.

This monument was destroyed by the French army in 1798, and a lime-tree, surrounded with a fence, planted in its place. In 1822, the Swiss confederacy erected an obelisk on the spot, as a national memorial of the battle.

MORAVIA (in German, *Mähren*); a margraviate and province of the Austrian empire. The margraviate (8862 square miles) borders on the Prussian county of Glatz and Austrian Silesia to the north, on Hungary to the east, on Lower Austria to the south, and on Bohemia to the west. The province includes also Austrian Silesia (1850 square miles), and contains a population of 1,990,464 inhabitants, of whom about 430,000 are Germans, 30,000 Jews, 900 Bohemians, and the rest Sclavonians. It is watered by many rivers, of which only the Marsch or March is navigable for a short distance: on the north, east, and west, it is enclosed by mountains, which are to be considered as continuations of the Sudetic and Carpathian chains, and is open only to the south. To the north, on the borders of Glatz, lies the Schneegebirge, the highest summit of which is the Schneeberg, about 4500 feet high. In general, the loftiest mountains are in the northern part, from which the elevation gradually diminishes towards the south. There are also ridges of hills in the interior, interspersed with fine plains and valleys. The mountainous districts are not fertile; but in the Hanna (land of the Hannaks) and in the southern part, the soil is uncommonly rich. The breeding of cattle, although favoured by rich meadows and pastures, is less attended to than tillage. Great numbers of poultry, particularly geese, are raised. The fisheries are productive. The principal corn districts are in the Hanna, on the March, about Brunn, and in the south-eastern parts of the circle of Znaym. Flax, hemp, fruits, garden vegetables, &c., and in some parts wine, are produced in abundance. Silver and gold were formerly found; iron, sulphur, coal, and alum are the chief mineral products. Woollen and linen manufactures, the latter employing 200,000 spinners and 13,000 weavers, and the former 100,000 workmen and 10,000 looms, and also cotton manufactures, are carried on to a considerable extent. The transit trade of the province, favoured by good roads, is important. The government of Moravia is almost entirely absolute, although it has estates, composed of the prelates, the lords, knights, and royal burgesses. The administration of the affairs of the province is in the hands of a provincial government at Brunn, to which the six Moravian circles (Olmutz, Brunn, Iglau, Znaym, Hradisch and Prerau), and the two Silesian circles (Troppau and Teschen), are subordinate. The (Catholic) bishops of Brunn and Olmutz are at the head of ecclesiastical affairs. The revenue is about 6,000,000 guilders. Brunn is the capital. The Sclavonic population consists of several tribes, which differ in habits and language, and are in a rude state. Among these are the Slowaks (distinguished for wit, eloquence, and taste for the arts and sciences), and the Hannaks (distinguished for hospitality). Previously to the fifteenth century, they professed the Greek religion; the Hussites were then numerous, and, in the sixteenth century, the reformation had many adherents; the Catholics, however, are the most numerous, their number being 1,800,000. This country was anciently the land of the Quadi, and was occupied, after their emigration to Spain, by the Scyri, the Rugii, the Heruli, and, until 548, by the Lombards, when it was entered by a colony of Sclavonians from the Danube, who were driven from their former seats by the Walachians (Bulgarians), and were called *Moravians* from the river *Morava*. After the fall of the kingdom of the Avars, the Moravian Sclavonians extended their limits, and finally founded the kingdom of Great Moravia, which comprehended several other countries beside the present Moravia. Charlemagne subdued the Moravians, and compelled their king Samoslay to be baptized; Cyrillus (856), however, was the true apostle of Moravia. Arnolph at first enlarged the Moravian state, by granting to Swatopulsk, or Zuatoblick, Bohemia and other countries on the one side to the Oder on the other, towards Hungary as far as the Gran. Swatopulsk afterwards revolted; but Arnolph attacked him, with the aid of the Bohemians and Hungarians, and so enfeebled the kingdom, that, under his successor, it was completely overthrown. From that time Moravia became the prey of the Hungarians, Poles, and Germans. In the eleventh century, it was reduced to about its present extent, and formed a part of the Bohemian territories. In 1085, it was made a margraviate, and (until 1611, when it was, for a time, attached to the Hungarian dominions) granted by the Bohemian kings, from time to time, as a fief to their sons or relations. See *Bohemia*.

MORAVIANS, or HERRNHUTERS. See *United Brethren*, and *Bohemian Brethren*.

MORAY, or MURRAY, PROVINCE OF, an ancient territorial district on the east side of the northern division of Scotland, which in modern times comprehends the three several shires of Banff, Moray, or Elgin, and Nairn. It is famed for the fertility of its soil, and the salubrity of its climate, and was at one time reckoned the "granary of Scotland." It gives the title of earl to a branch of the Stuart family.

MORAYSHIRE, or ELGINSHIRE, the central division of the above-mentioned province, is bounded on the north by the Moray Firth, on the east and south-east by Banffshire, on the south and south-west by Inverness-shire, and on the west by Nairnshire and Inverness-shire. It lies between the 57° and 58° of north latitude; and the longitude at the mouth of the Spey is 3° 6′ West, extending in length from east to west 42 miles, and in breadth 20 miles.

The county of Moray is naturally divided into the upper and champaign districts. 1st, The low country is a large plain, bounded by the Firth of Moray on the north, and a winding range of mountains on the south, whose length equals that of the whole county, and its breadth, measured at right angles from the mountains to the shore, is from five to twelve miles, or mean breadth seven miles. The surface of the low lands is diversified by intervening hills, disposed in short ridges parallel to the Firth, and intersected by the rivers Spey, Lossy, and Findhorn, whose streams wind, at unequal distances, across the plain into the sea. Many of the plains along the banks of the Spey and the Findhorn are remarkable for their beauty and fertility. One-third of the bottoms and sides of the valleys within the range of the mountainous or hilly district, except certain parts adapted for bearing trees, is capable of cultivation. The width and depth of these valleys are proportionate to the largeness of the rivers, and the friability of the soil through which they flow. The climate is so mild, that the apricot, nectarine, and peach ripen sufficiently on a wall in the open air, and gardens are formed.

Morayshire contains two royal burghs, Elgin and Forres, and several considerable towns, as Grantown, Garmouth, and Lossie-mouth. The principal noblemen and gentlemen's seats are Gordon Castle and Castle Grant. Population of the county in 1821, 31,162; in 1831, 34,231.

MORBIHAN; a department of France, in the old province of Bretagne, lying on a gulf from which it has received its name. Chief place, Vannes. See *Department*.

MORBUS; a Latin term signifying *disease*, and often used in medicine.

MORDANTS. The colouring substances used in dyeing have been divided by doctor Bancroft into *substantive* and *adjective* colours. *Substantive* colours are those which communicate their tint immediately to the material to be dyed, without the aid of any third substance. *Adjective* colours require the intervention of a third substance, which possesses a joint attraction for the colouring matter and the stuff to be dyed. The substance capable of thus fixing the colour is called a *mordant*, and by Mr Henry, a *basis*.

MORDAUNT, Charles. See *Peterborough, Earl of.*

MORE; the final syllable of a number of Irish geographical names, signifying, in the language of the country, *mountain*.

MORE, Hannah; an eminent moral writer, was born at Stapleton, in Gloucester, in 1744. She was one of the five daughters of a village schoolmaster, whose means were not sufficient to give his children many of the advantages of education; but this deficiency was supplied by their own talents and perseverance. The literary abilities of Hannah early attracted notice, and a subscription was formed for establishing her and her sisters in a school of their own. Her first literary production, The Search after Happiness, a pastoral drama, was written when she was only eighteen years of age, though not published till 1773. By the encouragement of Mr Garrick, she tried her strength in tragic composition, and wrote The Inflexible Captive, a Tragedy, which was printed in 1764. Her tragedy of Percy, the most popular of her dramatic compositions, was brought out in 1778, and ran fourteen nights successively; and her last tragedy, The Fatal Falsehood, was produced in 1779. Shortly after, her opinions on public theatres underwent a change, and, as she has stated in the preface to the third volume of her works, "she did not consider the stage, in its present state, as becoming the appearance or countenance of a Christian." "Early in life she attracted general notice by a brilliant display of literary talent, and was honoured by the intimate acquaintance of Johnson and Burke, of Reynolds and Garrick, and of many other highly eminent individuals, who equally appreciated her amiable qualities, and her superior intellect. But she quitted, in the prime of her days, the bright circles of fashion and literature, and, retiring into the neighbourhood of Bristol, devoted herself to a life of active Christian benevolence, and to the composition of various works, having for their object the religious improvement of mankind. Her first prose publication was Thoughts on the Manners of the Great, printed in 1788; followed in 1791, by her Estimate of the Religion of the Fashionable World. In 1795, she commenced at Bath, in monthly numbers, The Cheap Repository, a series of admirable tales for the common people, one of which is the well-known Shepherd of Salisbury Plain. The success of this seasonable publication was extraordinary; and within a year the sale reached the number of 1,000,000 copies. Her Strictures on the Modern System of Female Education, appeared in 1799; Hints towards Forming the Character of a Young Princess, in 1805; Cœlebs in Search of a Wife, in 1809, (which passed through at least six editions in less than a year;) Practical Piety, in 1811; Christian Morals, in 1812; Essay on the Character and Writings of St Paul, in 1815; and Moral Sketches of the Prevailing Opinions and Manners, Foreign and Domestic, with Reflections on Prayer. The collection of her works comprises 11 volumes 8vo.

Near the beginning of the present century, Mrs More left Bath, and retired to Barley Wood, a cottage delightfully situated in the village of Wrington, the native place of John Locke. In 1819, she lost her last surviving sister Martha, and under this bereavement, and being now confined to her room, she quitted Barley Wood for Clifton, where, and at Bristol, she had some valuable friends, though not a single relation of whom she had any knowledge in the world. She died at Clifton in September, 1833. She is said to have realized upwards of £30,000 by her writings; and her charitable bequests exceeded £10,000.

MORE, Henry, a celebrated divine of the church of England, and Platonic philosopher, was born in 1614. He was the son of a gentleman of good estate, who educated him at Eton, whence he was sent to Christ's college, Cambridge, in 1631. While at the university, he deeply studied the most celebrated systems of philosophy, and finally settled into a decided preference for that of Plato, and for his followers of the school of Alexandria. In 1639, he graduated M. A., and in the following year published his *Psycho-Zoia*, or the First Part of the Song of the Soul, containing a Christiano-Platonical Display of Life. Having been elected a fellow of his college, he became a tutor to several persons of rank. One of these was Sir John Finch, whose sister, lady Conway, an enthusiast of his own stamp, brought him acquainted with the famous Van Helmont, and that singular pretender, Valentine Greatrakes. In 1675, he accepted a prebend in the church of Gloucester, which it is supposed he took only to resign it to his friend doctor Fowler. He also gave up his rectory of Ingolsby, in Lincolnshire, the perpetual advowson of which had been purchased for him by his father, and would never afterwards accept of preferment of any kind, refusing deaneries, bishoprics, and even the mastership of his own college, so desirous was he of unmolested study. During the civil war, although he refused to take the covenant, he was left unmolested. In 1661, he became a fellow of the royal society, and for twenty years after the restoration, his writings are said to have sold better than any other of their day. Doctor More died in September, 1687, aged seventy-three, leaving behind him the character of a man of profound learning and great genius, alloyed by a deep tincture of enthusiasm, chiefly coloured by the supposition that divine knowledge had been communicated to Pythagoras by the Hebrews, and from him to Plato. He was also persuaded that supernatural communications were made to him by God's appointment, by a particular genius, like that of Socrates. The writings of this singular, but amiable man, who was beloved by all parties, have been published in two volumes, folio. The most admired are his *Enchiridion Ethicum*, and Divine Dialogues, concerning the attributes and providence of God. See Ward's *Life of Doctor More*.

MORE, Sir Thomas, a celebrated chancellor of England, was the only son of Sir John More, one of the judges of the court of King's bench, and was born in London, in 1480. He received his early education from a schoolmaster of great reputation in Threadneedle street, and was afterwards placed in the family of cardinal Morton, archbishop of Canterbury, and chancellor, who prophesied his future eminence. In 1497, he went to Canterbury college, now Christ-church, Oxford, and, in 1499, became a student in Lincoln's Inn. At the age of twenty-one, he obtained a seat in parliament, and distinguished himself with so much spirit in opposition to a subsidy, demanded by Henry VII., that the exasperated and avaricious monarch, in revenge, contrived a quarrel with his father, whom he imprisoned until he had exacted an arbitrary fine. After being admitted to the bar, he was appointed law reader of Furnival's Inn, applied assiduously to the practice of law, and enjoyed great reputation as a pleader. In 1516, he accompanied the commissioners sent to renew the alliance between Henry VIII. and Charles, then archduke of Austria, and showed so much ability, that the king was desirous of engaging him in his particular service. In 1518, he published his celebrated political romance of Utopia, which engaged him in a correspondence with Erasmus, with whom he had previously contracted an intimacy while in England; as well as with several other eminent men of letters. Cardinal Wolsey pressed him to receive a pension, which he refused, as inconsistent with his official duties; but after a while he was induced to accept the place of master of requests. He was shortly after knighted, and taken into the privy council; and, the king becoming delighted with his conversation, he was received into the highest degree of familiarity. In 1520, he was appointed treasurer of the exchequer, and, in 1523, at the instance of Wolsey, elected speaker of the house of commons, in which capacity, having done much to frustrate an oppressive subsidy, he highly exasperated the cardinal. If he gave any personal offence to the court by this conduct, it was not of long duration, as, in 1527, he was joined with Wolsey in a mission to France, and on his return was made chancellor of the duchy of Lancaster. In 1530, he succeeded the disgraced cardinal as lord high chancellor, which office he filled three years with scrupulous integrity. Unable to acquiesce in the king's wishes respecting his divorce from Catharine of Arragon, he obtained permission to resign the seals. The affront rankled in the vindictive mind of Henry, which was still further inflamed by his refusal to attend the coronation of Anne Boleyn. An attempt was made to implicate him in the practices of Elizabeth Barton, which altogether failed; and he also perfectly cleared himself of another singular charge, which was that of inducing the king to publish the book against Luther, in which the pope's authority was held forth—a doctrine that was now found inconsistent with the intended attack on the Roman see. At length the oath of supremacy being required by act of parliament, Sir Thomas More was cited before the council to take it; and in spite of all the sophistry of Cranmer and others to induce him to compliance, he nobly persisted in a refusal to act in opposition to the dictates of his conscience, and was consequently committed to the Tower, and indicted for treason. After an imprisonment of twelve months, during which time he resisted all attempts, both public and private, to induce him to retract, he was brought to trial, and, after an eloquent defence, condemned, and sentenced to be hanged and quartered. He received this barbarous sentence with his usual composure, which was disturbed only by the circumstance of a singularly affecting interview with his favourite daughter, Mrs Roper, on his return to the Tower. The king changed the sentence from hanging and quartering to beheading; which act of grace he received with his usual vein of humour, and also acquiesced in the tyrannical mandate, "that he should not use many words at the scaffold." His execution took place July 6, 1535, when he deported himself with a degree of good humour, which, in another sort of man, might be termed levity, but which Addison attributes to the satisfaction arising from conscious integrity, and lord Byron, to a species of temperament too strong even for the control of circumstance, and which conceals a sense of misery without destroying it. Thus died Sir Thomas More, at the age of fifty-five, than whom a character of more disinterestedness and integrity is scarcely to be met with in either ancient or modern history. His learning was various and extensive, his wit abundant, and his elocution ready and agreeable. Except his intolerance towards those whom he considered heretics indeed, the qualities of his mind were most happily blended and tempered. His English works were published collectively by order of queen Mary, in 1557, and his Latin in 1567, at Basle. His Utopia has been translated by bishop Burnet and doctor Warner. See the life of More by Sir James Mackintosh in Lardner's Cabinet Cyclopædia. By his first wife Sir Thomas More had three daughters and one son.—*Margaret*, his eldest and favourite daughter, married William Roper, Esq. of Eltham, in Kent, who wrote the life of his father-in-law, published in 1716. She was mistress of the Greek and Latin languages, and composed with elegance both in English and Latin. Her reverence and affection for her father were unbounded. After his head had been exposed fourteen days on London bridge, she contrived to obtain it, and carefully preserved it; and when she died, it was, at her dying request, buried in her arms.

MOREA (Μωρίας); the modern name of the Peloponnesus (q. v.); a peninsula forming the southern part of Greece, between lat. 36° 23′ and 38° 20′ N., and lon. 21° 5′ and 23° 30′ E. It is connected by the isthmus of Corinth with Continental Greece, or Livadia, from which it is separated in other parts by the gulf of Lepanto or Corinth and the gulf of Athens. To the south-west, it is washed by the Ionian sea, to the east by the archipelago. It is about 160 miles in length and breadth, with a superficial area of 7225 miles. The population of the ancient Peloponnesus has often been estimated at 2,000,000, but it probably never amounted to half that number. Before the late revolution, the Morea contained, according to Soutso, the Greek historian, 460,000 inhabitants, of whom 50,000 were Turks; at present they do not exceed 280,000. The coast is much indented, forming on the south the gulfs of Kolokythia or Laconia, and the gulf of Coron or Messenia, and on the east, the gulf of Argos or Nauplia. The surface of the country is, in general, mountainous; the northern half, however, presents a fruitful plain, intersected, in some parts, by the Cyllenian mountains. The most southern promontory, Maina, is separated from the rest of the peninsula by the different branches of the Taygetus. The rivers are numerous, but not large; the principal are the Alpheus and the Eurotas. The climate is mild, though less so than formerly, on account of the destruction of the forests. The spring and autumn are delightful, but the summer is hot, and the winter is attended with frequent storms and rain; the soil is fruitful, producing corn, wine, oil, and fruits, honey, figs, silk, and cotton. The chief article of export is the small raisins, called *currants*, from the city of Corinth. The long oppression of the Turks discouraged the progress of the mechanical arts, and the devastations of the Greek revolution swept away almost every establishment for manufactures. Excellent ports, such as Navarino and Napoli di Romania, will facilitate the commerce of the country. The population is at present almost entirely composed of Greeks; they are vigorous, well made, active, and intelligent, but cunning, artful, inconstant, and superstitious. Under the Turkish dominion, the Morea was divided into two sangiacks, that of Morea or Tripolitza, and that of Mistra or Misitra. Since the liberation of Greece, it has been divided into seven provinces, in which, as also in respect to other places, the Greeks have attempted to revive the ancient names. They are Argolis, Achaia, Elis, Arcadia, Upper Messenia, Lower Messenia, and Laconia. Formerly adorned with a hundred cities, it now hardly contains any thing that deserves the name. Tripolitza, Coron, Modon, Misitra, Calamata, Arcadia, Napoli di Romania, Monembasia, Argo, and Patras, are the principal. Among the ruins of the ancient cities, those of Sparta, Mycenæ, and Mantinea are the most interesting. The ancient history of the peninsula is given in the article *Peloponnesus;* the modern history, in the article *Greece, Revolution of.* On the division of the Roman empire, Greece formed a part of the Eastern empire, and the Morea was taken possession of by the Venetians, at the time of the decline of that empire. In the middle of the fifteenth century, the Turks wrested almost the whole of the peninsula from the Venetian republic. Towards the end of the seventeenth century, it was again recovered by Venice, and ceded to it by the peace of Carlowitz, in 1699. It was restored to Turkey in 1715. In 1770, Russia excited an insurrection among the Moreots, which was suppressed, and followed by the execution of a great number of the insurgents. Besides the works referred to, in the article on the revolution of Greece, particularly Pouqueville's and Anderson's works, the reader may consult Trant's *Greece*, in 1830, and Leake's *Travels in the Morea* (3 vols., 8vo, 1830).

MOREAU, Jean Michel, the younger, born at Paris, 1741, a scholar of Lelorrain, accompanied the latter to St Petersburg, when he was chosen director of the academy of arts in that city. Moreau went with him as assistant, though he was then but seventeen. Two years after this, Lelorrain died, and Moreau returned to Paris. Being entirely without means, he abandoned painting, and, under Lebas, devoted himself to the study of engraving; and, as he drew with skill, he prepared the designs for his plates himself. Moreau quickly established his fame. He prepared engravings for the works of Homer, Thucydides, Marcus Aurelius, Virgil, Juvenal, Ovid, Corneille, Racine, Lafontaine, Regnard, Crébillon, Rousseau, Montesquieu, Marmontel, Raynal, Mably, Gresset, Barthélemy, Saint-Pierre, Voltaire, and Molière, to each of the two latter two different series of engravings (making, together, more than 100 plates); also sixty plates for Gessner's writings, eighty for the New Testament, and 160 for the History of France. The great variety of these subjects prove his extensive information; and Moreau might be considered as a living encyclopaedia of arts. In 1770, he was commissioned to prepare all the drawings required for the public festivities, and those of the court; and he commenced his duties with the sketches for the celebration of the nuptials of the dauphin and the other royal princes. In 1775, he published engravings, executed by himself, of his drawings for the coronation of Louis XVI., and was made member of the academy of painting, and draughtsman of the royal cabinet. His activity is shown by the number of his productions; for, besides what he completed as royal draughtsman, the number of drawings which he executed for engravings amounts to 2400. In 1784, he made a visit to Italy, which forms an epoch in his opinions and productions. All his works, after that period, are freer and nobler. As late as 1810, he enriched the exhibition of works of art with two drawings, each of which contained more than 300 figures. His disinterestedness prevented him from accumulating property. He died at Paris, 1814.

MOREAU, Jean Victor, one of the oldest and most celebrated generals of the French republic, was born at Morlaix, in Bretagne, in 1763. His father destined him for the law; but, led by his decided predilection for the military profession, he fled from his studies, and enlisted in a regiment, before he had attained his eighteenth year. He was not, however, suffered to indulge his ruling passion, but was obliged to apply himself anew to the study of law at Rennes, of which school he became provost. When the revolution broke out, he had acquired considerable reputation; and, in 1789, a general confederacy of the Bretons being formed at Poictiers, he was chosen its president, and also became commander of the first battalion of volunteers, raised in the department of Morbihan, at the head of which he joined the army of the north. He subsequently favoured the party of the Gironde, the fall of which much affected him; and it was with great repugnance that he accepted the constitution of 1793, when formally presented to the army. In the mean time, he much distinguished himself at the head of his battalion; and Pichegru, under whom he served, did all he could to befriend him. The same year, he was made general of brigade, and, in 1794, general of division, and was intrusted with a separate force, to act in maritime Flanders, where he took many towns. He also had a share in the memorable winter campaign of 1794, in which he commanded the right wing of Pichegru's army. He was soon after named commander-in-chief of the army of the Rhine, and commenced that course of arduous operations which terminated in the celebrated retreat, from the extremity of Germany to the French frontier, in the face of a superior army, by which his skill as a consummate tactician was so much exalted. Meantime, the republic was torn with intestine divisions, and a conspiracy was entered into by Pichegru, which it was the fortune of Moreau to discover, by a correspondence which accidentally fell into his possession. After struggling, for some time, with his friendship for his old commander, he finally gave up these documents to the directory; but the evident reluctance with which he took this step, excited suspicions at Paris, and, finding that he could not explain himself satisfactorily, he begged leave to retire, which was granted. His talents as a general again brought him forward, and, in 1798, he was sent to command the army of Italy, where, after some brilliant successes, he was obliged to give way to the Russian force under Suwarrow, and he managed another retreat with great skill. On quitting the command in Italy for that on the Rhine, he visited Paris, where he received some propositions to strengthen the party of the declining directory, to which he would not accede. On the return of Bonaparte from Egypt, he at first cordially supported him; but a coldness and jealousy ensued; notwithstanding which the latter, as first consul, intrusted him with the command of the armies of the Danube and the Rhine. The passage of these rivers, with the battles of Moskirch, Engen, Memmingen, Biberach, Hochstadt, Nordlingen, and others, followed, ending with the decisive victory of Hohenlinden, which induced the Austrians to ask for peace. On his return to Paris, he was received by the first consul with the most flattering attention; and he soon after contracted an alliance with a young lady of birth and fortune, whose ambition, with that of her connexions, is supposed to have fomented the discontent which soon after induced him to retire to his estate at Groisbois. He was finally accused of participation in the conspiracy of Pichegru and Georges, was brought to trial, with fifty-four other persons, declared guilty upon slight evidence, and sentenced to two years' imprisonment, and to bear the expenses of the suit. He was, however, allowed to travel, in lieu of imprisonment, and to seek an asylum in the United States of America, on condition that he would not return to France without permission from the government. He accordingly embarked at Cadiz, in 1805, and safely reached America, where he bought a fine estate, near Morrisville, on the Delaware. Here he remained some years in peace, until, listening to the invitation of the allies, and more especially of Russia, he embarked for Europe in the July of that year, and reaching Gottenburg, proceeded to Prague. Here he found the emperors of Austria and Russia, with the king of Prussia, all of whom received him with great cordiality; and he was induced to aid in the direction of the allied armies against his own country. It was a fatal resolution to himself; for, on the 27th of August, soon after his arrival, while conversing with the emperor Alexander on horseback, in the battle before Dresden, a cannon ball fractured his right knee and leg, and carried away the calf of the the left, so as to render the amputation of both necessary. After languishing five days, he expired, Sept. 1, 1813. He was buried at St Petersburg, and the emperor of Russia made an ample provision for his widow, who also received the title of *maréchale* from Louis XVIII. The manners of Moreau were simple, and he was humane and generous, as well as brave. His great merits, as a soldier, all parties admit; but much of his personal conduct as a partisan, and especially that which led to the termination of his life, will be judged of variously by persons of different political opinions.

MORELL, Thomas; an eminent writer on philology and criticism, in the last century. He was a native of Eton, and received his education in the college there, as a scholar on the foundation. He removed to King's college, Cambridge, of which he was chosen a fellow, and, in 1743, took the degree of D. D., and entered into holy orders. His death took place in 1784, at the age of eighty. Doctor Morell republished, with improvements, King's edition of four of the tragedies of Euripides (1748, 2 vols., 8vo), and published an edition of the *Prometheus Vinctus* of Æschylus (4to); a Lexicon of Greek Prosody (4to); and a translation of the Epistles of Seneca, with notes (2 vols., 4to); selected the words for some of Handel's oratorios, and assisted in a modernized version of the Canterbury Tales of Chaucer.

MORELLET, Andrew; abbé, and member of the French academy, born at Lyons, March 7, 1727, and educated in the seminary of the Thirty-Three. His industry, regularity, and good conduct, obtained him admission into the institute of the Sorbonne, where he passed five years entirely devoted to study. He then accompanied a young nobleman to the college of Du Plessis, and afterwards on a tour to Italy, in the capacity of tutor. While at Rome, in 1758, he made an abstract of Eymeric's *Directorium Inquisitorum*, which was published four years later, under the title of *Manuel des Inquisiteurs*. On his return to Paris (1759), Morellet was admitted into the distinguished circle of Mad. Geoffrin; and, having published a satirical piece, in answer to Palissot's tragedy of the Philosopher, entitled *Préface des Philosophes*, in which he made an offensive allusion to the princess de Robecq, he was confined in the Bastile. In 1766, he published a translation of Beccaria on Crimes and Punishments, and, in 1769, issued a *Prospectus d'un nouveau Dictionnaire de Commerce*, on which he was employed twenty years, and which was suspended by the revolution. In 1772, he visited England, where he became acquainted with Franklin and other distinguished individuals; and, in 1783, his services were required in the negotiations for peace, between England and France, and were rewarded by a pension of 4000 livres. On the outbreak of the revolution, he published several pamphlets on political subjects, opposed the abolition of the academy, though without success, but succeeded in saving its archives from destruction. His *Cri des Familles*, in defence of the rights of the children of those who perished in the time of terror, and his *Cause des Peres*, in favour of the emigrants, while they hazarded his safety, gained the esteem of the good. The loss of his pension, at this time, obliged him to undertake the translation of several works, novels, travels, &c., from the English. On the establishment of the institute, he was passed over, but, in 1803, was admitted into the *académie*. A fall, which broke his leg, in 1815, at the age of eighty-eight, did not diminish his literary activity, and his last years were occupied with the *Mélanges de Littérature et de Philosophie du dix-huitième Siècle* (4 vols., 1818). He died in 1819. See the *Mémoires inédits de l'Abbé Morellet*, by Lemontey (Paris, 1823, 2 vols.).

MORELLI, Giacomo, the celebrated librarian of St Mark's, was born at Venice, in 1745, of poor parents, and received an imperfect education, the defects of which he endeavoured to supply by his personal exertions. His frequent visits to the Zenian library, and the nature of his studies, attracted the notice of the librarian Rubeis, who was so much pleased with his zeal and intelligence as to aid him in his pursuits. He visited the other libraries in the city and neighbourhood, copying, making extracts, taking notes, and compiling catalogues. He acquired a knowledge of Greek, and afterwards of French, and soon became known for his learning and industry. His *Bibliotheca manoscritta del Bali T. G. Farsetti* (1771—80), and his *Dissertazione storica intorno alla pubblica Libreria di S. Morco* (1774), and his *Codd. Mss. Lat. Bib. Nanianæ relati cum Opusculis ineditis ex iisdem depromptis* (1776), had already made him favourably known abroad, when, in 1778, he succeeded Zanetti as librarian of St Mark's. During forty-one years, he lived only for this library, which he increased by several valuable collections, obtained from his friends, and from public offices, and to the stores of which he gave new value by his arrangement of them. It is impossible to paint his grief when he was obliged to surrender some of the books to the French; and when the order for removing the library to the ducal palace was communicated to him, he burst into tears, and fainted away. Morelli compiled a catalogue of the Pinellian library, which he had himself arranged, in 6 vols. 8vo. His editions of Aristides against Leptine, Libanius's Defence of Socrates, Aristoxenos's *Rhythmica Elementa*, and his *Epistolæ septem variæ Eruditionis* (1819), and particularly his *Bibliotheca Manuscripta*, with numerous other works of a critical, bibliographical, and antiquarian nature, are monuments of profound learning, acute criticism, and unwearied industry. His *Operette* appeared at Venice, in 3 vols. (1820). He died in 1819.

MORENA, Sierra (*Ariani montes*, or *Marianus mons* of the ancients); a mountainous chain in the Spanish peninsula, which goes off from the Iberian mountains, runs through New Castile, divides Castile from Andalusia, and the latter from Estremadura, and terminates at cape St Vincent, on the western coast of Portugal. The highest summits are not over 3000 feet high. Different parts of it bear the name of *Sierra* (Spanish, *ridge*) *de Cordova*, *Sierra de Guadalcanal*, *Sierra de Caldeiraon*, and *Sierra de Monchique*. It is the scene of several events in Don Quixote. In 1768, during the reign of Charles III., Olavides (q. v.) established a colony, composed principally of foreigners, in the central part of the chain. It contained about 10,000 individuals at the time of his disgrace, but was then neglected, and mostly deserted by the colonists. In 1791, the number was 6200, chiefly Spaniards, who had taken the place of the original colonists. The colony was called *Nuevas Poblaciones de Sierra Morena*; the chief place, *La Carolina*, in honour of the king. The name of the chain (signifying, in Spanish, *black mountain*) is supposed to be derived from the dark appearance of its forests.

MORERI, Louis, a French ecclesiastic and biographical writer, born in Provence, in 1643, was educated among the Jesuits, at Aix, and, entering into holy orders, became almoner to the bishop of Apt. That prelate having formed the plan of a universal historical dictionary, caused researches for materials to be made, in various countries, and particularly in the Vatican library at Rome. Not choosing to let the work appear in his own name, he transferred his collections to Moreri, by whom they were arranged and prepared for the press. He published his *Dictionnaire Historique* at Lyons, in 1674, in one volume, folio; and a second edition, enlarged to two volumes, appeared in 1681. Moreri died in the course of the preceding year. The voluminous compilation to which his labours gave birth, having been variously augmented, by Le Clerc and other writers, extends, in the last edition (published at Paris, in 1759), to 10 vols., folio.

MORESQUES, in painting. See *Grotesques*.

MORETO Y CABANA, Augustin; an eminent Spanish dramatic poet in the reign of Philip IV., of whose life nothing is known, except that he wrote plays, sometimes in connexion with other writers, and sometimes by himself, but afterwards entered a religious house, and renounced poetry. In comedy, many prefer him to Calderon, although they blame the defects of his plots, and his incorrect style. Some of his plays are entirely comic, and distinguished for character, although in the form of the Spanish comedies of intrigue. His comedy *De fuera vendra, quien de Casa nos echara* (with several others, in Huarte's *Teatro Espanol)* contains several characters, drawn with much humour and comic power. His *Grazioso* (the clown or buffoon of the *comedias de capa y espada*) too often utters stale jests. His *El Desden con el Desden*, one of the most popular Spanish comedies, has been imitated in other languages (in French by Moliere, in his *Princesse d' Elide)*. His *No puede ser* was also brought upon the French stage, by Dumaniant, in the *Guerre ouverte*, and imitated, by Molière, in his *Ecole des Maris*. His dramas are found in the *Comedias de Moreto y Cabana* (1676—1681, 3 vols., 4to).

MORGAGNI, Giambattista; one of the most learned physicians and anatomists of Italy, born at Forli, in the States of the Church, in 1682, studied at Bologna, where the celebrated Valsalva was his friend and teacher, and soon became so distinguished in natural philosophy, medicine, and also astronomy, that he was able to assist his master in his lectures. But he devoted himself more particularly to the study of anatomy, and, in his twenty-fourth year, composed some important and valuable essays on anatomical subjects. After passing several years in his native city, as a practising physician, he became (in 1712) professor of medicine in Padua. His fame as an anatomist was extended throughout Europe, and procured him admittance to the principal academies. Among his numerous writings are his *Adversaria Anatomica omnia*. The Leyden edition of 1741 contains also *Nova Institutionum medicarum Idea; Epistolæ anatomicæ; De Sedibus et Causis Morborum*, &c. His complete works were published, before his death, by his pupil Larber (*Morgagni Opera omnia*, 1765). He died in 1771. His name has been given to several parts of the body discovered by him.

MORGAN, William. See *Masonry, Free*.

MORGANA. See *Fata Morgana*

MORGANATIC MARRIAGE (*matrimonium ad morganaticam, matrimonium ad legem Salicam*), from the Gothic word *morgjan* (to shorten, limit), also sometimes called, in Germany, a *left handed marriage*, is one in which it is stipulated that the wife (who is inferior, in birth, to the husband) and her children shall not enjoy the privileges of his rank, nor inherit his possessions. The king of Prussia contracted an alliance of this kind with the present princess of Liegnitz. The common law of Germany permits such marriages only to the high nobility. They are often erroneously regarded as somewhat illegal, which is not the case, though serious objections can be raised against the principle.

MORGARTEN. On the frontiers of the canton of Schweitz, lies lake Ægeri. It is a league in length, very deep, and has numerous fish of every description. On the eastern border of the lake is the mountain of Morgarten, of which the greatest part belongs to the canton of Zug. Here the forest towns, Schweitz, Uri, and Unterwalden, laid the basis of the Swiss confederation, by the victory gained Dec. 6, 1315, over Leopold, archduke of Austria. (See *Switzerland*.) These cantons, united for ten years, declared themselves in favour of the emperor Louis of Bavaria, in consequence of their hatred to Austria. Frederic of Austria, therefore, the rival of Louis, placed them under the ban, and the bishop of Constance excommunicated them. The emperor Louis, and the archbishop of Mentz, however, absolved them from both sentences. Frederic then raised an army of 20,000 men, which, under the command of his brother, Leopold of Austria, advanced against the forest towns, whose power was limited to 1600 brave men. This little body occupied a narrow pass, between mount Morgarten and the lake Ægeri: part of them were stationed on the side of the steep mountain. Leopold's army had hardly penetrated the narrow pass, when the Swiss rolled heavy masses of stone upon them, which threw the cavalry into disorder, wounded and killed many of the enemy, and dispersed them. Leopold escaped. The three cantons now formed a perpetual league, Dec. 8, 1315, at Brunnen. By the year 1513, ten cantons had successively joined the confederacy.

MORGENSTERN. See *Battle-Axe*.

MORGHEN, Raphael, a celebrated engraver, was born at Naples, in 1758. He received his early instructions from his father, and was afterwards placed as a pupil under the celebrated Volpato, whom he assisted in engraving the famous pictures of Raphael, in the galleries of the Vatican. The print which represents the miracle of Bolsena is inscribed with his name. After having married the daughter of Volpato, he was invited to Florence, in 1782, to engrave the masterpieces of the Florentine gallery. Of the works which he produced on this occasion, his copy of Raphael's Madonna della seggiola is considered the most excellent. The reputation which he acquired by his labours on the Florentine gallery, induced the artists of Florence to recommend to the grand-duke to employ him in engraving Leonardo da Vinci's noble composition of the Last Supper, which is painted on the wall of the refectory, in the Dominicans' convent, at Milan. This picture is much dilapidated, and the drawing which was made from it for Morghen was by no means worthy of the original; so that, though the engraver has given to the world an admirable print, he has failed in giving a correct idea of the style and merit of Leonardo. In 1803, he was chosen an associate of the French institute; and, in 1812, he was invited to Paris, by Napoleon, who treated him with the most flattering kindness. Among the most remarkable of the other numerous works of Morghen, may be noticed the Transfiguration, from Raphael; a Magdalen, from Murillo; a head of the Saviour, from Da Vinci; the Car of Aurora, from Guido; the Hours, from Poussin; the Prize of Diana, from Domenichino; the Monument of Clement XIII., from Canova Theseus vanquishing the Minotaur:

portraits of Dante, Petrarca, Ariosto, Tasso, &c. A complete list of his works, to the number of about 200, was published by Palmerini, at Florence, in 1810.

MORGUE, La; a place in Paris, where the bodies of unknown persons, who have perished by accident, murder, or suicide, are exposed, that they may be recognised by their friends. If not claimed after remaining three days, they are buried. The clothes of the deceased are hung by the side of the body, which is placed under a glass case, on a slab of black marble.

MORHOF, Daniel George, a learned philological writer, born at Wismar, in the duchy of Mecklenburg, in 1639, was educated at Stettin and Rostock, where he studied jurisprudence, but, in 1660, was chosen professor of poetry at the latter university. Previously to engaging in the duties of his office, he travelled, for two years, in Holland and Britain. In 1665, he became professor of poetry and rhetoric at Kiel. He visited Britain and Holland a second time in 1670, when he contracted an intimacy with Boyle, and with several of the Dutch literati. In 1673, he obtained the chair of history, at Kiel, and, in 1680, was appointed librarian to the university. He died in 1691, at Pyrmont, whither he had gone for the benefit of his health. He was the author of a valuable work, entitled *Polyhistor Litterarius, Philosophicus, et Practicus*, part of which he published at Lubeck, in 1688, and it was reprinted, with additions, in 1695; but the most complete edition is that of 1747 (2 vols., 4to). Morhof was also the author of a tract *De pura Dictione Latina*, and other works.

MORION; a kind of open helmet, without visor or beaver, somewhat resembling a hat, which was commonly worn by the arquebussiers and musketeers.

MORISCO. See *Moors*.

MORLACHIANS. See *Dalmatia*.

MORLAND, George, an eminent painter of rustic scenery and low life, was born in London, in 1764. He acquired a great degree of skill as a faithful copier of nature, and, in the early part of his career, confined himself to the delineation of picturesque landscape; but, having contracted irregular habits, and a partiality for the bottle and low company, he forsook the woods and fields for the ale-house; and stage-coachmen, postilions, and drovers drinking, became the favourite subjects of his pencil. Some of his best pieces exhibit farm-yards and stables, with dogs, horses, pigs, and cattle; or scenes at the door of the village ale-house designed with all the truth and feeling which communicate a charm to the meanest objects, and proclaim the genius of the artist. Many of his pictures were painted in the midst of embarrassments occasioned by his imprudence, and some of them while under confinement for debts which he had contracted. He fell a victim to intemperance, dying while in confinement, Oct. 29, 1804.

MORNAY, Philip de (sieur du Plessis Morlay), a distinguished French nobleman of the sixteenth century, born in 1549, at Buhi, in Normandy, was educated by his mother in the tenets of the reformed religion. In 1567, he entered the army, and bore his part in the civil wars, which, at that period, distracted France; but, after the massacre of St Bartholomew's, he left his country, and visited Switzerland, Germany, Italy, and a great part of the north of Europe, including England, where Elizabeth received him with distinguished marks of favour, as an able supporter of the Protestant cause. When, in 1576, Henry of Navarre (afterwards Henry IV., of France) openly placed himself at the head of the Huguenot party, De Mornay once more took up arms, and continued in the service of this monarch during the whole struggle against the league; but when, in 1593, Henry reconciled himself to the church of Rome, De Mornay sent in his resignation, and, retiring from court, devoted the remainder of his life to literary pursuits, and to advocating, with his pen, the cause of that religion which he had defended with his sword. His first work—a Treatise on the Church—appeared in 1578, and was followed, the succeeding year, by another, on the Truth of Christianity. His most able, as well as most celebrated work, was a Treatise on the Sacrament of the Lord's Supper (1598), in which he vindicated the Calvinistic doctrine, as opposed to that of transubstantiation; and cardinal Du Perron, two years after its publication, entering into a personal dispute with the author on the subject, in a conference at Fontainebleau, the latter maintained his argument with so much ability, as to acquire, from those of his own persuasion, the appellation of the *Protestant pope*. Seven years afterwards, he printed a history of the papacy, under the title of the Mystery of Iniquity. This estimable man, whose learning, constancy, and unblemished morals, acquired the respect even of his opponents, died in 1623, at his chateau of La Forest, in Poictou, whither he had retired, in 1621, after having been deprived of his government of Saumur, by Louis XIII. His *Mém. et Corresp. pour servir à l'Histoire de la Réformation et des Guerres civiles*, 1571—1623 (most complete edition, Paris, 1825, 15 vols., with a sketch of his life), is a valuable contribution to the history of the time. Voltaire has erected to him a fine monument in the Henriade.

MOROCCO (*Marokos*, or *Marasch*—part of ancient *Mauritania*); a large empire in the north-west part of Africa, bounded N. by the straits of Gibraltar and the Mediterranean, E. by Algiers, S. by Sahara, and W. by the Atlantic; about lon. 1° to 10° W.; lat. 29° to 36° N.; square miles, according to Graberg, 290,000. The limits and divisions are not well ascertained. It is divided into two parts by the great chain of the Atlas, which traverses it first from E. to W., and then from N. to S., leaving between itself and the sea a plain of from 50 to 100 miles in breadth. This plain, which is 400 or 500 miles in length, in an oblique line, includes all the populous and fertile part, comprising Morocco Proper and Fez. The division beyond the Atlas comprises Draha, Tafilet, Sugulmessa, &c. The population is variously estimated; by Graberg, at 5,000,000; by Chenier and Hoest, at 5,000,000 or 6,000,000; and by Jackson, at 14,886,000: population of the cities, according to Jackson, 995,000; of Morocco and Fez, N. and W. of Atlas, 10,300,000; the Brebers, 3,000,000; Tafilet, S. E. of Atlas, 650,000. This statement is said to have been taken from the imperial register, but is probably a great exaggeration. The chief towns are Morocco, the capital, Fez, Mequinez, Mogadore, the principal seaport, Tarudant, Rabat, Sallee, Tangiers, Saffet, and Tetuan. The government is a most barbarous despotism, under a chief, styled the sultan of Fez and Morocco, who is absolute master of the lives and fortunes of his subjects. In many parts of the country, his power is very precarious, and his superiority is acknowledged by many tribes merely by the payment of tribute. The religion is Mohammedan. The population consists of Moors, who live in the towns, and carry on trade; Arabs, who dwell in the country, in villages; Brebers, the oldest inhabitants of the land (see *Barbary States*); Negroes, who live in a state of freedom, dispersed over the country; Jews, in a great measure the descendants of those who were driven from Spain, by Ferdinand the Catholic; they are numerous, but despised and oppressed; renegado Jews and Christians, principally Spaniards; Christians, who are merchants, artisans, and slaves. The grand physical characteristic of the country is the great chain of the Atlas, the summits of which are covered with perpetual snow. The country between this chain and the ocean is watered by numerous streams from the mountains; is exuberantly fertile, producing grain, almonds, dates, and various other fruits. Silk and wool are plentiful. The leather called *morocco* (q. v.) is manufactured from the skins of the goats of Tafilet. Morocco has mines of iron, tin, copper in abundance, antimony (more carefully worked than the others), and mineral salt in great plenty. (See *Barbary States*.) The early history is given in the article *Moors*. In 1557, Mehemed, a sherif, or one who claimed to be descended from the prophet, obtained possession of the throne of the empire, which is still occupied by his descendants. Frequent and bloody civil wars have been carried on by the royal princes, who have been, for the most part, distinguished only for their cruel despotism. The most ferocious of these tyrants was Muley Ismael, who died, after a long reign, in 1727 He was succeeded by his son Muley Abdallah, who ascended the throne after a long struggle with his brothers. That prince was followed in the government by his son Muley Sidi Mohammed (1757), who carried on war against France, Spain, and Portugal, but concluded treaties of peace with the other powers. On his death, in 1790, a war broke out between his sons, on the subject of the succession. Muley Soliman finally obtained possession of the throne, and, on the invasion of Egypt by the French, sent a contingent to the Turkish army. A treaty with the United States, which had been concluded with Sidi Mohammed, in 1786, was ratified by Muley Soliman in 1795. By this treaty, it was stipulated that prisoners made in war should not become slaves. On the death of Muley Soliman, in 1822, his nephew, Muley Abderrahman, the present sultan, succeeded him. He has been principally employed, since his accession, in endeavouring to restore domestic tranquillity, and reduce the rebellious tribes of the interior. He is bigoted, indolent, and luxurious, but, as he is not remarkable for any extreme tyranny or cruelty, he is considered a good monarch. The last accounts from Morocco (1831) describe the country as torn by internal dissensions, the Breber tribes of the mountains having gained some important advantages over the imperial forces. But this unquiet state is the usual condition of the empire. Besides the works referred to in the article *Barbary*, the reader may consult Jackson's *Morocco*, and Brooke's *Travels in Spain and Morocco* (London, 1831).

MOROCCO (called, by the natives, *Marasch*); city, and capital of the kingdom of Morocco; lon. 7° 15′ W.; lat. 31° 37′ N.; population, according to Chenier, about 30,000; some reduce it to 20,000; others state it at 40,000 or 50,000; Jackson raises it to 270,000. It is said to contain 2000 Jewish families. It is situated about 120 miles from the sea, in a pleasant plain, planted with palm trees. It was founded in 1052 A. D., and, in the following century, under the reign of Ali Ben Yusuf, it was in its highest prosperity, and has been represented as containing a population of 1,000,000. This is probably very much exaggerated; but the circuit of its walls appears still calculated for at least 300,000. It is now very much depopulated, covered with ruins of houses and gardens; the streets are filled with the rubbish of decayed buildings; and the habitations, being old, swarm with vermin. The temples, sanctuaries, and mosques are still numerous, and some of the latter lofty and splendid. The emperor's palace is of hewn stone, ornamented with marble. The air is clear and healthy, and the city is well supplied with excellent water from the river Tensift, which flows at a short distance.

MOROCCO, or MAROQUIN; a fine kind of leather, prepared from the skin of the goat, originally brought from the Levant and the Barbary States, but now manufactured in most other countries. It derives its name from the empire of Morocco, where it was probably invented, or first became known to Europeans. The colours most commonly communicated to it are red (by cochineal) and yellow (by the Avignon or yellow berries).

MOROSINI, FRANCESCO, born 1618, was a gallant soldier, who, about the middle of the seventeenth century, in his capacity of governor of Candia, defended that island, with 30,000 men, against a Turkish force of four times that amount. Compelled at length to surrender, he obtained terms which were better observed by the Ottoman conquerors than was their wont; and although, on his return to Venice, he suffered a temporary disgrace, yet he soon recovered his credit with the government, and was appointed to the office of procurator of St Mark's. Sailing, afterwards, against his former antagonists, the Turks, he attacked their fleet, not far from the Dardanelles, and totally defeated it, with great loss both of ships and men. Returning in triumph to Venice, he continued to enjoy great popularity. In 1688, he was elected doge, and survived his elevation about six years, dying at Napoli di Romania, in 1694.

MOROXYLIC ACID; the name applied, by Klaproth, to an acid not yet fully examined, and which was found in combination with lime, forming a blackish-brown coating, on the trunk of a white mulberry tree, at Palermo. Its taste and other qualities approached nearest to those possessed by the succinic acid

MORPHEUS (from *μορφη*, form, because he assumes a variety of forms), in the Greek and Roman mythology; a servant of Somnus, or Sleep. He lived in a dark, silent cave, impenetrable by the rays of the sun, in Cimmeria. He is often confounded with the god of sleep, but is more strictly the god of dreams, and was often sent out to make known to mortals the will of the gods. He appeared only in a human form, his brother Phobetor (the Terrifier) being employed to assume the shape of beasts, and Phantasos that of inanimate objects. Morpheus is represented as a handsome youth, crowned with poppies, and holding in his hand a horn of plenty, from which he scatters various figures.

MORPHIA; a new vegetable alkali, extracted from opium, of which it constitutes the narcotic principle. It is obtained pure by the following process: A concentrated infusion of opium is boiled with a small quantity of common magnesia for a quarter of an hour: a considerable quantity of a grayish deposit falls: this is washed on a filter with cold water, and, when dry, digested in weak alcohol for some time, at a temperature beneath ebullition. In this way, very little morphia, but a great quantity of colouring matter is separated. The matter is then drained on a filter, washed with a little cold alcohol, and afterwards boiled with a large quantity of highly rectified alcohol. This liquid, being filtered while hot, on cooling, deposits the morphia in crystals, and very little coloured. The solution in alcohol and crystallization being repeated two or three times, colourless morphia is obtained. It crystallizes in double four-sided pyramids, whose bases are squares or rectangles; sometimes also in prisms with trapezoidal bases. It dissolves in eighty-two times its weight of boiling water, and the solution, on cooling, deposits regular and colourless crystals. It is soluble in thirty-six times its weight of boiling alcohol, and in forty two times its weight of cold alcohol. It dissolves in eight times its weight of sulphuric ether. All these solutions change the infusion of brazil wood to violet, and the tincture of rhubarb to brown. According to M. Bussy, morphia consists of

Carbon, - - - - - -	69.0
Hydrogen, - - - - - -	6.5
Azote, - - - - - -	4.5
Oxygen, - - - - - -	20.0
	100.0

With acids, it forms a class of salts in like manner as do the other vegetable alkalis. *Sulphate of morphia* crystallizes in prisms, which dissolve in twice their weight of distilled water. They are composed of

Acid, - - - - - -	22
Morphia, - - - - - -	40
Water, - - - - - -	38
	100

Nitrate of morphia yields needle-formed crystals in stars, which are soluble in one and a half times their weight of distilled water. *Muriate of morphia* is soluble in ten and a half times its weight of distilled water. The acetate crystallizes in needles, the tartrate in prisms, and the carbonate in short prisms. Tincture of galls is said to be a good test of morphia, free or combined. Subacetate of lead throws down all the animal matters with which acetate of ammonia may come to be associated in the stomach, without acting on that vegetable salt. The excess of lead may be separated from the clear liquor by a few bubbles of sulphureted hydrogen; and the morphia may then be recognised by crystallization *in vacuo*, and by the red colour which nitric acid imparts to it. No morphia is found in the blood of animals killed with it. Morphia acts with great energy on the animal economy. A grain and a half, taken at three different times, produced such violent symptoms upon three young men of seventeen years of age, that Sertürner was alarmed lest the consequences should have proved fatal.

MORPHOLOGY (from *μορφη*, form, and *λογος*, doctrine); the science which treats of the formation and constant change of organic bodies. Goethe, the German poet, first formed the word, and treated the subject as a separate branch of natural history. In his *Beiträge zur Naturwissenschaft überhaupt und zur Morphologie insbesondere* (Tübingen, 1817, et seq.), he directs attention to the uninterrupted change of all bodies, particularly organic bodies, and the fact of their consisting, even when they appear as single individuals, of parts which contain the germs of individual life within them. He shows this to be the case with plants from their propagation by eyes and cuttings. The growth from seed appears to him quite a similar phenomenon. Among animals, he adduces the instance of the *infusoria*. The polypes and some reptiles whose parts, on division, form entire animals, might likewise be mentioned.

MORRIS, Robert, the chief financier of the American revolution, was born in Lancashire, England, January, 1733—4, O. S., of respectable parentage. His father embarked for America, and caused him to follow at the age of thirteen. He received only an English education, and, before he reached his fifteenth year, was placed in the counting-house of Mr Charles Willing, at that time one of the first merchants of Philadelphia. Fidelity, diligence, and capacity gained him the full confidence and favour of Mr Willing, after whose death he was taken into partnership by his son, Thomas Willing, subsequently president of the bank of the United States of America. This partnership lasted from the year 1754 until 1793,—the long period of thirty-nine years. At the commencement of the American revolution, Mr Morris was more extensively engaged in commerce than any other merchant of Philadelphia. No one embraced the American cause with more zeal and firmness, and few with more influence and risk. He declared himself immediately against the stamp act, signed, without hesitation, the non-importation agreement of 1765, and, in so doing, the house of Willing and Morris made a direct and serious sacrifice of trade. In 1775, Mr Morris was appointed by the legislature of Pennsylvania one of the delegates to the second general congress. He was placed upon every committee of ways and means, and connected with all the deliberations and arrangements relative to the navy, maritime affairs, and financial interests. Besides aiding his country by his judgment and talents for business, he borrowed money, to a very large amount, on his personal responsibility, for the use of the government. This personal credit, growing out of his reputation for probity, ability, and resources, was wonderful, and of incalculable advantage to the American cause. It rarely failed, when the treasury yielded nothing for the public exigencies. In May, 1777, he was elected a third time to congress, by the legislature of Pennsylvania, and continued to be the soul of the financial concerns. Washington, to whom he was deputed by congress, in the autumn of 1777, conceived the utmost faith in his patriotism and ability, which all the subsequent events of their intimate intercourse and the connexion of Morris with public affairs served to perpetuate. In the year 1780, Mr Morris established a bank by subscription, of which his share was £10,000, mainly with the object of supplying the army with provisions,—3,000,000 of rations, and 300 hogsheads of rum. It continued until the following year, when the bank of North America was founded. His extensive commercial and private correspondence with Great Britain and the continent, furnished him with early and important political information. His constant manifestations of confidence in the issue of the revolutionary struggle inspired many others with the same sentiment. His whole example did incalculable service. February 20, 1781, he was appointed superintendent of finance, and, by subsequent resolutions of congress, vested with powers which gave him, in fact, the control of all the public pecuniary interests. This arduous office he admirably discharged until the end of the war. "The whole business of finance," said he, "may be comprised in two short but comprehensive sentences,—it is to raise the public revenue by such modes as may be most easy, and most equal to the people, and to expend it in the most frugal, fair, and honest manner." The condition of the treasury, when he undertook it, was nearly as bad as possible. Upon its improvement depended the preservation of the military force. The establishment of the bank of North America was one of his first and most beneficial measures. The notes of the institution were declared by congress receivable as gold and silver for the payment of all duties and taxes in each of the United States. Morris furnished the plan, and published it, with a cogent appeal to the patriotism of all American citizens. A contemporary writer has remarked that "the sudden restoration of public and private credit, which took place on the establishment of the bank, was an event as extraordinary in itself as any domestic occurrence during the progress of the revolution." At this time, the private fortune of Mr Morris was ample, but supposed to be much larger than it really was; and he rendered this personal credit subservient to the public good. He pledged it whenever his official resources were inadequate. His advances at particular times, on account of the confederacy or of individual states, were enormous. His general situation, and the impossibility of relieving all the wants which were referred to his department, exposed him to slanderous charges and harsh suspicions, which have in no instance withstood a fair inquiry. The necessary supplies of every thing required for Washington's expedition against Cornwallis were obtained chiefly by means of Mr Morris's credit. He issued his own notes to the amount of *one million four hundred thousand dollars*, which were finally all paid. These were the sinews of war, without which Cornwallis could not have been captured. The history of the difficulties which he had to evade or overcome, and the expedients to which he resorted in the course of his financial administration, would fill a volume. A number of them are related, with interesting details, in the sketch of his career, included in the Biography of the Signers of the Declaration of Independence. They are also stated, in the most instructive and impressive manner, in that part of his able and voluminous correspondence, which has been given to the world. January 24, 1783, Mr Morris announced to the president of congress his intention to resign the office of superintendent of finance. Nothing but the public danger could have induced him to accept it, and, the danger being past, he felt himself at liberty to escape from excessive toil and manifold liability. He consented, however, to serve until the first of May. On the 2d of May, after repeated conferences with a committee of congress, he was prevailed upon to continue in office, and he did not finally leave it until November, 1784. At his request, in May of that year, congress appointed a board of treasury commissioners, who were to co-operate with and succeed him in the management of the finances. In rendering an account of his stewardship, he published an able address to the inhabitants of the United States, containing excellent counsel. In September, 1781, congress had resolved that "until an agent of marine should be appointed, all the duties, powers, and authority assigned to that office should devolve on, and be executed by the superintendent of finance." The additional burden was irksome to Mr Morris. No agent was appointed, and he was thus obliged to administer the affairs of the navy, until the close of the year 1784. His expansive faculties, his habits of order, his energy and rigid justice in the transaction of business, enabled him to acquit himself creditably in this sphere. In 1786, Mr Morris consented to be elected into the assembly of Pennsylvania, in order to obtain the renewal of the charter of the bank of North America. Party spirit prevailed over his logic and eloquence; but the exertions of the friends of the institution were, in the succeeding legislature, crowned with success. In 1786 he was elected a member of the convention which framed the federal constitution. No man had more often and severely felt the want of an efficient government. He had incessantly asked for a stronger bond, or instrument, than the old confederation, for "a firm, wise, manly system of federal government;" and he strenuously co-operated in devising and recommending the present. In 1788, the general assembly of Pennsylvania appointed him to represent the state in the first senate of the United States, which assembled at New York. As a member of that body, he distinguished himself by wise counsels, and particularly by an irresistible speech for the repeal of the tender laws. He was a fluent, correct, and impressive orator; he wrote with ease and terseness; his fund of political knowledge could not but be ample; his acquaintance with the affairs of the world exceeded, in extent and diversity, that of any of his fellow patriots, Franklin excepted; his conversation was therefore replete with interest and instruction. When the federal government was organized, Washington offered him the post of secretary of the treasury, which he declined; and, being requested to designate a person for it, he named general Hamilton,—a most happy though not an expected choice. At the conclusion of the war, he was among the first who engaged in the East India and China trade. In the spring of 1784, he despatched the ship Empress of China, captain Green, from New York to Canton, being the first American vessel that ever appeared in that port. He also made the first attempt to effect what is termed an *out of season* passage to China. This passage is effected by going round the south cape of New Holland, thus avoiding the periodical winds prevalent at certain periods in the China sea. In prosecution of this object, the ship Alliance, captain Read, equipped with ten twelve-pounders, and sixty-five men, sailed from the Delaware, June 20, 1787, and arrived in safety, Dec. 22, at Canton, where considerable inquiries were made by the European commanders respecting the route that had been taken, as it was wholly a novel thing for a vessel to arrive at that season of the year. As no ship had ever before made a similar passage, great astonishment was manifested; and the lords of the admiralty subsequently applied to Mr Morris for information with regard to the track of the ship. It is said that her probable route was, previous to her departure, marked out by Mr Morris, with the assistance of Mr Gouverneur Morris. In his old age, Mr Morris embarked in vast land speculations, which proved fatal to his fortune. The man to whose financial operations the Americans were said to owe as much as to the negotiations of Franklin, or even the arms of Washington, passed the latter years of his life in prison, confined for debt. He sunk into the tomb on the 8th of May, 1806. Mr Morris was of large frame, with a fine, open, bland countenance, and simple manners. Until the period of his impoverishment, his house was a scene of the most liberal hospitality. It was open, for nearly half a century, to all the strangers of good society who visited Philadelphia. He was temperate in food, but fond of convivial meetings. No one parted with his money more freely for public or private purposes of a meritorious nature.

MORRIS, GOUVERNEUR, an eminent American statesman and orator, was born at Morrisania, near the city of New York, January 31, 1752. He was educated at King's college in that city, where he was graduated bachelor of arts in May, 1768. Immediately after he entered the office of William Smith (the historian of the colony), as a student of law. In 1771, he was licensed to practice law. His proficiency in all his studies was remarkable. He acquired early much reputation as a man of brilliant talents and various promise. His person, address, manners, elocution, were of a superior order. In May, 1775, Mr Morris was chosen a delegate to the provincial congress of New York. In June of that year, he served on a committee with general Montgomery, to confer with general Washington respecting the manner of his introduction to the congress. He entered with zeal and efficiency into all the questions and proceedings which referred to a vigorous resistance to the pretensions of the mother country. In 1776 (December), he acted as one of the committee for drafting a constitution for the state of New York, which was reported in March, and adopted in April, of that year, after repeated and very able debates, in which Jay, Morris, and Robert R. Livingston were the principal speakers. In July, 1777, he served as member of a committee from the New York congress, to repair to the headquarters of Schuyler's army, to inquire into the causes of the evacuation of Ticonderoga. In October of that year, he joined the continental congress at York, Pennsylvania, and, in 1778, wrote the patriotic and successful pamphlet called Observations on the American Revolution, which he published at the beginning of 1779. We must refer to the journals of congress for an account of his many and valuable services, rendered in that body to the revolutionary cause. In July, 1781, he accepted the post of assistant superintendent of finance, as the colleague of Robert Morris. He filled every office to which he was called with characteristic zeal and ability. After the war of the revolution, he embarked, with Robert Morris, in mercantile enterprises. In 1785, he published an Address to the Assembly of Pennsylvania on the Abolition of the Bank of North America, in which he cogently argued against that project. In December, 1786, he purchased from his brother the fine estate of Morrisania, and made it his dwelling-place. Here he devoted himself to liberal studies. In the following year, he served with distinction as a member of the convention for framing the constitution of the United States. December 15, 1788, he sailed for France, where he was occupied in selling lands and pursuing money speculations until March, 1790, when he proceeded to London as private agent of the American government with regard to the conditions of the old treaty, and the inclination of the British cabinet to form a commercial treaty. In November, 1790, he returned to Paris, having made a tour in Germany. In the interval between this period and the beginning of the year 1792, he passed several times on public business between the British and French capitals. February 6, 1792, he received his appointment as minister plenipotentiary to France, and was presented to the king, June 3. He held this station with great *éclat* until October, 1794. He witnessed the most interesting scenes of the revolution in the capital, and maintained personal intercourse with the conspicuous politicians of the several parties. The abundant memorials which he has left of his sojourn in France, and his travels on the European continent, possess the highest interest and much historical value. He made extensive journeys after he ceased to be minister plenipotentiary, of which he kept a full diary. In the autumn of 1798, Mr Morris returned to the United States, to engage in politics, with enhanced celebrity and a large additional stock of political and literary knowledge. He was universally admitted to be one of the most accomplished and prominent gentlemen of his country. In 1800 he entered the senate of the United States, where his eloquence and information made him conspicuous. The two eulogies which he pronounced—one on general Washington, and the other at the funeral of general Hamilton—are specimens of his rhetorical style. His delivery was excellent. Mr Morris, at an early period, gave special and sagacious attention to the project of that grand canal by which the state of New York has been so much honoured and benefited. In the summer of 1810, he examined the canal route to lake Erie. The share which he had in originating and promoting that noble work, is stated in the regular history which has been published of its conception and progress. In May, 1812, he pronounced a public and impressive eulogium on the venerable George Clinton; in the same year, an oration before the New York historical society; in 1814, another on the restoration of the Bourbons in France; in 1816, a discourse before the New York historical society. Mr Morris died at Morrisania, November 5, 1816. He passed the latter years of his life at Morrisania, exercising an elegant and munificent hospitality, reviewing the studies of his early days, and carrying on a very interesting commerce of letters with statesmen and literati in Europe and America. The activity of his mind, the richness of his fancy, and the copiousness of his eloquent conversation, were the admiration of all his acquaintance. A selection from his voluminous and valuable papers, accompanied by a sketch of his life, has been published by Mr Jared Sparks.

MORRIS-DANCE (from Morisco, Moorish), supposed to have been derived from the Moriscos in Spain, was formerly danced at puppet-shows, May-games, &c., in England. According to some writers, it was introduced into England in the reign of Edward III., when John of Gaunt returned from Spain; but it was more probably borrowed from France or the Low countries. In the reigns of Henry VII. and VIII., it was a principal feature in the popular festivals. In the May-games of Robin Hood, and the pageant of the Lord of Misrule, morris-dancers formed an important part. The more ancient May-game and morris consisted of the following characters: Robin Hood, Little John, Friar Tuck, Maid Marian, the queen or lady of the May, the fool, the piper, and several dancers, variously habited. A hobby-horse and a dragon were afterwards added. In the reign of Henry VIII., the morris-dancers were dressed in gilt leather and silver paper, and sometimes in coats of white and spangled fustian. Bells, to the number of thirty or forty, hung from their garters, and purses were stuck in their girdles. See Douce's *Dissertation on the Ancient English Morris-Dance*, in vol. ii. of his *Illustrations of Shakspeare*.

MORSE. See *Walrus*.

MORTALITY. The law of mortality is that which determines the proportion of the number of persons who die in any assigned period of life or interval of age, out of a given number who enter upon the same interval, and consequently the proportion of those who survive. Tables showing how many out of a great number of children, as 10,000, or 100,000, born alive, die in each year of their age, and consequently how many complete each year, and exhibiting this law through the whole extent of life, are called *tables of mortality*. The basis of such calculations must be an accurate register of the number of births and deaths, and in the case of the latter, at what ages, in a given district or extent of country. In England, the bills of mortality, or abstracts from parish registers, show the numbers who are born and die in the different parishes; and in other countries similar mortuary registers are kept. The results furnished by such tables are very various, and of great interest. If the registers are kept with sufficient accuracy and minuteness, they would enable us to determine the proportion of deaths, not only at different ages, and in different regions, but at different seasons, in persons of different occupations and habits, in towns, or the country, and would afford valuable materials for the science of political economy. Although much more attention has been paid to this subject in recent times, yet the observations have not been so extensive nor so accurate as is desirable. The first table of mortality was constructed by doctor Halley, from the mortuary registers of Breslau, for five years ending with 1691, and was inserted in his paper on the subject in the Philosophical Transactions for 1693, with many useful observations on the purposes to which such tables may be applied. In 1742, the celebrated work of Sussmilch on this subject appeared under the title of *Die gottliche Ordnung in die Veranderungen des menschlichen Geschlechts*, &c. (2 vols.), of which a third edition was published in 1775, with a supplementary volume by Baumann. Since that period, many valuable works have been published on the subject, by Deparcieux, Struyck, Birch, Muret, Messance, Price, Krafft, Barton (American Phil. Soc., 1793), &c., and registers have been kept more generally and with greater care. For different views of the subject, see *Annuities*, *Longevity*, *Physiology*.

MORTAR is a kind of short cannon, of a large bore, with chambers. Mortars are made of stone, brass, or iron. Their use is to throw hollow shells filled with powder, which, falling on any building, or into the works of a fortification, burst, and their fragments destroy every thing within reach; also balls of stone, carcasses (q. v.), bags filled with grape shot, &c. They were first used in sieges, for throwing great balls of stone and of red-hot iron, before the invention of shells. On this account, the caliber of a mortar, in Germany, is generally estimated by the weight of a stone of the size of the bomb which it is intended to throw. In Denmark and Russia, on the contrary, the caliber is estimated by the actual weight of an iron ball fitting it; in Britain and France, by its diameter in inches. In the larger states of Europe, ten, sixteen, twenty-five, thirty, fifty, and sixty pound mortars, according to the stone weight measure, are used. In the Prussian army, seven, ten, twenty-five, fifty, seventy-five pound mortars are customary. Formerly they were used even of 120 pounds' weight; but these are not employed at present, except in particular cases. Their length is generally from two and three-fourths to three and one-fourth times the diameter of the caliber. The interior parts of a mortar are the chamber, the bore, the mouth, the vent. The chamber is the place where the charge of powder is lodged. The shape of the chamber varies. It is generally conical, more or less truncated. *Land mortars* are those used in sieges, and mounted on beds. The beds are made of very solid timber, and placed upon very strong timber frames. The bed is so made as to turn round. *Stone mortars* serve to throw stones into the enemy's works, when near at hand. *Sea mortars* are those which are fixed in bomb-vessels, for bombarding places by sea. They are made much longer, and somewhat heavier than land mortars. The use of mortars is thought to be older than that of cannon, for they were employed in the wars of Italy to throw balls of red-hot iron and stones long before the invention of shells. It is generally believed that the Germans were the inventors, and that they were used at the siege of Naples, in the reign of Charles VIII., in 1435. It is more certain that shells were thrown out of mortars at the siege of Wachtendonk, in 1588, by the count of Mansfeld. For further information, see *Bomb*, and *Howitzer*.

MORTAR. See *Cement*.

MORTGAGE. A mortgage is a conveyance or transfer of real or personal estate to secure the grantee or assignee the payment of some debt, or the performance of some agreement, with a condition or understanding that, in case of the debt being paid, or the agreement being performed within a certain time, and in the specified manner, the conveyance or assignment shall be void, and the land, or personal property revert to, or rather, still belong to the mortgager. The English, and so the American mortgage of land is mostly borrowed from the civil law (see Kent's *Commentaries*, vol. iv., part 4, lecture 57; Brown's *Civil Law*, vol. i., p. 200), or, at least, many of the rules and incidents of the Roman *hypotheca* coincide with ours relating to mortgages. The essential characteristic of a mortgage, however, according to the import and definition of the term, must be the same in all countries, namely, an agreement that the property conveyed or transferred, whether real or personal, shall not absolutely go, and belong to the grantee or assignee, in case the debt intended to be secured shall be paid, or the contract, whatever it may be, intended to be guaranteed, shall be performed within the time and terms agreed upon. The rules and incidents of such an hypothecation will therefore have some resemblance under all codes of laws. There is no limitation of the kind of debts or contracts, the payment or performance of which may be secured by mortgage; for all legal ones may be so guaranteed. What will be a sufficient conveyance of the property, whether real or personal, will again depend on the laws of the place. A conveyance of land, for instance, must, in most countries, be made in writing, and with certain formalities. So in England, the right of property in a ship must appear by a bill of sale. Whatever these rules are by which the absolute transfer of property is regulated, they will equally apply to a conveyance or assignment by way of hypothecation. As real estate is usually required by the laws to be conveyed by written documents, and according to the laws of most places, these conveyances are evidenced by public records of the instruments by which they are made, there is no necessity of an open, visible possession of the estate by the grantee, that the public may take notice of the grant, for they may find the evidence of it at the office of public record. The case is not the same with personal property, the title to which is usually confirmed and established to the purchaser by a delivery of the article into his possession. In respect to all chattels, of which manual possession and transfer from place to place is practicable, the delivery by the vender, and actual possession by the purchaser, are very material circumstances in establishing the right of property in the latter. It is, indeed, laid down as a maxim of the English, and also of the American law, that movables cannot be validly sold or mortgaged without a delivery, actual or constructive, to the purchaser or mortgagee, and a possession by him. But this rule is very much modified and relaxed; not that a delivery to, and possession by the vendee and mortgagee are not considered requisite to establish his title, but a very liberal interpretation has been put upon circumstances showing a constructive delivery and possession. The object and policy of the law is to leave the movable, just as it does land, to be used either by the mortgager or mortgagee, without affecting their mutual rights and obligations as to the property in the thing, as far as this indulgence can be carried without leading other persons into a misapprehension, and exposing them to fraud and imposition in giving credit to the mortgager, upon the supposition of his being the absolute owner of the property hypothecated. The various rules and distinctions by which the mortgage of chattels is regulated in this respect, constitute an essential part of the law upon this subject. But, after all, we may lay it down as a general doctrine, that a mortgaged chattel must be in possession of the mortgagee, in order to render his title secure; and where the mortgage has, by the law, been permitted still to use the thing, it is only in cases where his possession is, in legal construction, that of the mortgagee. The most material consideration relating to mortgages, whether of lands or chattels, is the effect of the non-performance of the condition by the mortgager. This will depend, it is true, in part, upon the terms of the contract of hypothecation or mortgage. If it be agreed between the parties, that, in case of non-performance of the condition of the hypothecation, the mortgagee shall sell the thing hypothecated, whether land or goods, and account to the mortgager for the proceeds in satisfaction of the debt or discharge of the obligation intended to be secured, and pay over the surplus, if any, this is all that justice or the law can demand; and this is, in effect, what the law aims at where the parties do not make any such stipulation, but, on the contrary, agree, either expressly or impliedly, that, in case of a non-performance of the condition, the thing mortgaged shall be absolutely and immediately forfeited to the mortgagee, without any right on the part of the mortgager to redeem it, or to call upon the mortgagee to sell it and account with him for the proceeds. Thus, in the common form of mortgaging land, it is conveyed to the mortgagee with a provision, that in case he shall pay a certain debt, or do a certain thing within a time specified, the conveyance shall be void. According to the literal construction, therefore, if this condition is not complied with, the thing thenceforth belongs absolutely to the mortgagee. But here the law steps in and controls the agreement, and attempts to prevent it from operating as a penalty or forfeiture, at the same time giving it all its force as a security or guarantee. For this purpose, different modes are adopted in different codes of laws, all of which agree in applying the value of the thing mortgaged in satisfaction and discharge of the debt or obligation intended to be secured; so that by all the codes justice is done, if there is no surplus value. But if there be a surplus value, some of the codes will reach it, and others not, and the same code will reach it in regard to one kind of pledge, mortgage, or hypothecation, and not another. For example, by the English law, if a debtor pledges bills of exchange or any personal property for a debt, to an amount exceeding its value, the creditor must account for the proceeds, and pay over the surplus to his debtor; but if the debtor mortgages lands, of which the creditor takes possession for breach of condition, the debtor has three years to redeem it, after which time the land is absolutely gone, though twice the amount of the debt in value.

MORTIER. See *Cap.*

MORTIFICATION, in medicine, is the death of a part of the body while the rest continues alive, and often in a sound state. If the part be a vital organ, as the lungs, its death must necessarily be followed by that of the whole person. Mortification is called *gangrene* and *sphacelus*, when occurring in soft or fleshy parts, as in the stomach or the limbs; and *caries* when in a bone, as in the spine, in the skull, &c. It is caused by violent inflammation, by exposure to freezing cold, by hospital fevers, by languid, or impeded, or stopped circulation, as in cases of bedridden or palsied persons, and by improper food, particularly the spurred or mildewed grain. It may be recognised, when preceded by inflammation, by the following signs: subsidence of pain, heat and redness, and loss of sensibility; brown levidity, blistered skin, with bloody serum in the vesicles, offensive odour occurring in the part, and by a small, rapid, intermitting pulse; by shiverings followed with cold sweat, diarrhœa, delirium, hickup, dejection of spirits, and by a wild, cadaverous countenance. When a part having been frozen is suddenly exposed to heat, mortification rapidly ensues; the part becomes florid; inflammation is unsuccessfully attempted, and sphacelus is the result. In the above species a distinctly marked line divides the dead and living portions; often a healthy separation ensues. Mortification is common in the fevers, wounds, and injuries of the crowded jails and military hospitals of Europe. This gangrene is considered contagious by some surgeons, the nurses and orderlies suffering from ulcers and sloughs on the hands, when touched with the sponges used in cleansing the sick. The same effect is produced on the sound portions of the skin of the sick. This hospital gangrene is distinguished by its rapid spread to contiguous parts, as from fingers to arms, by the oozing of grumous blood, by horrible fetor, by fatal depression of spirits, and by the sullen despair of patients who, on the day of battle or of amputation, were the bravest of the brave. Sometimes the cutting a nail to the quick, or a slight bruise, will induce gangrene in old or debilitated persons.

Mildew mortification differs from other kinds in appearance and process, beginning with coldness and numbness in fingers or toes, without fever, but with spasms, and hebetude of mind; it separates arms, legs, or thighs, and nose. It is more often found in the voluptuous rich than in the labouring poor, in huge feeders than in free drinkers. It is thought to be connected with a diseased state of the digestive organs, and great nervous debility. Mr Pott sometimes checked it by opium in a few days, and, after the dropping off of the affected parts, the patients recovered health. There is a dry gangrene to which palsied persons, as well as others, are liable, which slowly destroys the limb, and commonly without inflammation or putrefaction. This is sometimes explained by the absence of warmth, and moisture, and air, which are removed by preceding atrophy—the colour livid, though sometimes nearly natural. When the bones of the leg mortify, or become carious, new osseous matter is provided, in sound constitutions. This process, occupying years when left to nature, is much accelerated by the artificial removal of the dead bone.

MORTMAIN. Lands held by a corporation are said to be held in mortmain (*mortua manu*, dead hand); the meaning of which is that the estate is a perpetuity, or, in other words, is not alienable. The expression has particular reference to estates held by the religious and eleemosynary corporations in England, which became objects of jealousy very early, it being apprehended that all the lands of the kingdom might come by conveyances prompted by the piety or superstition of proprietors into the hands of those corporations. Accordingly, conveyances and devises to corporations, civil or ecclesiastical, were forbidden by *magna charta*, and have been restrained and interdicted by subsequent statutes. In the United States, the amount of real estate that may be held by a corporation is usually limited in its charter, and it is also understood, as the general law, that any corporation can only hold land for the purposes of its incorporation, unless authority is expressly given in its charter. The English statutes of mortmain have been held to be in force in Pennsylvania (3 Binney's Reports. App. 626), but they have not been expressly recognised as being a part of the common law in other states.

MORVEAU, Louis Bernard Guyton de baron, a celebrated chemist, born at Dijon, January 4, 1737, distinguished himself, in 1773, by the invention of the method of purifying the atmosphere by means of chlorine, which is now generally employed with the greatest success. Morveau was previously general-advocate of the parliament at Dijon, an able man of business, eloquent and upright. He founded a school at Dijon for his favourite study chemistry, and, during thirteen years, himself conducted it. In 1801, appeared his *Déscription complète des Procédés de Désinfection.* In 1791 he was made member of the national assembly, afterwards of the convention. At the battle of Fleurus, he ascended in a balloon. In 1797, he retired to private life. Subsequently he was chosen a director of the polytechnic school, which he assisted to establish, and a member of the institute. After the restoration he was pensioned. He died January 2, 1816. His wife translated several chemical works from the English, Swedish, and German; also Werner's treatise on the exterior characters of fossils (1790).

MORVEN. See *Fingal.*

MORVIEDRO, or MURVIEDRO; a town of Spain, in Valencia, thirteen miles north north-east of

Valencia; lon. 22′ W.; lat. 39° 38′ N.; population 6273. It is supposed to be the ancient *Saguntum* destroyed by Hannibal, and which fell a victim to its fidelity to the Romans. It was afterwards rebuilt by the Romans with great splendour. The city of Morviedro is full of the remains of antiquity; the walls of the houses, the city gates, and doors of the churches and inns, are covered with Roman inscriptions. The most curious monuments are the castle and the theatre. The name is supposed to be derived from an allusion to this circumstance—*muri veteres* (ancient walls).

MOSAICS are imitations of paintings by means of coloured stones, pieces of glass, of marble, and even of wood of different colours, cemented together with much art. The name is sometimes supposed to be derived from *Moses*, as the pretended inventor; sometimes from *Musa*, in the sense of elegance, beauty; and sometimes from *μουσειον*, museum (a grotto consecrated to the muses), perhaps from the circumstance that mosaic work was first used in grottoes. The Italian *musaico*, as well as the French *mosaique*, originated from the word *musaicon* of the Byzantine Greeks, who first introduced the art into Italy. We know nothing with precision of the invention and history of this art in antiquity. Probably it originated in the East, but received its perfection from the Greeks, and was thus conveyed to the Romans in Sylla's time. In Italy, and in most of the countries occupied by the Romans, many floors ornamented with mosaic work have been found amongst the ruins. When, in the fifth century, the arts and sciences were driven from Italy by the distracted state of the country, this art was preserved by the Byzantine Greeks, and was restored to Italy in the thirteenth century, where it attained the highest perfection, particularly when Clement VIII., at the commencement of the seventeenth century, had the whole of the interior of the dome of St Peter's ornamented with this work. Giambattista Calandra improved mosaic by the invention of a new cement. He and many succeeding artists employed the art for copying original paintings of famous artists, and thus eternizing them in their original freshness and beauty; for one of the greatest advantages of this kind of painting is its wonderful power of preservation. In this manner Guercino's Martyrdom of St Petronilla, and Dominichino's Communion of the dying St Jerome, were preserved. Peter Paul, of Christophoris, founded, at the commencement of the eighteenth century, a school for mosaic in Rome, and many of his scholars carried the art to a still higher degree of excellence. In recent times two kinds of mosaic are particularly famous,—the Roman and the Florentine. In the former the paintings are formed by joining very small pieces of stone, which gives greater variety and elegance, and facilitates the representation of large historical paintings. The Florentine style, which makes use of larger pieces of stone, is far more troublesome, and is adapted only for small paintings. Mosaic in wood the Italians call *tansia* or *tarsia;* the French *marqueterie*. (See *Marquetry*.) In the most costly mosaics, precious stones have been cut to furnish materials; but in common works of this art enamels of different colours, manufactured for the purpose, are the material employed. The enamel is first formed into sticks, from the ends of which pieces of the requisite size are cut or broken off. These are confined in their proper places upon a plate of metal or stone, by a cement made of quicklime, pulverized limestone, and linseed oil. The cement is spread over the plate, and a drawing made on it to guide the artist before he commences his work. He has also constantly before him the painting to be copied. After the whole has adhered, it is allowed to dry two months, and is then polished with a flat stone and emery. Inlaid works, of agate and other costly stones, are executed on the same principle as mosaic, except that the stones are larger, and cut to the shape of different parts of the object to be represented, whereas in mosaic the pieces are of the same size and shape. The *opus reticulatum* of the ancients, with which columns and walls were sometimes incrusted, is found to consist of small stones, of a pyramidal form, the apex of which is imbedded in mortar, while the base, which is polished, forms the outer surface. A mode has recently been invented of sawing the plate with the mosaic paintings into two or three sheets, and thus multiplying the paintings. Should smoke or dirt soil the surface, it has only to be polished to be restored to its original beauty. In 1819, Fernbach, a native of Baden, invented a new kind of mosaic painting, imitating with surprising fidelity the colour, the juncture, the lustre, &c., of mineral bodies. Professor Blank's mosaics of moss have also attracted much attention.—See J. B. Blank's description of his *Mosaic Paintings* (Wurtzburg, 1820).

MOSAMBIQUE, or MOSAMBICO; a kingdom of Africa, on the east coast, and in that part of the Indian sea which passes between the continent and the island of Madagascar. It takes its name from the capital, situated on an island, the chief of three islands which form a part of the kingdom. The city of Mosambico is said to have once been very handsome; the houses well built, especially the churches and convents, and the fort, or castle, which is about a musket-shot from the town; but it is now much reduced. Mr Salt stated the population in 1809, at 500 Portuguese, 800 persons of Arabian extraction, and 1500 negroes. The trade is in gold, ivory, and slaves. The fort is one of the strongest and best contrived which the Portuguese have on this coast. The kings of Portugal spared no cost to fortify and garrison Mosambico, and to provide it with an hospital for the sick, and a well-stored magazine, with all necessaries for shipping, though the charge of keeping them up often exceeds the revenues it affords. Lon. 41° 38′ E.; lat. 15° 5′ S. The island of Mosambico, though the largest of the three islands, is nevertheless very small, not being above two bowshots in breadth, and about six in length; about two miles from the continent. The bay is about three miles in circuit, so that the points of land on each side advance into the sea. The other two, St George and St James, lie on each side of it, facing the continent in a direct line with it. Over against that of St George, and about a mile from it, is the cape called by the Portuguese *Cabo Cetra*, which is a peninsula, joined to the continent by a small neck of land, covered with the sea at high, but fordable at low water.

MOSAMBIQUE, STRAITS OF; that part of the Indian ocean which divides the island of Madagascar from the continent of Africa.

MOSCATI, PIETRO, a celebrated physician and statesman, son of one of the most celebrated surgeons in Italy, was born in 1736, at Milan. As his talents were obvious at an early period, his father cultivated them with the utmost care, and at length sent him to Tuscany, and afterwards to Turin, to study under the direction of Bertrandi and Beccaria. Moscati, after having taken his doctor's degree at Pavia, was appointed assistant physician to the hospital at Florence, where, and at Bologna, he diligently laboured in the acquisition of professional knowledge. In 1764, he was elected professor of anatomy and surgery in the university of Pavia, and published his anatomical lessons, and a Discourse on the physical Differences which exist between Man and Animals. Both of these works were well received, and the latter was translated into German.

In 1772, Maria Theresa nominated him professor of midwifery-surgery, and placed him at the head of a foundling establishment which she had formed. In 1796, Moscati espoused the cause of Italian liberty, and became a member of the Cisalpine congress. In 1797, Bonaparte selected him as one of the fittest persons to be a director of the Cisalpine republic; and, when Moscati wished to decline the office, the general replied to him, "If honest men refuse, I must appoint knaves." Moscati therefore accepted it; but he soon resigned, and resumed his medical pursuits. He was arrested by the Austrians, in 1799, and confined in the fortress of Cattaro, where, however, he was liberated to attend on the archduke Charles, who had fallen ill. After the battle of Marengo, he returned to Italy, and was one of the deputies sent to the *consulta* at Lyons. Under the government of Napoleon, he was successively made director-general of public instruction, a senator, a dignitary of the iron crown, grand eagle of the legion of honour, and a count. He was also highly respected at the vice-regal court, and was the favourite physician of the viceroy and vice-queen. Moscati was sincerely attached to Eugene Beauharnais, and was one of the senators who was the most active, in 1814, in endeavouring to raise him to the throne. He was afterwards one of the directors of the Italian institute, and president of the central council of health. He founded, at his own expense, a meteorological and astronomical observatory. In private life, he was universally esteemed for his many virtues, and the affability of his manners. He died in 1824.

MOSCHUS, a Greek pastoral poet, was a native of Syracuse. The time when he flourished is not accurately known, some making him a pupil of Bion, who is supposed to have lived under Ptolemy Philadelphus, while others suppose him a contemporary of Ptolemy Philometer (B. C. 160). The tenderness with which he speaks of Bion, in his beautiful elegy on that poet, implying a personal acquaintance, seems to render the former opinion most probable. A few idyls form the whole of the remains of Moschus, which exhibit great elegance of style and delicacy of conception. They are generally printed in conjunction with those of Bion (q. v.), and may be found in the *Poetæ Minores*, as also in a separate volume, by Mekercke.

MOSCOW (*Moskwa*); on the Moskwa and Neglina, in a fertile and richly cultivated country; lat. 55° 45′ 45″ N.; lon. 37° 33′ 8″ E.; the ancient capital of the Russian empire, and still the place of the emperor's coronation. It was also the imperial residence, till Peter the Great selected Petersburg for this purpose. Moscow was founded by the grand-duke Jurge I., in 1147, and enlarged by the grand-duke Daniel, about the year 1300. In 1383 and 1571, it was entirely destroyed by the Tartars, but each time soon rebuilt. A third time, 1611, it was burned by the Poles. The plague has also often produced a great mortality there; the last time, in 1771. In 1831, it was severely afflicted by the cholera morbus. Under Catharine II., Moscow was extended and embellished. It comprised, in 1812, in a circuit of about twenty-seven miles, five principal divisions: 1. the Kremlin (q. v.), that is, fortress; 2. Kitaigorod; 3. Beloigorod, with the buildings of the university, founded by the empress Elizabeth, in 1755; 4. Semlanoigorod, and, 5. thirty Sloboden, or suburbs. The town contained above 10,000 houses, among which were 288 churches. There were also numerous booths, and 350,000 inhabitants (20,000 of the number, soldiers), several imperial colleges, institutions for education and sciences, a large foundling hospital for 5000 children, and also the principal manufactures of the empire. Moscow has been, and still is, the centre of the trade of the interior, and a mart for enormous stores of goods of every description. This and the palaces and luxury of the high Russian nobility, who are here less dependent on the court, and principally pass the winter in this place, make it one of the largest and most magnificent cities of the world. The peculiarities of the national customs and character remained longer here than in the other cities. Recent times have given it great historical interest.

Moscow was the torch which lighted the fire of independence through subject Europe. When Napoleon advanced, in 1812, with the most numerous army which Europe had seen since the great migration of the nations, into the interior of the Russian empire, and her armies had in vain attempted to stay his course at the Moskwa (q. v.), near Borodino, Kutusoff determined, in spite of the opposition of many members of the council of war, to sacrifice the city in order to save the empire. The stores from the arsenal, together with the public treasures, had been already transported from Moscow, and secured. The greater part of the inhabitants followed, with their movable property; 17,000 wounded were conveyed in 4000 wagons, leaving only 2000 severely wounded and sick in the hospitals of Moscow. The army retired to Kaluga. (See the article *Russian-German War*.) The governor of Moscow, in the mean time (count Rostopschin) prepared to prevent the enemy from maintaining himself in the heart of the empire. He set fire to his beautiful country seat, near Moscow, and others, equally determined not to see their property in the hands of the enemy, did the same; and many citizens loudly exclaimed, that it would be better to burn Moscow than to give it up to the French. But count Rostopschin could only effect the departure of all the civil and military authorities, together with the officers of the fire-department, and 2100 firemen, with ninety-six fire-engines. These, as belonging to the military, were despatched from Moscow a day before the entry of the enemy. The prisons were not opened, but cleared, and 810 prisoners were conveyed to Nishnei-Novogorod, under an escort, two days before the arrival of the French. But half of the inhabitants remaining at Moscow (12—15,000) were a mere mob, many of whom may have profited by the universal disorder, to set fire to several houses that they might the better plunder. The conflagration of Moscow, which, in the course of three days, consumed three-fourths of all the houses, was, according to universal opinion, not accidental, but a preconcerted plan, and the order of count Rostopschin. The latter repelled the charge in his work *La Vérité sur l'Incendie de Moscau, par le Comte Rostopchine* (Paris, 1823), and contradicted the reports of the French army, disclaiming the honour of this great act; but he acknowledged that incendiaries had been taken in the act by the French, who had firebrands and rockets about them. According to the printed reports of the examinations, thirty persons were arrested by the French, thirteen of whom were shot, being convicted of having put fire to different parts of the city, by Rostopschin's command. It is known that the owners of the magazines of wagons, who occupy a whole street in Moscow, when they saw that the French officers, immediately on their arrival, had taken possession of these carriages, unanimously put fire to them, the following night, rather than see their property in the enemy's hands. Rostopschin also names many merchants who did the same with their houses, some of whom were surprised in the act, and immediately shot. Some of the French may also have been accessary to the conflagration, from carelessness, or for the sake of plundering. In the first night after the arrival of the

French, the large warehouses in the neighbourhood of the Kremlin were in flames; then the fire broke out in several parts of the city. The fifth day after the French had entered, a high wind carried the flames in every direction; so that, in the course of three days, 7932 houses were consumed to ashes. Napoleon having given permission that those houses which were on fire might be plundered, the soldiers did not exert themselves in subduing the flames. The Russians at that time maintained that the conflagration was entirely the work of the French, which added to the exasperation of the people. Even Kutusoff declared to Lauriston that he had only given orders to destroy several magazines. The rest had been done by the French. The following circumstances attended the entry of the French: Napoleon waited in vain for messengers to deliver to him the keys of the city. At last, a deputation appeared, consisting of twelve badly-dressed persons of the lower orders. Napoleon therefore did not attend to them. A young Russian, who had conceived the idea of issuing a proclamation in the name of Napoleon, was killed by the people. When the advanced guard of the French entered Moscow, Sept. 14, and proceeded to the Kremlin, a Russian peasant suddenly sprang forward, and killed a Polish officer, whom he had taken for Napoleon. Some of the citizens prepared to defend the Kremlin; but Murat brought forward his cannon, and they fell a sacrifice to their despair. On the fifteenth, at three o'clock in the afternoon, Napoleon entered with his guards, and took up his abode in the Kremlin. But volleys of smoke soon rose at a distance, and the flames proceeded from five hundred different quarters. The attempts to extinguish the flames and restore order were fruitless. All Moscow was on fire. It being impossible to subdue the conflagration, Napoleon left the Kremlin, and retired to castle Petrowskoi, a league from the city. His last words were, "Where you cannot extinguish, plunder!" Horrors upon horrors now succeeded: Moscow was burning till Sept. 21. At last, order and tranquillity were restored, on the first of October: but the "holy city" thus destroyed roused the people to vengeance against the French; and the army, in the midst of plundered treasures, was soon deprived of the very necessaries of life. Of 150,000 soldiers who had entered Moscow, Napoleon, in five weeks, had lost 40,000: thus retreat became unavoidable. From the 19th to the 22d of October, preparations were made for retiring, which were accompanied by new acts of ferocity and avidity. On the last day, it was resolved to destroy the Kremlin; but this only partly succeeded. Of 2600 stone houses, but 525, and, of 6600 wooden buildings, only 1797, were preserved. The entire loss which the fire and the war occasioned to the city and the government of Moscow, was estimated at 321,000,000 of roubles. The Russian government appointed a commissioner to make indemnification; but many of the inhabitants, who had lost the greater part of their property, did not hand in their estimates; thus, for instance, the loss of the two counts Razumowski, of general Apraxin, count Butterlin (whose library, worth a million, was entirely destroyed), and of general Rostopschin, amounted to five millions of roubles, in houses and furniture.

After the recovery of the country, the Russians were so actively employed in rebuilding Moscow, that, in the course of nine years, it had risen from its ruins in greater beauty than before the conflagration. The houses are principally of brick; the streets are paved with pebbles, and bordered with foot-paths; fifteen main streets diverge from the centre, terminating at the fifteen barriers; the principal squares are those of Loubianka, and of the poultry market, near the centre of the cities; the number of streets is 765; houses, 10,000, of which 8027 have been built since the conflagration of 1812; cathedrals 7; churches and chapels, 275, and 1 mosque, 21 monasteries, 56 hospitals, &c. The imperial university has a library of 33,000 volumes: the course of instruction includes the moral and political sciences, physics, mathematics, medicine, and polite literature. Several learned societies are connected with it. There are numerous other literary institutions. Some of the hospitals are very extensive, particularly the military hospital, with 1900 beds, which received 11,650 patients in 1823. The population, in summer, is 246,545, and, in winter, receives an increase of 150,000.

MOSELLE; a department of France. See *Departments.*

MOSELLE, or MOSEL (anciently *Mosella*), a tributary of the Rhine, rises in France, in the Vosges, and flows into the Rhine at Coblentz, opposite to Ehrenbreitstein. It runs through the French departments of the Vosges, the Meurthe, and the Moselle, the southern part of Luxembourg, and the Prussian province of the Lower Rhine. The length of its course is about 300 miles. Its principal tributaries are the Meurthe and the Saar. From Metz to Treves, it has a broad valley, but, below the latter place, it is confined by the branches of the Hundsruck. The mean breadth is about 500 feet; depth, seven to fifteen feet. The navigation is tedious, on account of the winding course of the river, and, in some parts, is difficult and dangerous. From Treves to Coblentz, the scenery on the river is very picturesque, almost every village and every group of hills presenting a beautiful landscape. The neighbourhood of Trarbach is charming; mountains, vine-clad hills, fertile valleys, interchange with each other, and several brooks run into the Moselle. The principal towns on its banks are Pont-à-Mousson, Metz Thionville, Treves and Coblentz. Wood for fuel and building, coal, iron, slates, wine, grain, &c., are brought down the river in large boats, eighty feet in length by twenty in breadth.

MOSELLE WINES; a sort of clear and dry wines, with a light, pleasant flavour and high aroma, produced in the countries on and near the Moselle. They are generally only first rate ordinary wines, but are sometimes of a superior quality. They come to maturity in about five or six years, but in a favourable season, they will keep twice that time without deterioration. The best are produced at Braunenberg, Graach, Wehlen, Zeltingen. The Pisporter, Drobner, and Neumagner are also esteemed. They are now much used in Prussia, on account of the high duties on foreign wines. The Moselle wines are often recommended for their diuretic qualities, and as preventive of obesity.

MOSES was born in Egypt, about 1600 B.C., among the then severely oppressed Hebrew people. Three months after his birth, his father, Amram, and mother, Jochebed, both of the race of Levi, were obliged to expose him, in obedience to a royal command, which enjoined that all the male children of the Hebrews should be put to death. But the daughter of the Egyptian king (a tradition preserved by Josephus names her Thermutis), going to bathe in the Nile, found the child exposed in a carefully constructed basket of bulrushes upon the border of the river, and took compassion upon him. His sister Miriam, who was standing near, offered to procure him a nurse, and immediately summoned his mother. The feelings of his unhappy people were therefore instilled into him with his mother's milk, and he returned, when he had reached a fit age for instruction, to the king's daughter, who named him *Mo-udsche* (whence the Hebrew *Mocheh*), signifying one delivered from the waters, and adopted him as her son. He was afterwards educated for the duties of the priesthood, to which the royal family belonged, and could now, as the disciple of the priests, attain to all the arts and knowledge which this privileged caste carefully confined within the limits of their order. The means of instruction thus afforded him were the best which his time possessed; and Moses penetrated still deeper than his instructers into the secrets of their religion, physics, legislation, and government, as appears plainly from his words and actions. His expedition into Ethiopia, in the fortieth year of his age, as leader of the Egyptians, when he subdued the city of Saba, won the affections of the conquered princess Tharbis, and married her, rests only on the tradition preserved by Josephus. Yet Moses could not forget his people in the splendour of a court: an outrage committed by an Egyptian on a Hebrew excited his anger, and he secretly slew the Egyptian. But this deed became known, and he escaped the pursuit of the king only by a hasty flight into Arabia. Here he took refuge with Jethro, a Midianitish prince and a priest, and espoused his daughter Zipporah, whom at their first meeting, he had rescued from hostile shepherds. Thus the adopted son of a king's daughter became the herdsman of an Arabian, and history does not say that he aspired to any thing greater. But the misery of his nation must have been continually present to his mind, and not in vain had he been led, by extraordinary means, into the sanctuary of Egyptian wisdom, and endowed with the rarest powers and knowledge. This knowledge occupied his mind in his solitude, and explained to him the secrets of nature, whose mysteries and wonders addressed him in a solemn tone amid the deserts and mountains of Midian, and elevated his heart to that God whom he discerned more clearly than his fathers. Yet the germ of his great undertaking remained for a long time maturing in his mind, before it was brought to light, and assumed the form of a deeply-meditated plan. Moses had already attained to an age which gives mature experience, patience, and tranquillity of mind, when this took place through an immediate interposition of God. While he was feeding his flock on mount Horeb, he saw a bush on fire, and, considering why the bush was not consumed, he heard the voice of the Lord proceeding from it, who announced himself to him as the God of Abraham, Isaac, and Jacob, and commanded him to lead his people out of Egypt into the land which he had promised to the patriarchs. The name *Jehovah*, by which God declared himself, was already known to him by means of the Egyptian mysteries, and conveyed the idea of the one, everlasting and unchangeable. But not without anxiety, arising from the view of the difficulties which he should meet with, and from his modesty, did he determine to obey this call. Pharaoh, he thought, is hard and unbelieving, he himself outlawed, his people rude, and incapable of comprehending the idea of the God whom he should announce to them. Being slow of speech, and possessing none of the arts of an orator, his words will not be believed without visible signs. God therefore gives him power to prove his mission by miracles, and joins to him his elder brother, Aaron, as a speaker. Thus prepared, Moses becomes confident that he shall succeed, with the assistance of God, and returns to Egypt, a gray-haired man of eighty years, to undertake the work. All the difficulties which he had foreseen, and yet greater ones, opposed him. He had the eloquence of Aaron, it is true, to aid him, and the people of Israel must recognise the hand of God in his deeds; but, degraded by long slavery, they wavered between belief and doubt. In vain did he produce changes in the ordinary course of nature, which could not be imitated by the art of the Egyptian sages, and for the performance of which a higher power was obviously requisite. The tenth of the destructive plagues which afterwards came upon Egypt—the destruction of all the first-born—first moved the hardened heart of Pharaoh to allow the Hebrews to depart. Moses placed himself at their head, and conveyed them, with all their possessions, out of Egypt, passing, under the protection of God, through the midst of the Red sea, in which the faithless Pharaoh, pursuing them, was drowned, with the army which followed him. Yet this deliverance from a formidable enemy was only the beginning of his enterprise. A rude, tumultuous people was around him, who, until now, had obeyed the scourge of their task-masters, but knew not how to live in freedom. Their distress in the desert excited loud murmurs; their meeting with the hostile Bedouins occasioned bloody combats; the jealousy of the elders produced dissensions and opposition to their leader; his life was often in danger, and he was often obliged to maintain his authority by force and severe punishments. But, with wonderful wisdom, he remained firm, in spite of all opposition, to his plan of transforming the stubborn multitude into a devout, civilized, and independent people. He supplied the hungry with food from heaven, and, opened to the thirsty new fountains upon the rock of Horeb, by the aid of God, who granted to his petition what the people needed. In all his ordinances, he declared himself to have the express command of God, who wished to draw his people to himself, and to form their hearts by love and fear. Religion is the spirit of the law which Moses began to announce three months after his departure from Egypt.

Arrived at Sinai, a mountain of Arabia, he allowed the people to encamp, while he himself ascended the holy summit to pray, where, surrounded with thunder, and trembling at the presence of God, the laws were announced to him which were to regulate the lives of the Israelites. Founded upon the faith of the patriarchs, these laws are rather a restoration of the simple truths which had governed the primitive world than a new religion. As presented by Moses, they were purified from the errors and follies of superstition, which had gathered round them among idolatrous nations, and were exhibited in a form adapted to the wants of the Hebrews, who had grown from a single family to a rude, ungoverned multitude. The great object of his legislation is to inculcate the doctrine that Jehovah is the only God, who will allow no other god besides himself, nor any visible image of his being; that he is himself the King of his people, and that he will rule them by his priests: hence the laws by which Moses regulates the worship of the Hebrews, the administration of the government and of justice, and even directs their manners, and lays down rules for the care of their health, bear the marks of their heavenly origin. Arising from the wants of the moral and physical nature of man, they are excellently adapted to the peculiar character of the people, to the climate, and to the political position of the land appointed for their dwelling, and to the plan of Providence of making this people the depositary of a divine revelation, to be developed in the fulness of time, and finally extended over the world. These laws forbid intermixture with other nations, the introduction of foreign customs, and the adoration of strange deities. As a people peculiarly dedicated to God, the Hebrews were to be separated from all neighbouring nations, and to stand separate and independent, relying upon God as their Lord and Master. Regulations, extending to the minutest particulars of the daily occurrences of life, in which even the selection and preparation of their food, and the care of personal cleanliness, were not forgotten, gave them habits adapted to their character and religious destination. A ritual, composed of a thousand minute ceremonies, and, as a whole, allegorically designating a covenant with God, to be incessantly renewed by offerings, prayer, and purification, imposed on them the duty of continual diligence in the service of their heavenly King. To the race of Levi, to which Moses belonged, he assigned the care of the religious service, and of seeing that the laws were obeyed, investing, not his sons (whom he allowed to take their place among the common Levites), but the descendants of his brother Aaron, as God commanded, with the first office in the kingdom,—that of high-priest. To this tribe, excluded from all property in land, the other tribes were to pay tithes: they were subjected to the authority of elders and judges, and the firmness of their political union was secured by certain festivals, to be celebrated by them in common, and by exclusive devotion to the service of God in the tabernacle,—a movable temple, regarded with awe, as the appointed dwelling of Jehovah, into the interior of which the priests alone were allowed to enter, and where, moreover, all the taxes were deposited, so that it was the central point of all the riches of the nation.

These are the chief points in the legislation of Moses, which, even if it displays some Egyptian features, yet plainly manifests the endeavour to wean the Hebrews from Egyptian customs and prejudices, and to elevate them to political and religious independence, and far surpasses, in originality and elevation of principle, in consistency and expressiveness, and, what most proves its heavenly origin, in proofs of true humanity, the boasted legislation of Solon and Lycurgus. Yet its importance was not at once recognised by the Hebrews.

When they were already near the end of their journey towards Canaan, Moses saw himself compelled, in consequence of new evidences of discontent, to lead them back into the desert, and forty years of toilsome wandering must be passed there: the severe punishments which the law threatens against transgressors must be executed in all their rigour: all those who had attained to man's estate at their departure from Egypt must die, before the law could be thoroughly known, and become habitual with those who had been born during the wandering. Moses himself, distressed with cares, troubles, and occupations of all kinds, was not permitted to live to see the complete accomplishment of his plan, on account of a murmur which, in the midst of his distresses, he allowed to escape against his God. After he had appointed Joshua to be the leader of the Hebrews, and had taken a solemn farewell of the people, he ascended a mountain in Peræa, beyond Jordan, from which he surveyed the land of promise, which he could not enter, and closed his eventful life in his 120th year. He prevented all superstitious reverence for his bones by his command, that his remains should be buried secretly, and the place of his grave concealed from the people.

The books which stand under his name at the head of the Old Testament are the monument of his worth. As it has been supposed that the material upon which he wrote was stone, and as it was hardly possible for works of the size of the Mosaic to be written at length on such a material, critics have attributed their collection, and arrangement in five books (whence their name, in Greek, *Pentateuch*), to a later writer, of the time of David or Solomon. But M. Greppo, in his essay on the hieroglyphic system of Champollion) translated by Isaac Stuart, Boston, 1830), maintains that Moses might have written on papyrus, and refers to an Egyptian manuscript on papyrus, in the museum at Turin, containing an act drawn up in the reign of Thouthmosis III., two centuries at least before Moses; and it is generally admitted that much must have been written by him, as the laws, which he could not trust to uncertain tradition, in the books of Leviticus and Deuteronomy. It is equally certain that he is the author of the magnificent songs, in which he celebrates the deliverance of the Israelites from the Red sea, and blesses and takes leave of the people before his death. The collection of the several portions of his writings into a whole, may be the work of a later time, which cannot be fixed within more precise limits than those above-mentioned.—See Michaelis's *Introduction to the Scriptures of the Old Testament* (in German); Astruc's *Conjectures upon the original Sources from which it appears that Moses composed the Book of Genesis* (in French, 1753); De Wette's *Contributions to the History of the Old Testament* (in German, Jena, 1804); Vater's *Commentary upon the Pentateuch* (in German, Halle, 1805); Eichhorn's Augusti's Berthold's *Introductions to the Old Testament* (in German); Faber's *Horæ Mosaicæ, or Dissertations on the Pentateuch.*

MOSES; a sort of boat. See *Boat.*

MOSES, CHORONENSIS, an historian and geographer, and archbishop of Chorene, now Kerona, in Armenia, flourished about A. D. 462. (See *Armenian Literature.*) His principal work, a History of Armenia, from the Deluge to the Middle of the fifth Century, was first published with a Latin version, by John and William Whiston, in 1736, and, though mixed up with a great deal of fable, is a valuable history, containing many narratives not elsewhere to be found. He was also the author of an Abridgment of Geography, first published at Amsterdam, in 1668, and several canticles, which are sung in Armenian, on the anniversary of Christ's presentation to the temple.

MOSHEIM, JOHANN LORENZ, one of the most distinguished German theologians, was born at Lübeck, in 1694, studied at Kiel, and, in 1719, became a member of the faculty of philosophy there. His reputation as a teacher, writer, and preacher, soon procured several flattering offers of promotion, which he declined; but, in 1723, he accepted the place of professor of theology at Helmstädt, where he was soon after (1726) made ecclesiastical and consistorial counsellor, and abbot of Marienthal and Michaelstein. With these places he also held that of inspector-general of the schools in the duchy of Wolfenbüttel. In 1747, he was appointed chancellor of the university of Gottingen, where he remained till his death in 1755, lecturing daily on ecclesiastical history and most other departments of theology. Dr Mosheim was the father of ecclesiastical history. His principal work on this subject is the *Institutiones Historiæ Ecclesiasticæ, Libri iv.* (Helmstädt, 1755), which was afterwards published under various other forms, and translated into German, with additions; also into English, by doctor Maclaine. His *Sittenlehre der heiligen Schrift* (5 vols., 1573), continued by Miller (4 vols.), is valuable for its completeness, and for its practical character. In the department of pulpit eloquence, he rendered important services by his *Anweisung erbaulich zu predigen*, and by his *Heilige Reden*, and is considered by the Germans the father of sacred eloquence in Germany, and an improver of German didactic prose.

MOSKWA, BATTLE OF THE (called by the Russians the *battle of Borodino*, from the village of that name, on which their right rested); gained by Napoleon, September 7, 1812, over the Russians under Kutusoff, who had taken the command August 29. The Russian commander took his position, September 1, at Borodino, with the purpose of defending the capital against the advancing enemy. The Russians occupied a gentle rising on the left bank of the

Caluga, from the confluence of that river with the Moskwa to the wood through which the Kaluga road passes: their right wing was covered by the village of Borodino, situated on a height on the left bank of the Kaluga: 2000 paces to the left, in the rear, was a large redoubt. The left rested on a wood at the village of Seminovska, and was covered by works thrown up in front, and connected with the centre by a redoubt. The centre was covered by a ruined village. Works were also thrown up to cover different parts of the position. Barclay de Tolly commanded on the right, Bennigsen in the centre, and Bagration on the left. On the fifth, Napoleon, having reconnoitred the Russian position, took possession of the redoubt in front of the left wing, previous to a general attack. The attack began early in the morning of the seventh. The French, after making an impression with their artillery and musketry, marched forward to a simultaneous attack on particular points. Success was most doubtful in the centre, where the Russians at one time recovered the great battery, after it had fallen into the hands of the French, and drove them back with great slaughter; but the failure of the Russian left enabled the enemy to throw a mass of force upon the point, which could not be withstood. The French had first got possession of the batteries by eight o'clock, but the fighting continued till late in the afternoon. The Russians retreated in good order, and without loss, no pursuit taking place. The French force amounted to about 150,000 men; the Russian was somewhat less; 50,000, dead and dying, covered the field. The Russians acknowledged a loss of 25,000 men, among whom was Bagration. Murat, Ney, and Eugene Beauharnais, distinguished themselves. See *Russian-German War*, and *Ney*.

MOSQUE (*medsched*); a Mohammedan house of prayer. These buildings are constructed in the Moresque or Saracenic style of architecture (see *Architecture*, vol. i., p. 234), and display, in unceasing variety, all the peculiarities, both ornamental and unornamental, of that rich and superb style. The mosques of the Arabs often include, in a quadrangular area, an immense quantity of columns ranged in files, the multiplicity and extent of which impress the mind of the beholder with surprise and admiration. These columns are, in numerous instances, the rich spoils of antique monuments. Upon the site (it is said) where formerly stood the famous temple of Solomon, a superb mosque has been erected at Jerusalem. If the Arab temples astonish by their huge extent and prodigious colonnades supporting their arches and vaults, those of the Turks possess another kind of claim to notice and admiration in the grandeur and height of their various cupolas. Every province of Turkey has its own particular style and taste with regard to these religious structures; and, as the Moresque architecture possesses no fixed rules, deeming lightness and elegance alone to be the fundamental laws of the art, the architect is allowed to follow the bent of his own fancy freely. In these Mohammedan churches we find neither altars, nor paintings, nor images, but a great quantity of lamps, of various kinds, which form the principal interior ornament, and some sentences from the Koran written on the white walls. Every mosque has its minaret or minarets (q. v.). The mosques are quadrangular, and have fountains in the court for ablutions. The entrances are hung with chains in such a manner that no one can enter without stooping. The floor is generally covered with carpets, but there are no seats. In a corner on the south-eastern side is a chair, on which the iman is seated when he reads the prayer. In the direction towards Mecca is a tablet, or recess in the wall, in which are usually some copies of the Koran, to direct the worshippers where to turn their eyes:—this is called the *kebla*. The *dshamis* differ from the mosques. In the former, the divine service on Friday, as well as the prayer for the emperor (*kutba*), is held. The finest of the mosques in Constantinople is that of St Sophia. Usually none but Mohammedans are permitted to enter a mosque; but to this there are exceptions. Thus the mosque of St Sophia, by an ancient custom, was open to every Venetian ambassador for a fee of some ducats, and also to others. The imperial mosques have frequently public schools (*madras*), hospitals (*imarets*), and also kitchens for cooking food for the poor. Their income is derived from certain districts and estates, whose inhabitants enjoy great privileges.

MOSQUITO. See *Gnat*.

MOSSES (*musci*); a natural family belonging to the *cryptogamia* of Linnæus, consisting of little herbaceous plants, having simple or branching stems, which are furnished with very numerous and more or less imbricated leaves; the roots are capillary, annual, or perennial; the leaves are small, simple, sessile, embracing the stem, and entirely or minutely serrated on the margin: they are always continuous with the stem, and never fall off. Water is absorbed by the leaves very rapidly, and when a dried moss is dipt in water, it very soon resumes the freshness and appearance of life. It is to be observed, however, that those parts only which are moistened resume their wonted vigour, while the remainder continues dry, as before. The internal structure of mosses is entirely cellular, and they are destitute of stomata. Their parts of fructification are double, terminal or axillary, on the same or on different stems. The female flower consists of a sort of urn, situated upon a long pedicel, closed above with a lid, and covered with a sort of hood or veil: the lid is usually deciduous; and when it has fallen, the internal border of the urn is seen to be provided with one or two membranes, which terminate in regular teeth, the whole appearing like a fringe. In one genus the teeth are wanting; but when present, they are always in number four, or one of its multiples. In some instances, the teeth are divided half way by a fissure. The seeds are very small, globular, exceedingly numerous, and reddish or brown at maturity: according to Hedwig, they are attached to the sides of the urn. Mosses are found in cool, airy, and moist situations, in woods, upon the trunks of trees, on old walls, the roofs of houses, &c. They grow in tufts, forming carpets which often cover a considerable extent of ground. Some of them are entirely aquatic. About 800 species are known, which are now distributed into several genera. They are most numerous in the temperate parts of the earth, and especially in mountainous regions. From the situations in which they are found, they are frequently exposed to be dried up during the summer; but a slight rain quickly restores their usual freshness. The term *moss* is often, but improperly, applied to lichens.

MOSSOP, Henry; an eminent tragic actor, born in Ireland, in 1729. He was the son of a clergyman who held a rectory in the province of Connaught, and was educated at Trinity college, Dublin, where he took a degree. He made his first appearance on the stage at Dublin. He afterwards removed to London, where, next to Garrick and Barry, he was esteemed the principal tragedian of his time. In 1761, he became manager of one of the Dublin theatres, in opposition to Barry and Woodward; and the rivalry proved ruinous to all parties, and especially so to Mossop, whose vanity and intemperate conduct having at length excluded him from the exertion of his professional abilities on the metropolitan stage, he was reduced to great distress, and died in absolute penury, at Chelsea, in November, 1773.

MOSS-TROOPER; the usual appellation (says Scott, note thirteen to canto first of the Lay of the Last Minstrel) of the marauders upon the borders of England and Scotland. Long after the union of the crowns, the moss-troopers, although sunk in reputation, and no longer enjoying the pretext of national hostility, continued to pursue their calling. Fuller says, "They are called *moss-troopers* because dwelling in the mosses, and riding in troops together. They dwell in the bounds or meeting of the two kingdoms, but obey the laws of neither. They come to church as seldom as the 29th of February comes into the calendar. They are a nest of hornets; strike one, and you stir all of them about your ears. Indeed, if they promise safely to conduct a traveller, they will perform it with the fidelity of a Turkish janizary; otherwise, woe be to him that falleth into their quarters." Speaking in reference to his own time, he says, "They amounted, forty years since, to some thousands. They compelled the vicinage to purchase their security by paying a constant rent to them. When in their greatest height, they had two great enemies, *the laws of the land, and the lord William Howard of Naworth*. He sent many of them to Carlisle, to that place where the officer *doth always work his work by daylight*. Such was the success of this worthy lord's severity, that he made a thorough reformation among them; and, the ringleaders being destroyed, the rest are reduced to legal obedience, and so, I trust, will continue." (Fuller's *Worthies of England*, page 216.) The last public mention of moss-troopers, says Scott, occurs during the civil wars of the seventeenth century, when many ordinances of parliament were directed against them.

MOSTARABS. See *Arabia*.

MOST CHRISTIAN MAJESTY; a title borne by many kings of France, as by Pepin the Short, but which was first solemnly conferred on them by pope Paul II., in 1469. According to some, pope Pius II. gave this title to Louis XI., to atone for his refusal of the request of that king that, as *suzerain* of Naples, he would assist prince John of Calabria, the kinsman of Louis, against Ferdinand of Naples.

Most Faithful Majesty is a title which was given by Benedict XIV. to John V. of Portugal.

MOSUL, or MOSSOUL; a city of Turkey in Asia; capital of a pachalic included in the pachalic of Bagdad, in a plain on the west bank of the Tigris; 240 miles east of Aleppo, 480 west-north-west of Ispahan; lon. 42° 8′ E.; lat. 36° 20′ N.; population, according to Oliver, about 70,000; 25,000 Arabians, 16,000 Turks, 15,000 Kurds, 8000 Armenians and Nestorians; according to others, 35,000. It is surrounded with walls and ditches, and defended by a castle. Almost all the houses are built of stone. The Tigris is deep and rapid, and is crossed by a bridge of boats. The air is healthy in spring, hot in summer, feverish in autumn, and inconveniently cold in winter. The inhabitants consist of Arabians, Turks, Persians, and Kurds, all which languages are spoken. The Nestorian patriarch of Syria resides at Elkasch, near the town, where also are found many Christians, Armenians, Greeks, and Maronites. This city is very large, and contains many handsome buildings, exclusive of mosques, minarets, and hummums, which are of hewn stone. The bazar is large, and well supplied. The commerce is considerable, and there are manufactures of leather and cotton, particularly *muslins*, said to be named from this place. The town is surrounded by a strong and high wall of stone, but all the space enclosed is not occupied with houses, and many places are covered with ruins, which show that it was once more populous than it now is; however, the inhabitants carry on considerable manufactures of cotton. Merchandise from India is brought hither by the way of Bassora, and European goods by the way of Aleppo. About a mile from Mosul, on the opposite bank of the river, are mounds, similar to those of Babylon, supposed to be the remains of ancient Nineveh.

MOTANABBI, Abul Tayib Ahmed al; a celebrated Arabian poet, born at Cufa in 915. He studied at Damascus, and applied himself especially to grammar and the belles-lettres. At length, being inflamed with a passion for poetry, he gave himself up to the cultivation of that species of literature with the utmost enthusiasm, and professed to believe that he was divinely inspired. He aspired to become the rival of Mohammed, and, by the charms of his versification, seduced a multitude of the Arabs to become his disciples. The governor of Emesa stopped the progress of the new sect, by seizing their chief, and dispersing his followers. Motanabbi, reduced to reason by confinement, renounced his chimerical pretensions to inspiration, and, on regaining his liberty, applied himself wholly to poetical composition. He was entertained at the court of the prince of Aleppo, whence he removed to Egypt, and afterwards to Shiraz, where he was loaded with benefits by the sultan Adadodowla. He was at length killed by robbers in crossing the desert to visit his native country, in 965. A memoir of Montanabbi, with two of his poems, may be found in Ouseley's Oriental Collections. His Divan (q. v.), a collection of 289 poems, has exercised the industry of more than forty commentators. Von Hammer first gave a complete translation of them (Vienna, 1824), with notes. He was called in the East, the *sultan of poetry*. See *Arabian Literature*.

MOTET (from the *French*) formerly signified a studied composition enriched with all the beauties of the musical art. At present, the name of *motet* is given to every composition set to Latin words; such as hymns, psalms, or any small portion of scripture, in the Roman Catholic church. In Germany, the name is given to figured musical pieces, generally intended only for singing, the subjects of which are passages of the Bible. There are some for four, five, six voices. The motets of France and Italy are always accompanied by instrumental music. The subjects are also passages of the Bible, generally in rhymed Latin verses, whilst the words of the German *motet* are in prose. The German *motet* is chiefly confined to the Protestant part of Germany. The two Bachs (q. v.) may be said to have carried the German *motet* to its highest point.

MOTH (*phalæna*, L.). These numerous and beautiful insects, which are seldom seen except in the evening or night, were included by Linnæus in the genus *phalæna*. Since his time, however, naturalists have divided them into an immense number of different groups. (See *Entomology*.) All the diurnal butterflies are provided with a tongue for gathering their food; but a great proportion of the moths are destitute of that organ, whilst in others it is exceedingly small. A considerable number of them, therefore, must pass the whole of their winged state without food. The caterpillars, from which the various species of the perfect insects are produced, exhibit nearly the same variety of appearance as the moths themselves. Some are large, and others extremely minute; many are furnished with ten, others with twelve or fourteen feet, whilst the largest have sixteen. All these caterpillars, after having shed their skin one or more times, spin for themselves the materials of a habitation, in which they are to undergo their transformations.—The most remarkable and useful of these caterpillars is the silk-worm (q. v.), originally a native of China and other Eastern countries, from whence it was imported into Europe during the reign of the emperor Justinian. If, however, one species ministers to our comfort and luxury, there are others which are capable of committing great devastations among all articles composed of woollen or fur, &c. Thus the *tinea sarcitella* destroys woollen clothes; the *T. pellionella* attacks furs; the *T. flavi-frontella* damages collections of natural history; the *T. granella* commits great ravages among grain, &c. The clothes-moth itself is perfectly innocuous. The devastation is committed by the caterpillar. This begins to form a nest as soon as it quits the egg. For this purpose, having spun a thin coating of silk round its body, it cuts filaments of wool or fur close to the thread of the cloth, and applies the pieces to the outside of its case. This covering it never leaves, except in cases of urgent necessity. When it wishes to feed, it puts out its head at either end of the case, as may be most convenient. When it wishes to change its position, it protrudes its head and about half its body, and thus moves forward, dragging its case by fixing its hinder legs firmly in it. When, from its increase in size, the case becomes too small, it makes an addition to it at each end. This operation can be readily traced by transferring it from cloth of one colour to another, when each addition will be conspicuous, from the difference of colour. After changing into a chrysalis, it remains quiescent for about three weeks, when a small nocturnal moth, of a silvery-gray colour, comes forth, but too well known to almost every mistress of a family. The usual mode of destroying these pests is by oil of turpentine, camphor, or tobacco, all of which will answer the purpose to a certain degree; but all have the disadvantage of communicating odours to the clothes, to which they have been applied, extremely disagreeable to many persons. As moths never attack *unwashed* wool, and even abandon the places where it is kept, this substance may be advantageously substituted for the above-mentioned articles by placing it in layers between clothes, or keeping small parcels in the corners of shelves or drawers. For this plan to be effectual, the wool must be used as it comes from the back of the animal, before any cleansing process has been employed that will deprive it of its natural oil or smell.

MOTHERWELL, William, a very beautiful writer of Scottish ballads, was born in Glasgow in 1797, and at an early age was placed under the care of an uncle in Paisley, from whom he received his education. While a youth, he was employed, for nearly two years, by Dr Watt, in assisting in the compilation of the Bibliotheca Britannica, and in that occupation displayed a passionate love of antiquarian lore, which characterized all his after years. His labours on the Bibliotheca were limited to that portion of the work which comprehends the books and printers of the fifteenth and sixteenth centuries—an employment highly congenial to his spirit, and which was serviceable to him in after life, when he became a collector of rare and valuable editions. After leaving Dr Watt, he obtained a situation in the sheriff clerk's office in Paisley, where he remained about ten years, during which time he attended one or two sessions at the Glasgow college. Among his earlier literary efforts were several contributions to The Visitor, a little periodical published at Greenock, and to the Harp of Renfrewshire, a collection of songs with notes, the editing of which he chiefly superintended. He afterwards employed himself busily in the compilation of an interesting collection of ballads, which he published in 1827, under the title of Minstrelsy, Ancient and Modern, illustrated by an historical introduction and notes. The ancient ballads in this collection were principally collected in the western counties of Scotland; the modern ones were chiefly his own. In 1828, he became editor of the Paisley Advertiser newspaper, and after having conducted that journal for about two years, he was offered the editorship of the Glasgow Courier, which he accepted, and continued to direct to the time of his death. While conducting the Paisley Advertiser, he, in conjunction with his friend, Mr Kennedy, author of Fitful Fancies, started the Paisley Magazine, a miscellany which displayed much talent and spirit, but which only survived for a year. His connexion with the Glasgow Courier may be considered as unfortunate for himself and the world of letters. The period during which he conducted it was one of great political commotion—the period, namely, immediately before and after the passing of the Reform Bill; and as he was a violent partisan of the high tories, he devoted all his energies against those liberal principles which were then in the ascendant. Literature was thus in a great measure abandoned for politics, and his own health suffered under the continued excitement consequent on conducting a three-times-a-week newspaper, which was considered the mouth-piece of a declining but still powerful faction. Although subject to severe fits of illness, the intimation of his death came unexpectedly upon the public of Glasgow, and he was sincerely lamented by all parties, as one who—whatever might be his political sins—had struck the ancient lyre of Scotland in a strain of tenderness that has not been surpassed. He died of apoplexy, after three hours' illness, on the 1st of November, 1835, and was buried in the Necropolis of Glasgow.

Two years before his death, he published a collected edition of his poems, which was most favourably received. Most of his pieces are distinguished either by a spirit of warlike enthusiasm or of melting tenderness—and in either strain he is equally successful. Of the former, The Sword Song of Thornstein Raudi may be adduced as an example; of the latter, his well-known Jeanie Morrison, or what is perhaps still more exquisitely pathetic, his ballad beginning, My head is like to rend, Willie.—Mr Motherwell left unfinished the greater portion of an intended prose work, embodying the old wild legends of the Norsemen.

MOTHERWORT (*leonurus cardiaca*): a labiate plant, which grows in waste places. The stem is quadrangular, rigid, and the flowers are faint purple and very hairy. The calyx is terminated by sharp points. An infusion is a popular medicine among the country people, but is much less used now than formerly. Its properties are similar to those of other *labiatæ*.

MOTION. The motion of a body is the change of its place in space. All changes in the material world consist of motion. The life of the organic creation, and the action of inorganic bodies, consists in motion: what we call *rest*, is only relative. Experience alone convinces us of the motion of bodies in space. Zeno of Elea, endeavoured to prove this fundamental idea of motion to be contradictory to itself, in order to overthrow the testimony of experience. If we see that a body changes its external relations, we conclude that it moves: its continuance in the same relations is called *rest*. By a change of the situation or relation of bodies we are often deceived, and confound *rest* with *motion*. In some cases, it is easy to perceive the error; in others, it is so difficult, that many centuries have been necessary to dispel the illusion; for instance, in relation to the earth and the sun.—In motion, we must consider the cause, the moving body, the direction, the path described, the time, the velocity, and the quantity. The mass of the moving body must be taken into consideration, since the quantity of motion depends on the quantity of matter. To move twice as much matter, requires twice as much power. The direction of the motion of a body is the line along which a moving point proceeds, either for the whole or a part of the way. If all the points of a body move in the same direction, it is only necessary to observe the motion of a single point. The line described by this point is the path of the moving body. This path itself, if in a straight line, represents the direction of the motion; if in a curved line, the direction at every point of the curve is determined by the tangent to this point; that is, this tangent shows the direction of the moving body at that point in which it would continue to proceed, if it ceased changing its direction. If all the points of a body do not move in the same direction, the motion of each point, in particular, ought to be observed; and thus we may consider every motion as the motion of a point. By the space described, we understand the distance passed through by the moving point. Since we always consider the motion of points, this space is represented by a line; and thus the observation of motion becomes geometrical. Time is necessary for motion, even for the smallest. By the comparison of the space described, and the time in which it is described, we find the velocity. One body moves quicker than another, if it describes in the same time a larger space, or the same space in a less time. By the *quantity of motion* we mean the velocity combined with the quantity of matter. To move two pounds requires twice as much power as to move one pound with the same velocity. To move a body with the velocity 2, also requires twice as much power as to move the same body with the velocity 1. Hence it follows, that to move two pounds with the velocity 3, requires six times as much power as to move one pound with the velocity 1. Motion may be considered under several different views. With regard to change of position, by which it is ascertained, it is either *absolute* or *relative*. If a body passes from one place to another, this is called *absolute motion;* it is *relative* if we consider the objects to which we refer the motion of the observed body, whether in motion or at rest, as fixed points. With regard to change of position, the motion is, further, either *common* or *proper;* finally, either *apparent* or *real*. With regard to the powers or causes which produce motion, it is either *simple* or *compound; simple*, if it is produced by a single power, or by several powers acting in the same direction; *compound*, if several motions meet, the various directions of which form angles with each other. With regard to the direction, the motion is either in a *straight* or a *curved* line; with regard to the velocity, either *uniform*, or *accelerated*, or *retarded*, and the accelerated motion again is either uniformly or variably accelerated; and the retarded motion either uniformly or variably retarded. See *Mechanics*.

MOTMOT (*prionites*.) These are beautiful birds, about the size of a jay, with a long tail, the two middle feathers of which are destitute of vanes for about an inch, at a small distance from their extremity. This conformation was supposed, by some naturalists, not to have been the production of nature, but to have arisen from a caprice of the bird in tearing away the vanes, as, in the young birds, these feathers are entire: this supposition, however, is wholly erroneous. They inhabit South America, and are very difficult to keep in a tame state, from their living on certain kinds of insects, which are not easily procured. They are very shy and timid, and if taken when old, invariably refuse all kinds of food. They are solitary, never being seen in flocks, and but seldom even in pairs. Their usual places of resort are the depths of large forests, where they may be observed among the lower branches, or on the ground. They fly very badly, and hence build their nests in the ground, using the deserted holes of some of the smaller quadrupeds. The nest consists of a few withered blades of grass, on which they deposit two eggs. The principal species are the blue-headed motmot (*P. momota*), and the red-headed (*P. dombey*).

MOTTE, ANTOINE HOUDAR DE LA, a distinguished author, was born at Paris in 1672, and studied under the care of the Jesuits. His father, a hatter, who owned a small estate at Troyes, called *la Motte*, destined him for the law; but the son had a strong inclination for the theatre, and, after having appeared in some of Molière's plays at some private theatricals, he brought out his first piece, *Les Originaux*, in 1693, with so little success, that, from chagrin, he determined to join the Trappists. The celebrated abbe Bouthillier de Rancé (q. v.), learning his resolution, dissuaded him and a companion, who meditated the same act of folly, from taking this step. La Motte returned to Paris, and began to write for the opera with more success. He brought out a great number of pieces, and was soon allowed to be inferior only to Quinault. He next ventured into the field of comedy and tragedy. Though some of his productions were unsuccessful, his tragedy *Ines de Castro* met with a most favourable reception, notwithstanding its many faults. His Odes and Fables were also much admired. Having undertaken a translation of the Iliad, without a competent knowledge of the language, he involved himself in a dispute with Madame Dacier, on account of some remarks, in his introductory essay, derogatory to the merits of the poet. His *Réflexions sur la Critique*, in reply to the violent work of Madame Dacier, *Des Causes de la Corruption du Goût*, was written in a tone of moderation: the dispute was, however, continued (by La Motte in his *Discours sur la Tragédie, sur l'Eloge, sur l'Ode, sur la Fable*, &c.) until Fénélon, who was called in as arbitrator, decided the question; and J. B. Rousseau revenged the honour of the Grecian bard, by a severe epigram on his detractor. Other paradoxical opinions (for instance, his objections to verse, although he had almost always written in verse, and with more success than in prose) involved him in numerous disputes, and drew upon him many epigrams. La Motte always kept his temper in these controversies, and, although among the most admired writers of his day, never indulged in an acrimonious tone towards his adversaries. During the last twenty-four years of his life, he was blind, and his health was very feeble; but he preserved his serenity and kindness of temper, and died in 1731.

MOTTE, COUNTESS DE LA. See *Lamotte*.

MOULDINGS. See *Architecture*.

MOULTRIE, FORT. See *Sullivan's Island*.

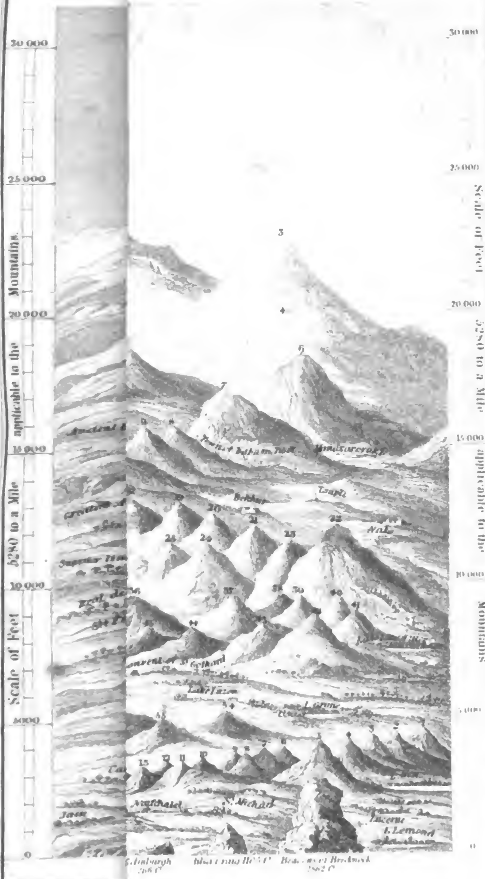
MOUND, in heraldry (from *mundus*, the world); a globe, having a cross on the top. Many heraldic eagles, as those of Austria, Russia, Prussia, have in one claw the sceptre, in the other the mound.

MOUNIER, JEAN JOSEPH, secretary of the provincial estates of Dauphiné, deputy of the third estate of this province to the states-general, a man of uncommon virtue and zeal for the general good, was born in 1758, at Grenoble, where his father was a merchant. He was educated by a severe pedantic instructer, whose obstinacy and bad humour exposed him to much suffering, and was afterwards refused admission into the military service, because he was not of noble birth, so that he early imbibed a hatred against oppression and privileged orders. Disliking the commercial profession, he devoted himself to the study of law at the university of Orange, and, after three years, became an advocate. At the age of twenty-five years, he purchased the office of a judge-royal, which he exercised for six years with much reputation. His open declaration against the abuses of the stamp and land tax, as they then existed in France, and against the mal-administration of the finances, gave one of the first impulses, in 1787, to the general opposition to these oppressive measures; and when, in the following year, the severe and imprudent proceedings of the government occasioned disturbances in Grenoble, the public voice selected him as umpire. In the first deliberations of the national assembly (of which he was a member), he was conspicuous. He was one of the principal actors in the scene of the tennis-court, July 20. Until the events of the 5th and 6th of October, he took an active part in all the proceedings of the constituent assembly, and the resolution and honesty with which he conducted in the presidency of this body, under circumstances of great difficulty, protecting the interests of the nation, and repelling the unjust attacks on the royal family, secured him the esteem of the better part of the community. But when anarchy at length prevailed, and no hope remained of restraining the fierceness of unbridled passions, he retired from public life to the Dauphiné, and thence, in November, 1789, demanded his dismission. At the same time, he published an exposition of his conduct —*Exposé de sa Conduite et des Motifs de son retour en Dauphiné*. At Geneva, to which he afterwards retired to escape the persecutions of the Jacobins, he published the *Appel au Tribunal de l'Opinion publique*—a work written with freedom and boldness, in which he described the events of October 5 and 6, and set forth the causes to which he attributed them. In 1793, he went from Switzerland to London, where government offered him the place of chief-justice in Canada, with a considerable salary, which, however, he refused, as he had not relinquished the hope of returning to his country; and Geneva, where he had till then resided, having been involved in the revolutionary disturbances, he retired to Germany, with his family, in 1795, where the duke of Weimar received him kindly, and gave him the castle of Belvedere (near Weimar), that he might establish there an institution for the education of young men from the higher ranks (chiefly young Englishmen).—Mounier here wrote his work *De l'Influence attribuée aux Philosophes, aux Francs-Maçons et aux Illuminées sur la Revolution de France*, which appeared in Tubingen, in 1801 (Paris, 1821). After the 18th Brumaire, he returned to France, was nominated, in 1802, prefect of the department Ille and Vilaine, and, in 1804, member of the conservative senate, and in the following year, was made a member of the council of state. He died January 26, 1806. His son, *Edward Claude Philip*, baron (born 1784), was auditor of the council of state under Napoleon; in 1809, became secretary of the cabinet, and, in 1810, was made *maître des requêtes*. In 1815, he entered into the chamber of deputies, and, in 1817, was made counsellor of state, and president of the commission appointed to settle the liquidations with foreign powers. In 1819, he was made peer.

MOUNTAINS; the largest elevations of the surface of the earth. Hills are distinguished from mountains by inferior height. Several mountains together, which cover a plain, are called a *group of mountains*; mountains that form a series of several miles in length, a *chain* or *ridge of mountains*. Single mountains, rising out of a plain country, are seldom met with. The cavities between the mountains are termed *valleys*. The sea-coasts are generally the lowest part of a country, which gradually rises, so that the centre of a continent is the highest, and is covered with considerable mountains. The chief mountains are connected in extensive chains all over the surface of the globe. The Ural mountains, which separate Asia from Europe, and send forth a branch towards Nova Zembla, are connected with the Severnoi or Sevous ridge, that forms the boundary between Norway and Sweden, and a part of Russia. Another chain stretches from the northern part of India to Thibet and Cashmere, where it forms the highest region, not only of Central Asia, but of the known world, running westward through Persia, and eastward through China. From the highest elevation of Northern Asia, the Bogdo mountains, which separate the seats of the Calmucks from those of the Mongols, a chain of mountains under the name of *Mossurt* runs southward to Thibet: another, under the name of *Alak*, extends towards the west through the deserts of Independent Tartary and Bucharia, and joins the Ural mountains: a third, under the name of *Zangai*, in Mongolia, stretches eastward, then, turning, forms Corea and the cliffs and islands toward Japan: a fourth chain consists of the Alta mountains, which border on Siberia, from the Irtish to the Amour. The branches of these great Asiatic chains are innumerable. Between the Caspian and Black seas, the Caucasus (q. v.) is situated. It sends off branches through Asia Minor as far as Arabia, which form the ridges of Taurus, Lebanon, and Sinai, while others pass round the Black sea to Europe. From the Black sea, between Moldavia, Walachia, and Transylvania, the Carpathians extend through Poland and Hungary, and, in Silesia, join the mountainous regions of Germany. The Sudetes run between Bohemia and Silesia, sending forth branches to the north and west, through Lusatia to the Saxon Erzgebirge, and Voigtland. The Fichtelgebirge and the Thuringerwald, or Forest of Thuringia, together with the Eichsfeld and the northern Hartzgebirge, extend through the centre of Germany. The most elevated countries of Europe are Switzerland and Savoy, whose Alps are connected with the neighbouring chains of Germany, Italy, and France. A branch, united with them, the Apennines, running through all Italy as far as Reggio, is probably connected, by a submarine chain, with the mountains of Africa. The Rhætian Alps stretch between the Grisons and Milan; the Tridentine between the Tyrol and the territories of Venice; the Norican between the Tyrol and Salzburg; and those of Carinthia between Carinthia, Carniola, Friuli, and Istria. On the west, some branches of the Alps extend into France. The Pyrenees form the frontier wall and the principal elevation of the Spanish peninsula. In Africa, the chain called *Atlas* is the most famous. There is a distinction made between the Great and Little Atlas. The former, which is, perhaps, connected with the mountain chains of Arabia, runs westwardly to Barbary, separating it from Biledulgerid; the latter reaches from Tunis to Gibraltar. In addition to these, some less celebrated chains extend along the Nile, through Upper Egypt, Nubia, and Abyssinia, to unknown regions in the interior of Africa, where they are connected with the Mountains of the Moon. Thence some ridges stretch to the south of Africa, and join, perhaps, the Snow mountains, which take their course from the cape of Good Hope towards the interior. Next to Asia, America contains the highest mountains. With the Cordilleras (q. v.), along the western coast of Chile and Peru, other chains of mountains are connected, running through the rest of South

America. One ridge extends through the isthmus of Darien to North America, where it runs northward along the western coast, sending off different branches eastward into the interior, which, in all probability, join the mountain ridges of Northern Asia, in the extreme north. The highest known summits are of the Himalaya in Thibet (particularly the Dholagir, or White mountain), which has been made, by one measurement, 26,872 feet, by another 28,015 feet high. The perpendicular height above the level of the sea, of a peak belonging to the Mustag mountains, in Central Asia, measured by the English colonel Crawfurd, is about 26,500 feet; that of Chimborazo, according to Humboldt, 21,440; that of Mauna Kaah, on the Sandwich islands, 18,400; of Cayambourco, 20,000; of Antisana, 19,150; of Pinchinca, 15,940 (all three near Quito); of the farm-house of Antisana, the highest place inhabited by men, 13,434; of the city of Quito, 9560; of Mont Blanc, 15,680; of Ophyr, in Sumatra, 13,842; of Loucira, in the French department of the Upper Alps, 14,450; of Aiguille de l'Argentiere, 12,804; of St Gothard, 9075; of Ætna, 10,936; of Furca, 14,040; of the Brocken, 3716; of the valley of Chamouni, 3463; passage of Mont Cenis, 6773; of the city of Geneva, 1220. The heights of these mountains are inconsiderable in proportion to the great mass of the earth, the spherical form of which is not essentially altered by them; for the height of Chimborazo is not, to the diameter of the earth, in the proportion of 1 to 1000. The form of mountains is generally conical, that is, gradually tapering from the base upward, and terminating in a more or less pointed peak. The Alps, in Switzerland and Savoy, consist of an enormous collection of different mountains, disposed in several parallel chains. The highest of these chains is in the middle; those which rest on them diminish in height in proportion as they recede from the main branch. The highest ridge consists of steep rocks, which, with the exception of the declivities, are everywhere covered with ice and snow. Between the masses of rocks, that crown the highest chain, in pyramidal forms, are valleys, in which the snow, and ice proceeding from the half-melted snow, never thaws, even in summer, because of their high situation. Lower down, on both sides of the main branch, long wide valleys descend, which in summer are decked with a beautiful green, and, where their situation is not too high, are partly planted with corn and fruit-trees, partly used for pasturage. To these green vales deep and narrow passages descend from the high rocky valleys. These passages are filled with everlasting ice, and bear the name of *glaciers* (q. v.). Those chains of mountains which border on the main chain, present the same appearances, only on a smaller scale; for their tops likewise consist of pointed rocks, separated by such deep and narrow passages, which, even in summer, are covered with ice and snow, and to which succeed verdant valleys. The farther the chains recede from the main chain, the more do they diminish in height. Every thing bears a milder aspect. The tops of the single mountains are more rounded; the mountains themselves are decked with a beautiful green, and, by degrees, lose themselves in the plains. Countries covered with high mountains present, in the summer, different climates at different elevations, within a very narrow compass. We may ascend gradually from flourishing and delightful valleys, decorated with corn, fruit-trees, and vines, to pastures covered with odoriferous Alpine plants, and, near the declivities, with evergreens, and perceive the vegetation diminishing and dwindling as we advance, till, at last, all organic life ceases, and the cold prevents all further progress. The elevation of this region of perpetual winter is different in different latitudes; it is higher in warm countries, and lower in cold climates. That the air is colder on the mountains than it is in the plains, is evident from what has been said. This is to be attributed partly to the reflection of the sun's rays from the surface of the earth in plains, and its consequent accumulation in the lower strata of the atmosphere, but partly also to the greater density of the air, which is susceptible of being warmed in a higher degree than the thinner air of the mountains. That the air on the mountains is purer is certainly true; but that it is healthier also, can be admitted only in regard to a moderate height. At a great height, an indescribable oppression, combined with great weakness, seizes upon the whole body—a phenomenon which Saussure attributes to the diminished pressure of the air upon the vessels, and their consequent loss of elasticity. The interior of mountains is known only so far as it has been laid open to the miner in working mines.—See Denaix's *Tableau orographique de l'Europe* (Paris, 1826, 2 vols.); see also the articles *Alps*, *Andes*, *Cordilleras*, *Himalaya*, &c. For a comparative view of the principal elevations in the Eastern and Western hemispheres, with their heights in English feet, as ascertained by the best authorities, see Plate LXXIII.

MOURADGEA D'OHSSON, IGNATIUS, born in Constantinople, was descended from a rich Armenian family. He entered into the service of the Swedish embassy, at the Ottoman Porte, and by his talents attained the highest diplomatic honours. He was made *chargé d'affaires*, knight of the order of Vasa, and, in 1782, minister plenipotentiary and envoy extraordinary. His knowledge of the Arabic and Turkish languages gave him the means of acquiring information respecting the Ottoman empire from the very sources. He resolved upon writing a history of Selim II.; but this was superseded by his plan of giving a full picture of the Ottoman empire. To this work he devoted himself with the greatest zeal and perseverance, and with great difficulty succeeded in collecting the first authentic information from a prejudiced, servile, and jealous people, respecting the national customs and habits, the interior of the seraglios, the mosques, and the private life of a Turk. With the materials which he had obtained, he proceeded to Paris in 1784, where he prepared his work for the press, and published it, in 1788 and 1789, in two volumes, under the title of *Tableau général de l'Empire Ottoman*. This work completely answered the expectations which had been formed respecting it. The beauty of the typography and the engravings occasioned an expense which exceeded the proceeds of the sale; but D'Ohsson, who possessed a large fortune, was willing to make sacrifices for the embellishment and perfection of his work. The revolution interrupted his literary activity, and he returned to Constantinople. Selim III., who honoured knowledge, allowed the two volumes which were published to be presented to him, and, far from being displeased at the disclosure of some secrets, gave orders to facilitate the learned writer's researches, by affording him the necessary information. After a long sojourn in Constantinople, D'Ohsson returned to Paris, where he found hardly any traces of his large property. Even the buildings where he had deposited the copies of his work, and the plates, drawings, &c., had been destroyed and plundered. Without suffering himself to be depressed by these misfortunes, he devised a still greater plan, which had in view an historical picture of the whole East, and became entirely absorbed in his desire to execute it. In 1804, he had completed two volumes of his *Tableau historique de l'Orient*, when the war with Sweden made him apprehensive of another interruption. He asked and



1	Sorata Andes	
2	Illimani D°	
3	Gualatieri D°	
4	Chimborazo	
5	Cayambe D°	
6	Antisana D°	
7	Cotopaxi D°	
8	Tolima D°	
9	Mount S^t Elias	
10	Popocatepetl	
11	Pinchincha An	
12	Mount Fairweather North America	
13	Cofre De Perote	
14	James's Peak Rocky Mountains	
15	Sierra de Cob	
28	Mount Stella Germany	11 [illegible]
29	Highest Peak of the Great S^t Bernard	11 [illegible]
30	Simplon Alps	11 [illegible]
31	Mount Etna Sicily	10 [illegible]
32	Peak of the Cascades Pyrenees	10 [illegible]
33	Glaserhorn Switzerland	10 [illegible]
34	Town of Mauberre Pyrenees	9 [illegible]
35	Ruska Poyana Hungary	9 [illegible]
36	Awatscha Pik Kamtschatka	9 [illegible]
37	Lebanon Palestine supposed	9 [illegible]
38	Little S^t Bernard Alps	9 [illegible]
39	Monte Cerme Apennines	9 [illegible]
40	The Grimsel Switzerland	9 [illegible]
41	Argentaro Sardinia	[illegible]
42	Mount Sinai Arabia	8 [illegible]
43	Great Lomnitzer Hungary	8 [illegible]
44	Roc Blanc French Pyrenees	8 [illegible]
45	Sneehatta Norwegian Alps	8 [illegible]
46	Monte Velino Naples	8 [illegible]
47	Hornet Horn Salzburg Alps	8 [illegible]
48	Mount Ida Candia Isle	7 [illegible]
49	Volcano Mount Bourbon Isle	7 [illegible]
50	Mount Athos Macedonia	6 [illegible]
51	Mount Olympus Turkey	6 [illegible]
52	Parnassus Greece	5 [illegible]
53	Ossa Turkey	5 [illegible]
54	Pelion Greece	5 [illegible]
55	Hecla Iceland	5 [illegible]
56	Vesuvius Naples	3 [illegible]
57	Table Mount Cape of Good Hope	3 [illegible]

ceived permission from his government to retire to the country. Here he continued to occupy himself on his undertaking during three years, and gave the fruit of forty-five years' labour to the world, in a work which contains, in three separate divisions, a complete view of the Ottoman empire. These three divisions have the separate titles, *Tableau historique de l'Orient* (a history of all the nations under the Ottoman government); *Tableau général de l'Empire Ottoman* (a view of the laws, religion, and customs, &c.); lastly, *L'Histoire de la Maison Ottomane* (from Osman I. till 1758). The whole was nearly completed when interrupted by D'Ohsson's death, August 27, 1807. The last volume of this work, which comprises in the whole seven volumes, appeared in Paris, 1824.

MOURNING. In most nations it is the custom of bereaved survivors to testify their grief for the loss of friends or relatives by some external change of dress and deportment. Different nations have employed the same emblems as symbols of the most opposite states of the mind, being governed altogether by their previous habits and associations, so that the signs of mourning are very various. Thus some wear the hair long, others cut it off; some shave the beard, others allow it to grow. The Eastern nations and the Greeks cut off their hair; the Romans allowed the beard and hair to grow, in mourning. Different colours have been adopted as badges of grief; the ancient Egyptians wore yellow; the Ethiopians gray; the Roman and Spartan women white, which is still the colour of grief in China and Siam; in Turkey, blue and violet; and in the other European countries, black are used for this purpose. Some have attempted to trace the associations by which the colours acquired their character to natural causes, but, it must be allowed, with little success. The Jews, in sign of grief at the loss of their relatives, rent their garments, tore out their hair, and wore coarse garments of a dark colour; they went barefoot, neglected their persons, and performed other acts of penance. The term of mourning with them was short. Among the Greeks and Romans, it was the custom to lay aside all ornaments of dress, to abstain from the bath, and other indulgences. The dress was also of a dark colour (except with the women), and the period of mourning was about a year. Among the ancients, as among the moderns, public mournings were common on the death of a distinguished public benefactor, and in the time of the Roman empire, on the death of the emperors.

MOURZOUK; the capital of Fezzan, in the kingdom of Tripoli; lat. 25° 54′ N.; lon. 15° 51′ E. It is the residence of the sultan of Fezzan, and is surrounded by walls twenty feet high and eight feet thick. The houses are of mud, and as rain is rare, are durable. Mourzouk is one of the greatest commercial places in Africa, forming the centre of communication between the central, northern, and eastern regions of that continent. Caravans arrive yearly from Egypt, Tripoli, Bournou, and Houssa.

MOUSE (*mus*). This genus includes not only what are usually termed *mice*, but also the *rats*; and under the common name of *mice* are also understood several species of *arvicola*, &c. The common mouse is not a native of the United States, but was brought there by the early settlers, and has now extended, with the increase of population, to every part of the continent. There are several varieties, distinguished by their colour, the rarest of which is the white. The mouse makes a nest not unlike that of a bird, and brings forth several times in a year, generally having from six to ten at each litter. When first born, mice are naked and helpless, but in about fifteen days are able to shift for themselves. The mouse is capable of being tamed, and exhibits considerable attachment to its keeper. As, from their numbers and depredations, they are extremely troublesome, several modes have been devised to destroy them; as cats, traps, poison, &c.—The American field mouse (*M. leucopus*) is very common in all parts of the United States, and is the representative of the European species (*M. sylvaticus*). They are very injurious to the farmer, from destroying great quantities of grain, which they hoard up; in a few nights they will almost ruin a field of newly planted Indian corn. This mouse is about three inches long, and has a streak of a mixed dusky and ferruginous colour along the back; the tail is dusky above and white beneath.—The meadow mouse does not belong to the genus *mus*, but is an *arvicola*. This diminutive animal occurs in vast numbers, living in burrows made in the banks of drains or streams. During the warm weather, however, they make nests among the grass, very similar to birds' nests, and generally containing six or eight young ones. In almost all grass fields when they are mown, small lanes or furrows may be seen among the roots of the herbage; these are the various communications made by the field mouse with its nest. Notwithstanding they are preyed upon by owls, hawks, &c., they multiply excessively, and sometimes commit great ravages in the grass fields.

MOUSQUETAIRES DU ROI (under the old French *régime*); mounted companies of royal guards, splendidly equipped, and composed of gentlemen of noble extraction. One of the companies was called the *mousquetaires gris*, from the colour of their horses being dapple-gray; the other the *mousquetaires noirs*, in which the horses were black. Their arms were a carbine, sword, and pistols. They were instituted by Louis XIII., and served as a school to many of the most distinguished French commanders.

MOUTH; in most animals, a cavity in the anterior part of the body, but very differently formed in different sorts of animals. It commonly serves for the reception of food, and is connected by a canal with the interior parts of the body, where the food is assimilated. In the higher orders, it is used for mastication, the emission of sound, deglutition, respiration, suction, and taste, being connected with organs which perform those processes. The lower jaw only is movable in this division. Some of the lower orders seem to be without a mouth, and to nourish themselves by absorption. In birds, the external parts of the mouth are a hard, bony substance, and it is not fitted for suction. In insects, the form of the mouth is very various.

MOVING PLANT (*hedysarum gyrans*). This plant is remarkable for the spontaneous motion of its leaves, which does not appear to depend on any external cause that we can determine. No sooner has the plant acquired its ternate leaves, than they begin to revolve this way and that; and this motion continues during the whole course of its vegetation. The whole plant is very seldom in motion at one time; one leaflet turns frequently, while the other, on the same leaf-stalk, is at rest; sometimes a few leaflets only move, at others, nearly all will be in motion. These movements are irregular both in time and in their direction, and occasionally, in a very hot day, the plant is entirely at rest. A high wind will often put a stop to these movements, but they continue both in the night and during rain. We are unable to excite them by touch, irritation, or any other art that we know of. The plant is a native of the Basin of the Ganges, and is by no means conspicuous in its appearance. It belongs to the *leguminosæ*, and has a jointed pod, purple flowers, and ternate leaves, the lateral leaflets of which are comparatively very small.

MOXA; a Chinese word adopted into the European languages, signifying a lanuginous or cottony substance, which is burned for the purpose of cauterizing the skin. The Chinese and Japanese prepare their moxa from the down of the mugwort (*artemisia Chinensis*).

MOZAMBIQUE. See *Mosambique*.

MOZART, John Chrysostomus Wolfgang Amadeus; the great German composer, born at Salzburg, 1756. At the age of four years, his father commenced teaching him some minuets and other small pieces on the harpsichord. He only needed half an hour to play a minuet with perfect correctness and ease. From this period, he made rapid progress, and, in his fifth year, composed little pieces, which he played to his father, who wrote them down. He had previously been so much delighted with all infantile games, that he would forget his meals for the sake of playing; but from the time when he commenced learning music, he lost all taste for the usual amusements of childhood. Although he applied himself with energy and activity to all subjects in which he received instruction, music was the occupation which seemed completely to fill his soul. He advanced so rapidly as to surprise even his father, who was constantly with him. A concert for the harpsichord, which he wrote in his fifth year, perfectly according to the rules of the art, was so difficult that only the most practised performer could have played it. In his sixth year, Mozart had already made such progress, that his father was induced to take him and his sister Maria Anna, who was also a musical genius, to Munich and Vienna, where the little artists were introduced at the emperor's court. The unequalled execution of young Mozart excited universal surprise, and the interest was heightened by the fact that he was anxious only to please real connoisseurs, and appeared little affected by the opinion of the multitude. Thus he requested the emperor Francis to send for Wagenseil; this was done, and the child then performed one of his concerts with surprising execution. Till this period, he had only devoted himself to the harpsichord. In Vienna, he had a little violin given him; and when the family returned to Salzburg, he had made such progress on this instrument, without the knowledge of his father, that, to the surprise of all the auditors, he performed the second violin in a trio, with the greatest precision. It was now evident that the whole soul of young Mozart was devoted to music; his mind was absorbed in it. Singular stories are told of his sensibility to the finest differences of tones. Even at this early period, he had the greatest aversion to discords and rough, shrill tones, not softened by combination; as, for instance, the sound of the trumpet, which, on one occasion, so affected him, that he fell to the ground, pale, lifeless, and convulsed. This delicate sensibility is apparent in all the works of Mozart. In 1763, when young Mozart was seven years old, the family made a journey beyond the borders of Germany, which spread his fame universally. In November of the same year, they arrived in Paris, where they remained six months, and were overwhelmed with attention and applause. Here young Mozart published his first sonatas for the harpsichord. In 1764, the family proceeded to England, and performed at court, the son playing on the king's organ with great success. At a public concert, symphonies of his composition only were performed. Here, as well as in Paris, compositions of Bach, Handel, &c., were laid before him, all of which, though exceedingly difficult, he executed with the greatest truth at first sight. During his stay in England, he composed six sonatas, which were published in London, and which he dedicated to the queen. In 1765, the family went, by way of the Netherlands, to Holland, where Mozart repeatedly performed on the organ in the cathedrals and monasteries. In the Hague, he fell dangerously sick. On his recovery, he published six sonatas, and dedicated them to the princess of Nassau. At the beginning of the year 1766, he was again four weeks in Amsterdam, and proceeded thence to the Hague, to assist at the installation of the stadtholder. The family next visited Paris, and after having been twice at Versailles, proceeded, by way of Lyons, through Switzerland to Munich, where the elector gave young Mozart a theme, on which he composed in his presence without piano or violin, wrote down the music, and, to the astonishment of all present, executed after having finished it. In 1766, they returned to Salzburg, where they remained till 1768, and then made a second journey to Vienna. The brother and sister performed in presence of the emperor Joseph, who commissioned young Mozart to write the music for a comic opera—*La Finta Semplice*. It was applauded by Hasse, the master of the chapel, and Metastasio, but was not performed. At the consecration of the orphan's church, he composed the mass, the *offertorium*, and a concert for trumpets, and led the solemn performance—a boy of twelve years old—in presence of the imperial court. In 1769, Mozart, who had been made master of the concerts at the court orchestra at Salzburg, commenced a journey to Italy, in company with his father. In Rome, he undertook to write down, on hearing it, the famous *Miserere*, annually sung in the Sistine chapel, during the holy week, and at that time kept very secret. He succeeded so well, that when he sang it in company to the harpsichord, Christofori, who had sung it in the chapel, expressed his wonder. In Naples, the scholars of the *conservatorio della pietà* supposed that the magic of his musical talent was in the ring which he wore; he took it off, and then their astonishment increased. In Rome, the pope made him a knight of the golden spur; in Bologna, after having composed, in half an hour, an antiphony for four voices in a room in which he was shut up alone, he was elected member and master of the chapel of the philharmonic academy. As he had engaged to compose the first opera for the carnival at Milan, he was compelled to refuse similar offers from Bologna, Naples, and Rome. He arrived at Milan at the end of Oct., 1770, and there composed, in his fourteenth year, the first opera, Mithridates, which was performed Dec. 26, and repeated more than twenty times in succession. In Verona, he also received a diploma as member of the philharmonic society. Thus honoured, he quitted Italy, where he was called *il cavaliere filarmonico*. When Mozart returned to Salzburg, in 1771, he found a letter, in which he was commissioned, in the name of the empress Maria Theresa, to compose the grand theatrical serenata *Ascanio in Alba*, for the celebration of the nuptials of the archduke Ferdinand. He undertook this commission, and, in August, returned to Milan for some months, where, during the festivities of the marriage, Mozart's serenata, and an opera composed by Hasse, were both performed alternately. In 1772, he composed, in celebration of the election of the archbishop of Salzburg, the serenata *Il Sogno di Scipione*. In the winter of 1773, he composed there his opera *Lucio Silla*, which was repeated twenty-six times in succession. After having completed a comic opera, called *La Finta Giardiniera* (1775); two grand masses; one serenata called *Il re Pastore*; and, in Paris, to which he had been invited a second time, a grand symphony for the *concert spirituel*, in that city, he went to Vienna, in his twenty-fourth year, where he engaged in the service of the emperor. He satisfied the great expectations which were raised by his early genius, and was the Raphael of musicians. But early as this great genius developed his powers in his own art, he remained a child in all the other relations of life. He never knew how to govern himself; he had no sense of the necessity of domestic order, of the value of money, and of the need of moderation in enjoyment. But this absent, distracted man seemed to become of a higher order when seated at the harpsichord. His mind expanded, and his attention was absorbed in the one object for which he was born —the harmony of sound. He preferred to play in the night till early in the morning, if he was not prevented. He usually composed from six or seven in the morning till ten, and almost always in bed; during the rest of the day, he would compose no more, unless he had something to finish. Besides music, there was but one thing to which he appeared devoted —billiards. His exterior was not favourable; he was short, pale, and thin, and his features were not striking. Among the works of his which have remained on the German stages, and which will always be the delight of the German nation, is his *Idomeneo, Re di Creta*, composed 1780, at Munich. Of his *Entführung aus dem Serail* (his fourteenth opera in the order of time), which was performed at Vienna, in 1782, Joseph II. said to the composer, "This music is too fine for our ears; there are a prodigious number of notes in it." "There are as many as are proper," replied Mozart. The Marriage of Figaro met with the highest applause. It was performed during the winter of 1787, at Prague. At the same place, Mozart composed, in the same winter, his Don Juan, which pleased in Prague even more than the Marriage of Figaro. Nevertheless, this opera, on its first representation, was not favourably received at Vienna, although Haydn, on this occasion, pronounced Mozart the greatest of all living composers. After having written, in 1790, *Cosi fan Tutte*, and, during the illness which caused his death, 1791, the *Magic Flute; La Clemenza di Tito*, and his famous requiem, he died, December 5, 1792, in the thirty-sixth year of his age, according to the opinion of the physician, from an accumulation of water on the brain. His instrumental compositions (his beautiful symphonies, his ethereal quartetts, concertos for the piano, sonatas, &c.) will remain a pattern for all nations and all ages. He has equal fame in sacred music, particularly for his grand hymns and masses. His requiem is generally said to have had the following origin. A count of Walseeg, who was a stranger to him, came one day, and requested him to compose a mass for the death of his wife, for which Mozart was to fix his own price. Mozart required 100, others say 200, ducats, but would not bind himself as to time, wishing to give the work perfection. The visiter paid the price demanded in advance, and promised, when the work was finished, to give an additional sum, and to call again in the course of some months. During this time, Mozart received the commission to compose *La Clemenza di Tito* for the coronation at Prague, and was on the point of entering the carriage to proceed to Prague, when the visiter reappeared, and reminded him of his promise. Mozart apologized, and promised to attend to the work immediately on his return from Prague. He commenced the mass with an energy and interest which he had never yet felt while composing any of his other pieces, so that his wife felt great anxiety lest the unusual exertion should affect his already declining health; indeed, Mozart himself, with tears in his eyes, acknowledged that he was writing a requiem for himself. His wife prevented him from continuing the work, and would not return him the manuscript till his health was apparently perfectly re-established, and he had repeatedly requested it. Mozart nearly completed the work, when he was again oppressed with melancholy; his health daily declined, and his death took place. Immediately on his death, the visiter appeared, demanded the piece, and received it unfinished, as it was left. This composition fell into the hands of his scholar Suszmayr, who presumed to make additions and alterations, particularly adding those instruments to the sanctus which were omitted, and arranged the whole as it is now printed. Mozart's works equally delight the mere amateur and the accomplished musician, notwithstanding the complete novelty of their character. He explored all the sources of the art, and attained the highest degree of perfection, by the richness, purity, and depth of his ideas. Mozart left a widow and two sons. The former married a second time, and died in 1826. His eldest son received a post in one of the government offices at Milan: the younger son, born 1792, became a performer, and composer on the piano-forte.

MUCIC ACID. This acid has generally been known by the name of *saccholactic* acid, because it was first obtained from sugar of milk; but all the gums appear equally to afford it. To obtain it from a gum, we have only to heat one part of this substance with two of nitric acid, till a small quantity of nitrous gas and of carbonic acid is disengaged, when the dissolved mass will deposit, on cooling, the mucic acid. The pulverulent acid is soluble in about sixty parts of hot water. It decomposes the muriate of lime. It scarcely acts upon the metals, but forms salts with their oxides. According to Berzelius, mucic acid consists of oxygen, 62·69, carbon, 33·69, and hydrogen, 3·62.

MUCIUS SCÆVOLA (properly *Caius Mucius Cordus*); the subject of a celebrated Roman tale. If we may believe the story, when Porsenna, king of Etruria, had besieged Rome to reinstate Tarquin in his rights, Mucius determined to deliver his country from so dangerous an enemy. He disguised himself in the habit of a Tuscan, and, as he could speak their language fluently, he gained an easy introduction into the camp, and, soon, into the royal tent. Porsenna sat alone with his secretary when Mucius entered. The Roman immediately rushed upon the secretary, and stabbed him to the heart, mistaking him for his royal master. Mucius, unable to escape, was seized. He gave no answers to the inquiries of the courtiers, and only told them that he was a Roman, and, to give them a proof of his fortitude, he laid his right hand on an altar of burning coals, sternly looking at the king, and, without uttering a groan, boldly told him that 300 young Romans like himself had conspired against his life, and determined either to destroy him, or to perish in the attempt. This extraordinary confession astonished Porsenna, who made peace with the Romans, and retired from their city. Mucius obtained the surname of *Scævola* (the Lefthanded), because he lost the use of his right hand by burning it in the presence of the Etrurian king.

MUCK. See *Amuck*.

MUCUS (from *μυξα*, the mucus of the nose): one of the primary fluids of the animal body, perfectly distinct from gelatin and vegetable mucus; transparent, glutinous, thready, and of a salt savour. It contains water, muriate of potassa, and soda, lactate of lime, of soda, and phosphate of lime. The mucus forms a layer of greater or less thickness, at the surface of the mucous membranes, protects these membranes against the action of the air, of the aliment, the different glandular fluids, &c. Independently of this general use, it has others that vary according to the parts of mucous membranes: thus the mucus of the nose is favourable to smell, that of the mouth to the taste; that of the stomach and the intestines assists in the digestion. A great part of the mucus is absorbed again by the membranes which secrete it: another part is carried outwards, either alone (as in blowing the nose or spitting), or mixed with the pulmonary transpiration, or with excremental matter, &c.

MUEZZIN, or MUEDDIN, in Mohammedan countries; the crier who announces the hours of prayer from the minaret. Five prayers are repeated daily,—one before sunrise, one at dawn, one at noon, one at four in the afternoon, and one at sunset. As bells are not in use among the Mohammedans, the muezzin proclaims the time, and reminds the faithful of their duty. He tells them at daybreak that prayer is better than sleep, and, at dinner-time, that prayer is better than food.

MUFTI. Grand mufti (called, also, by the Turks, *sheik-Ulislam*, which means head of the elected) is, in Turkey, the chief minister of religion and law, and follows in rank immediately after the grand visier. In fact, he receives from the sultan honours even beyond those of the visiers. His election depends entirely upon the sultan, and, as long as he remains in his office, he cannot be condemned to death. The sultan can only depose him, and cannot confiscate his property. The mufti, as interpreter of the Koran, is consulted on judicial proceedings, particularly in criminal cases, and, in general, on all affairs of importance. He usually gives his opinion in few words, without adding the reasons. In difficult cases, he adds, "God knows what is best." In his signature, he calls himself the *poor servant of God*. His written sentence is called *fetvah;* and hence the mufti himself is called *sahibi-fetive*, which means master of legal decisions, and his secretary is called *fetvah-emini*. The latter remains by him, decides cases with which the mufti does not wish to trouble himself, and presents the decision for his signature. The fixed revenue of the mufti amounts to 2000 aspers daily. (See *Asper*.) As he has, moreover, the disposal of several places in the imperial mosques, and is concerned in all the promotions of the members of the legal profession, he has many additional sources of income. In great cities, there is an under mufti, who receives his place from the grand mufti, but not without making him valuable presents.

MUGGENDORF; a village in the Bavarian circle of the Upper Maine, in a valley on the Wiesent, remarkable for the numerous caves in the environs. Some of them contain stalactites, and others great quantities of bones of unknown animals.

MUGGLETONIANS; a religious sect which sprang up in England, in the middle of the seventeenth century, so called from their founder, Muggleton, a tailor. He and an associate pretended to the character of prophets, and to be the two witnesses mentioned in Revelation.

MUHAMMED. See *Mohammed*.

MUHLBERG; a city of the Prussian territories, in the province of Saxony, celebrated in history for the battle between the Protestants, under John Frederic, elector of Saxony, and the Catholics, under the emperor Charles V. (q. v.), April 24, 1547. See *Germany; Smalcaldic League*.

MUKANNA, Atan Hakem (called also *Mokanna*, or *Borkai*), born in Khorasan, 775, pretended that the spirit of God, which had been transmitted from Adam, through Noah and all prophets, rested on him. Being hard pushed by the caliph Mohammed I., he burned himself, with all his treasures, in Sam. His followers were called *Moveidites*, and paid him [illegible] honours.

MULATTO (Spanish, *mixed*) is commonly used to signify the offspring of a black and a white. The mulatto is of a yellow colour, with frizzled or woolly hair, and resembles the European more than the African. The descendants of Europeans and Indians are called *mestizos* (q. v.). In Spain, the term *mulatto* is often applied to those persons in whom the Moorish blood has been mingled with the Spanish.

MULBERRY (*morus*); a genus of plants allied to the nettle, and belonging to the natural family *urticeæ*. The species are trees, bearing alternate, simple, and often lobed leaves, and inconspicuous flowers, which are disposed in aments. The fruit is edible. The white mulberry (*M. alba*) is the most interesting of the genus, on account of the leaves being used for food by silk-worms. It grows to the height of forty or fifty feet, with a trunk two or more feet in diameter. The leaves are often divided into several lobes. The berries are white, sometimes, however, varying to red, and possess a sweet and insipid taste. It is a native of China, and the Chinese claim the art of rearing silk-worms, and manufacturing stuffs, from a very remote period. From China, this art was introduced into India and Persia, and was practised there for many ages before it reached Europe. The Greeks became acquainted with silk subsequent to the time of Alexander; and it was not till the end of the republic that the Romans, for the first time, saw this precious article. For many ages, silk bore an enormous price at Rome; but about the middle of the sixth century, during the reign of Justinian, two monks arrived at Constantinople from India, bringing with them the white mulberry, and the eggs of the silk-worm. From Constantinople, the white mulberry was introduced into Greece, and, about the year 1130, into Sicily and Italy. The first mulberry that was planted in France was living in 1802, and there still remain some stocks that are apparently of nearly the same age. It is now cultivated and naturalized throughout the south of Europe, and in some of the central parts of that continent. In southern climates, the leaves appear to contain a less proportion of water, and more of that substance which causes the worms to produce silk in greater abundance, and of a finer quality. In Greece, Asia Minor, and Persia, it is usual to give to the worms the branches, with the leaves attached to them; but, in Spain, Italy, and France, the leaves are carefully stript from the trees, taking care to despoil each tree entirely, otherwise the sap will be unequally attracted. The varieties of this tree are very numerous. The most approved mode of cultivation is from seed, and is practised exclusively in the south of France. A moderately fertile soil is the most suitable.

The black mulberry (*M. nigra*) is a tree about as large as the preceding, said to be a native of Persia, but which has been cultivated in Europe from a very remote period. The fruit is blackish purple, sugary, with a slight acidity, and very agreeable. It is, however, in perfection only for a few moments, and that at the time when it can be detached from the tree by a slight shaking of the branches. The Romans, indeed, preferred it to every foreign fruit. This tree often yields a prodigious quantity. The leaves are sometimes substituted for those of the white mulberry for silk-worms.

The red mulberry (*M. rubra*) is one of the most valuable of American trees, from the properties of the wood. The leaves are large, cordate, entire, or divided into two or three lobes, rough and hairy while young. The fruit is deep red, and of an agreeable sugary flavour, mingled with a slight acidity. It is rather rare in the Atlantic states, but is abundant in the west, on the Ohio and its tributaries, and on the lower parts of the Missouri. It grows to the height of sixty feet and upwards, with a trunk six feet in circumference. The wood is fine-grained, compact, strong, and solid, and, by many persons, is esteemed fully equal to the locust. It is employed in naval architecture at Philadelphia and Baltimore, for the upper and lower parts of the frame, for knees and floor-timbers, and for treenails, it is hardly inferior to the locust, but is scarce in our ship-yards, and difficult to be procured in any quantity. For posts it is considered nearly as lasting as the locust, but it grows more slowly, and requires a richer soil. These qualities of the wood have induced Michaux to recommend its introduction into the European forests. Some experiments have been instituted in France, to ascertain whether the leaves were proper for silk-worms; but the result was unfavourable. A much less quantity was obtained than from worms fed on the white mulberry, and there was a greater mortality: the worms, however, did not seem to be aware of the change, even when the leaves were mixed.

The paper mulberry has now been separated from the genus *morus*, and placed under an allied one,—*broussonetia*. It differs from the true mulberries in having the female flowers collected into a globular mass, which acquires a bright red colour. The tree is of a moderate size, bearing leaves which are either simple, or divided into lobes, more or less deep, rough above and hairy beneath. It was originally from India and Japan, but is now very commonly cultivated in Europe, and succeeds even in the more northern parts. For a long time, the female plant was unknown in Europe, and, at the present time, it is exceedingly rare in this country. The islanders of the Pacific make a kind of clothing from the bark of this tree, in the following manner: Twigs of about an inch in diameter are cut, and deprived of their bark, which is divided into strips, and left to macerate for some time in running water: after the epidermis has been scraped off, and while yet moist, the strips are laid out upon a plank, in such a manner that they touch at the edges, and two or three layers of the same are then placed upon them, taking care to preserve an equal thickness throughout. At the end of twenty-four hours, the whole mass is adherent, when it is removed to a large, flat, and perfectly smooth table, and is beaten with little wooden clubs, till it has attained the requisite thinness. This kind of cloth is easily torn, and requires to be washed and beaten many times before it acquires its full suppleness and whiteness. The natives dye it red and yellow, and also make a similar cloth from the bread-fruit-tree, an allied plant; but that from the mulberry is preferred. The paper which is used in Japan, and many other countries in the East Indies, is made from this plant. For this purpose, the annual shoots are cut, after the fall of the leaves, tied in bundles, and boiled in water mixed with ashes; after which the bark is stripped off by longitudinal incisions, and deprived of the brown epidermis. The bark of the more tender shoots is separated from the rest, as it furnishes a very white paper for writing, while that produced by the remainder is coarse and gray, and serves for wrapping, or similar purposes. The writing-paper is not suitable for quills, and these nations employ hair pencils, or the feathers of birds. For printing, they make use of wooden blocks; and this, as well as the writing, can only be executed on one side. Silk-worms will eat the leaves of this tree indiscriminately, even when mixed with those of the white mulberry. The fustic tree is now referred to the genus *broussonetia*. See *Fustic*.

MULCIBER. See *Vulcan*.

MULDAU. See *Moldau*.

MULE is the produce of a jackass with a mare, and has a large, clumsy head, long, erect ears, a short mane, and a thin tail. The produce of a she-ass and a stallion, called *bardeau* by Buffon, is a much inferior animal. The head is long and thin, the ears are like those of a horse, the mane is short, and the tail well filled with hair. The former, or *mule*, commonly so called, is much valued for the saddle, and for drawing carriages, in Spain, Portugal, Italy, the East, and in Spanish America. In these countries, where great attention is paid to the breed, it is very well-limbed, as tall as the horse, but not so handsome, especially about the head and tail. These animals are mostly sterile; some, indeed, have thought that they are altogether incapable of producing their kind; but some few instances have occurred in which female mules have had foals, and in which the male has impregnated females, both of the ass and horse species; but such instances are very rare. Mules have been much employed, both in ancient and modern times. The Roman ladies had equipages drawn by mules; and, at this day, in Spain, the coaches of the nobility, and even of the princes, are usually drawn by them. Savoy produces very large ones, but the finest are bred in Spain. Mules are chiefly used in countries where there are rocky and stony ways, as about the Alps and Pyrenees, &c. They are sometimes fifteen or sixteen hands high. They are very proper for large burdens, and are remarkably sure-footed. They are much stronger for draught than our horses, are often as thick-set as dray-horses, and will travel several months together, with six or eight hundred weight on their backs. They are much hardier than the horse, cheaper kept, subject to fewer diseases, and will live and work twice as long. They take so much after the mare from which they are bred, that they may be procured of any kind, light or strong, as the owner pleases. The stubbornness complained of in them is owing only to ill treatment.

MULE, in manufactures; a machine, invented by Crompton, in 1779, for producing finer yarn than was spun by the machines previously in use, and which has now nearly superseded the jenny. (See *Cotton Manufacture*.) For producing threads of the finest kind, a process is necessary which is called *stretching*, and which is analogous to that which is performed with carded cotton upon a common spinning-wheel. In this operation, portions of yarn several yards long are forcibly stretched in the direction of their length, with a view to elongate and reduce those places in the yarn which have a greater diameter and are less twisted than the other parts, so that the size and twist of the thread may become uniform throughout. To effect the process of stretching, the spindles are mounted upon a carriage, which is moved back and forwards across the floor, receding when the threads are to be stretched, and returning when they are to be wound up. The yarn produced by *mule-spinning* is more perfect than any other, and is employed in the fabrication of the finest articles. The sewing-thread spun by mules is a combination of two, four, or six constituent threads, or *plies*. Threads have been produced of such fineness, that a pound of cotton has been calculated to reach 167 miles.

MULGRAVE ISLANDS; an archipelago in the Pacific ocean, lying between lat. 3° S. and 12° N., and lon. 160° and 177° E. It is composed of the groups of Browne, Raiick, Radack, Scarborough, and Kingsmill. The name is also applied, in a more limited sense, to a small group of islands in the southern part of the group of Radack, lat. 6° N., lon. 173° E. This group was examined by lieutenant Percival, in the United States schooner Dolphin, in 1825, more fully than had been previously done. (See Paulding's

Cruise in the Pacific, and Visit to the Mulgrave Islands, New York, 1831.) The islands are low, of a coral formation, and producing the cocoa and bread-fruit trees. The inhabitants are lively, intelligent, timid, and gentle. The group forms a circular chain of narrow strips of land, about half a mile wide, enclosing an inland sea 140 miles in circumference.

MULGRAVE, Constantine John Phipps, lord, born in 1744, early entered the naval service. In 1773, the British government having determined to send out an expedition to reach the north pole, captain Phipps received the command of the two bomb-vessels, Racehorse and Carcass, destined for the voyage. The latter was commanded by lieutenant Lutwidge, under whom Nelson was cockswain. The expedition left the Nore June 4th, and on the 29th arrived off Spitzbergen. It returned in September of the same year, after having reached 80° 48′ of north latitude, beyond which an unbroken and impenetrable field seemed to stretch to the pole. Lord Mulgrave inherited his title (Irish) on the death of his father, in 1775, and was afterwards commissioner of the admiralty. He died in 1792.—See his *Journal of a Voyage towards the North Pole* (London, 1774).—His brother *Henry* was born in 1755, entered the army in 1775, served in North America, as aid to general Knyphausen, and returned with the rank of lieutenant-colonel. In 1781, he was elected member of parliament, and entered fully into Pitt's system of politics. In 1792, by the death of his elder brother, Constantine John, he succeeded to the title and family estate. On the breaking out of the French war, he was employed in some confidential mission by Mr Pitt. Mr Pitt, in 1804, made him chancellor of the duchy of Lancaster, and in 1807 he was nominated first lord of the admiralty. In 1812, he was removed from the admiralty to be master-general of the ordnance, and was raised to the rank of viscount and earl, by the title of *viscount Normanby and earl of Mulgrave*. In 1818, he resigned the place of master-general of the ordnance to the duke of Wellington, but was, by a special agreement, to hold a seat in the cabinet. He died in 1831. His son succeeded to his titles.

MULL; an island of the Hebrides, considered to belong to Argyleshire. Its extreme length is thirty-five miles, and its greatest breadth is thirty; superficial area, 420 square miles. The island is, for the most part, rugged and mountainous; and Benmore, the highest mountain is supposed to be elevated three thousand feet above the level of the sea. Agriculture, of recent years, has been greatly improved. The land is more peculiarly adapted for grazing, and there is a very hardy race of black cattle, of small size. The principal village is Tobermory. Population, about 10,000. Lon. 6° W.; lat. 56° 30′ N. Between it and the main land of Argyle and Inverness shires, is the sound of Mull. See *Hebrides*.

MULLEIN. The common European mullein (*verbascum thapsus*) grows in old fields, road-sides, &c., in barren soil, and is a conspicuous plant. The root is biennial; the stem simple, cylindrical, two or three feet high, and, together with the leaves, is covered with a very thick down. The flowers are yellow, almost sessile, and are disposed in a long cylindrical spike. It is of very little utility, and is avoided by all animals except goats. About eighty species of mullein are known, most of them natives of the regions about the Mediterranean.

MULLER, John. See *Regiomontanus*.

MULLER, John von, a celebrated historian, born at Schaffhausen, in 1752, was the son of a preacher and schoolmaster there, and was indebted to his maternal grandfather for the future bent of his mind. Before he had learned to read, he had become familiar with the principal events of Swiss history, through the conversation of the kind and enthusiastic old man. His diminutive size, shortness of sight, and delicate constitution, prevented him from engaging in the sports of his age, while his studious disposition and warm heart excited the hopes and won the affections of his elders. At the age of nine years, he wrote a history of his native city; and to the ancient classics, which he began to read secretly in his thirteenth year, he was indebted for that love of liberty and moral grandeur, that clearness and method of thought, and elegance and energy of expression, which appear even in his school exercises. Being intended for the church, he went to Gottingen in 1769, where his teachers were Michaelis, Walch, Less, and Miller, and his favourite studies, exegesis and ecclesiastical history. The influence of Schlozer soon induced him to renew his historical studies, the first fruits of which appeared in his *Bellum Cimbricum* (1772). On his return to Schaffhausen, Muller preached with success, and was appointed professor of Greek in the gymnasium. Here he formed an intimacy with Charles Victor von Bonstetten, which gave rise to the admirable Letters of a young Scholar to his Friend (in German, published in 1802). Bonstetten procured him the place of family tutor, at Geneva; and the celebrated Bonnet afterwards received him into his house. The years 1777 and 1778 were spent in excursions through Switzerland, in studying the sources of Swiss history, and the ancient classics. During the winter of 1778, he delivered lectures on universal history. The substance of these lectures is given in the Twenty-four Books of Universal History, which form the three first volumes of his works. The first volume of his History of the Swiss was published at Berne (the titlepage said Boston) 1780, and he soon after went to Berlin, where he published his *Essais historiques*. Although Frederic II. (the Great) received him with distinction, no provision was made for him, and he was disappointed in his expectations of obtaining a place in the academy; he therefore left Berlin, and became professor of history at Cassel (1781). Here he produced his treatises *De l'Influence des Anciens sur les Modernes*, and *De l'Etablissement de la Domination temporelle du souverain Pontife au 8me Siècle*. In 1783, Muller returned to Geneva, and renewed his examination of the documents of the history of Switzerland. In 1786, he was invited to Mentz by the elector, with the post of librarian and court counsellor, and here published a new edition of the first volume, with a second volume of his history. Some political treatises, which he published at Mentz, contributed to extend his reputation, and to raise him to higher dignities at the electoral court. In 1791, the emperor created him baron of the empire, with a patent of nobility. When Mentz fell into the hands of the French (1792), Muller, who had no sympathies with the revolution, went to Vienna, and was made a member of the privy chancery of court and state. His pamphlets on the occasion of the separate peace of Prussia, *Die Uebereilungen und der Reichsfriede* (1795), and those entitled *Die Gefahren der Zeit*, and *Das sicherste Mittel zum Frieden* (1797), are master-pieces of eloquence. In 1800, he was appointed first keeper of the imperial library, and now found time to devote to his historical studies, which had been interrupted by his political duties and the troubled state of the country. In 1804, he left Vienna, and went to Berlin, where he devoted himself entirely to his studies. Several treatises which he published on the History of Frederic II., on the Decline of Liberty among the Ancients, &c., are contained in the eighth volume of his works. He was preparing materials for writing the history of

Frederic the Great, when the battle of Jena put a stop to his labours. Napoleon had a conversation with him at Berlin, and treated him with much distinction. The genius and kindness of the emperor won his esteem, and, in his discourse *De la Gloire de Frederic*, delivered before the academy, he spoke of him in favourable terms. This made Muller an object of suspicion in Prussia: he was, therefore, more ready to accept a place at the university of Tubingen; but while on his way thither, received the information of his appointment as secretary of state to the kingdom of Westphalia, which post he entered upon with reluctance. He was finally permitted to resign it in 1808, and died in 1809. The first division of the fifth volume of his History of Switzerland was published in 1808. His complete works were published at Tubingen, in 1810, &c., in twenty-seven volumes. His letters (vol. 4—7 and 13—18) contain important materials for forming a just estimate of his character. Heeren's *Muller der Historiker* (Leipsic, 1809) presents an impartial view of his services and his faults. His great work—*Geschichte Schweizerischer Eidgenossenschaft*—comes down only to 1489. It is distinguished for accuracy of research, profound and broad views, and, although minute, is not dry.

MULLER, John Gotthard von, one of the most eminent engravers of Germany, was born in Wurtemberg, 1747, and early displayed so much talent, that the duke sent him to Paris in 1770. Here he studied engraving under the celebrated Wille, made rapid progress, and was chosen member of the academy of arts. He was soon after invited to Stuttgard, by the duke of Wurtemberg, as professor of the academy in that place, and there published the master-pieces by which he has become celebrated. His principal historical pieces are the Battle of Bunker Hill, from Trumbull, and the Madonna della Sedia of Raphael. He is particularly remarkable for the purity and softness of his burin. He died in 1830. His son *John Frederic William*, born at Stuttgard in 1782, was also a distinguished engraver. He received his education at the gymnasium in Stuttgard, and was instructed by his father, in geometry and perspective. His attempts with the burin were successful beyond expectation, and, in compliance with the precepts and example of his father, he employed himself assiduously in the study of drawing. At the age of twenty years, he went to Paris, and applied himself with such excessive ardour as to injure his health; he likewise practised oil-painting, and executed three portraits from nature. While at Paris, he engraved the Venus of Arles for the *Musée Français*, and a statue *La Jeunesse* for Robillard: the latter exhibited a wonderful skill in imitating the appearance and expression of marble, on copper. In 1805, he painted and engraved the portrait of the crown prince, since king of Wurtemberg; began the famous John, after Domenichino, and drew the St Cecilia of the same master. In 1808, it was proposed to him, by Rittner, a dealer in works of art, to engrave Raphael's Madonna del Sisto, in the Dresden gallery; and, animated by the greatness of the undertaking, he determined to devote all his powers to its execution, and, previously, to study his art in Italy. In 1809, he returned from Italy, and entered, with his usual industry, upon his great work. In the mean time, he executed several works, such as the portraits of Jacobi, Schiller, and Hebel, and the Adam and Eve, after Raphael. In 1814, he was appointed professor in the Dresden academy of arts; but his health began to fail, and he exhausted the last remains of his mental and bodily vigour in the completion of his favourite work. He died in 1816, without having seen an impression of this splendid production.

MULLER, Frederic, usually called *Maler Muller*, or *Muller the Painter*, born at Creuznach, in 1746, published, as early as his eighteenth year, and subsequently, several collections of etchings (animals, compositions in the Flemish style, pastoral scenes, &c.), which were remarkable for their originality and freedom. In 1776, he went to Rome, and studied the works of Michael Angelo, but without much success. Like many of those who imitate that master, in attempting to copy his grandeur, he fell into an exaggerated style. As a poet, he deserves more credit. At a time when German poetry had degenerated into a mere versified prose, Muller appeared among the great writers who gave a new impulse to German literature. (See *German Literature*.) His complete works were published at Heidelberg (1811, 3 vols.). The principal are Niobe, Faust, and Genevieve. They are characterized by richness of fancy, warmth of passion, and elevated delineation of character, though sometimes wild and disconnected. He died at Rome, in 1825, in the eightieth year of his age.

MULLER, William, a German poet, born at Dessau, 1795, studied at Berlin (1812), where his favourite branches were the historical and philological. The war of 1813 called him from his books, and he was present, as a volunteer, in the Prussian army, at the battles of Lutzen, Bautzen, Hanau, and Culm. In 1814, he returned to his studies at Berlin, and cultivated the old German poetry and literature. His early display of talents had induced his father (a mechanic, in moderate circumstances) to allow him to follow his own inclinations; and, at Berlin, he had enjoyed the advantage of the instructions of Bockh, Buttmann, Ruhs, and Uhden. His journey to Italy (1819) produced his ingenious work *Rom, Romer, und Romerinnen* (Berlin, 1820); and, on his return to Germany, he became teacher of Latin and Greek, in the newly established school at Dessau, where he was also appointed ducal librarian. In 1824 appeared his *Gedichte aus den hinterlassenen Papieren eines reisenden Waldhornisten*, which displays great poetical merit. His *Lieder der Griechen* (1825) celebrates with poetic fire, the awakening of an oppressed nation, its struggle, and its victory. His *Lyrische Spaziergange* displays the same truth to nature, freshness, and fire, and the same harmony of language, which characterize his other poems. He also contributed many critical papers to several German periodicals and encyclopædias, and his *Homerische Vorschule* (1824) is a work of much learning. His *Bibliothek Deutscher des* 17 *Jahrhunderts* (10 vols., Leipsic, 1822—27) is a valuable collection of the best lyric poems of that period. He died in 1827. His works were collected in 5 volumes (Leipsic, 1830).

MULLET (*mullus*, L.); a genus of acanthopterygian fishes, distinguished by the oblique form of their head; by two long appendages under the chin, and large scales on the head and body, which are very easily detached. Their body is oblong, and generally of a red or yellow colour; their head of a moderate size; their eyes situated close to each other. The most celebrated species is the *M. barbatus*, which is found in the Mediterranean. These fish were held in great estimation among the epicures of ancient Rome, and were sometimes sold for their weight in silver. Pliny gives an instance where about £60 were given for a single fish, of about three pounds' weight. Juvenal also records the height to which luxury had attained in his days, in speaking of the prices given for the mullet—"*Mullum sex millibus emit, Æquantem sane paribus sestertia libris.*" But the extravagance of these conquerors of the world was still more strongly exemplified in the mode in which these fishes were served up: there was a vessel of water, in which the fishes were alive, in the eating room, whence it was conveyed immediately to the fire, and dressed in the same apartment. It was even customary to place them in glass vases, that the guests might be gratified by observing the changes of colour which they underwent in expiring. Apicius, that prince of epicures, "*nepotum omnium altissimus gurges*," hit upon a mode of suffocating them in a certain pickle, which heightened their flavour. In modern times, they are but little esteemed, though their flesh is white, fat, and well tasted. The roes are known in Italy, under the name of *botargo:* they are prepared in a peculiar manner, and are highly prized.

MULTIPLE, in arithmetic, is a number which contains another number a certain number of times. Thus eighteen is a multiple of six, or of three, or of nine, &c. *Common multiple* of two or more numbers is that which contains those numbers a certain number of times. Thus thirty-six is a common multiple of four and nine, being equal to nine times the first, and four times the second. To find the *least common multiple* of several numbers: reduce them all to their prime factors, then the product of the greatest powers of those prime factors is the least common multiple required. Let it be proposed to find the least common multiple of twelve, twenty-five, and thirty-five, or the least number that will divide by each of them without a remainder. Here $12=3\times 2^2$; $25=5^2$; and $35=5\times 7$; therefore $3\times 2^2\times 5^2\times 7=2100$, the least common multiple required.

MULTIPLYING GLASS, in optics; one wherein objects appear increased in number. It is otherwise called a *polyhedron*, being ground into several planes that make angles with each other, through which the rays of light, issuing from the same point, undergo different refractions, so as to enter the eye from every surface in a different direction.

MULTIVALVES, in natural history; the name of a general class of shell-fish, consisting of three or more shells.

MULTNOMAH; a river of the Oregon Territory, which rises in about lat. 40°, among the Rocky mountains, runs about 500 miles through a country of extreme fertility, and unites with the Columbia, opposite Wappatoo island. The first part of the country through which it flows is level and open, but the remainder, and much the larger part, is covered with a forest, which is probably not exceeded by any on the globe for the size of its trees and the excellence of their timber. The Multnomah is 500 yards wide at its mouth, and has five or six fathoms of water. There is a sand-bar at its mouth, but it is otherwise free from all obstructions to navigation for seventy miles.

MUM; a malt liquor, which derives its name from the inventor, *Mumme*, a German. It was formerly exported from Germany in large quantities, but is now less used.

MUMMIES (by some derived from the Arabic *momia*, or the Coptic *mum*, bitumen or wax); the dead bodies of the Egyptians, which were preserved by embalming. Owing either to the religious opinions of the Egyptians, or to the nature of the country, which rendered interment inconvenient, or the want of fuel, which rendered burning difficult, they embalmed all their dead, and deposited them in subterraneous chambers, or in grottoes excavated in the mountains. An immense number of them has been found in the plain of Saccara, near Memphis; hence called the *plain of the mountains*, consisting not only of human bodies, but of various animals, or heads of animals, bulls, apes, ibises, crocodiles, fish, &c. Numerous caves or grottoes, with contents of the same kind, are found in the two mountainous ridges which run nearly parallel with the Nile from Cairo to Syene. Some of the most remarkable of these tombs are those in the vicinity of ancient Thebes, in the Lybian mountains, many of which were examined by Belzoni, and those near Eleithias (described by Hamilton), farther up the river, which, though less splendid than the Theban sepulchres, contain more illustrations of the private life of the Egyptians. The sepulchral chambers are almost entirely covered with fresco paintings and bass-reliefs, and frequently contain statues, vases, &c. Some of them (the royal sepulchres) consist of suites of spacious halls and long galleries of magnificent workmanship. Those of private individuals vary according to the wealth of the deceased, but are often very richly ornamented. Many of these tombs have been ransacked by Arabs for the purpose of plunder, and great numbers of the mummies destroyed for the resin or asphaltum they contain, which is sold to advantage in Cairo. The tombs and mummies are, many of them, two or three thousand years old, and are, in part, indebted for their preservation to the dryness of the soil and the mildness of the climate. The processes for the preservation of the body were very various. Those of the poorer classes were merely dried by salt or natron, and wrapped up in coarse cloths, and deposited in the catacombs. The bodies of the rich and the great underwent the most complicated operations, and were laboriously adorned with all kinds of ornaments. Embalmers of different ranks and duties extracted the brain through the nostrils, and the entrails through an incision in the side; the body was then shaved, washed, and salted, and, after a certain period, the process of *embalming* (q. v.), properly speaking, began. The whole body was then steeped in balsam, and wrapped up in linen bandages; each finger and toe was separately enveloped, or sometimes sheathed in a gold case, and the nails were often gilded. The bandages were then folded round each of the limbs, and finally round the whole body, to the number of fifteen to twenty thicknesses. The head was the object of particular attention; it was sometimes enveloped in several folds of fine muslin; the first was glued to the skin, and the others to the first; the whole was then coated with a fine plaster. A collar of cylindrical glass beads of different colours, is attached to the masks which cover the head, and with it is connected a tunic of the same material. The beads, both in the collar and tunic, are so arranged as to form images of divinities, of the scarabæus, the winged globe, &c. Instead of this, the mummy is sometimes contained in a sort of sheath, made of paper or linen, and coated with a layer of plaster, on which are paintings and gilding. These paintings represent subjects relating to the duties of the soul, its presentation to the different divinities; and a perpendicular hieroglyphical inscription in the centre gives the name of the deceased, and of his relations, his titles, &c. The whole is then placed in the coffin. Those mummies which have been examined present very different appearances. One class has an opening in the left side, under the arm-pit, and in another the body is whole. Some of those which have been opened have been dried by vegetable and balsamic substances, others by salt. In the former case, aromatic gums or asphaltum were used (the gums, when thrown into the fire, gave out an aromatic odour); in these the teeth and hair are generally preserved; but if exposed to the air, they are soon affected. Those prepared with asphalt are of a reddish colour, and are in good preservation. Those dried with saline substances are of a black, hard, smooth appearance. On exposure to the air, they attract moisture, and become covered with a saline substance. Those mummies which have no opening are also partly preserved by saline substances, and partly by asphalt. In the latter, not only the cavities of the body are filled with it, but the flesh, bones, and every part, seem to be penetrated by it: it was probably injected in a hot state. These are the most commonly met with. They are hard, black, and without any disagreeable smell. The whole mummies prepared with salt alone are white and smooth, and resemble parchment. The coffin is usually of sycamore, cedar, or pasteboard; the case is entire, and covered, within and without, by paintings, representing funeral scenes, and a great variety of other subjects: the name of the deceased is also repeated on them in hieroglyphic characters. The cover, which is also entire, is ornamented in the same manner, and contains, too, the countenance of the deceased in relief, painted, and often gilded. The breast is covered with a large collar; a perpendicular inscription occupies the centre, and funeral scenes the sides. The coffin is often enclosed in a second, and even third case. See in the Philosophical Transactions, for 1825, an Essay on Egyptian Mummies, by A. B. Granville, M.D.

The name of *mummies* is likewise given to human bodies preserved in other ways, either by accident or by some artificial preparations. The Guanches, or aboriginal inhabitants of the Canaries, preserved the bodies of their deceased friends, which have been found in great numbers in the catacombs in Palma, Ferro, Teneriffe, &c. The natives called them *xaxos*. They are dry, light, of a yellow colour and strong odour, and often injured by worms; they are enveloped in goat skins, and enclosed in cases. They are supposed to have been dried in the air, after having had the entrails removed; and they were also covered with a sort of aromatic varnish. Humboldt found mummies prepared in a similar manner in Mexico. The Peruvians, also, had the art of preserving the bodies of their incas. Mummies were formerly used in medicine, under the name of *mumia vera*, on account of the balsam they contained; but they have long ceased to be so employed. See Sieber, *Ueber Ægyptische Mumien* (Vienna, 1820); Granville *On Egyptian Mummies* (London, 1825). The burial-place of the Capuchin monastery, at Palermo in Sicily, is a large subterranean vault, divided into several wide and lofty galleries, in the walls of which are niches containing several hundred human bodies, kept in an upright position by being fastened to the wall behind, and clothed in their usual dress. The monks have a peculiar manner of preserving bodies, which they keep secret. Natural mummies are frequently found preserved by the dryness of the air. In a vault of the cathedral at Bremen, called the *lead-cellar* (because it was formerly employed for melting lead, for aqueducts and organ pipes), are bodies in good preservation. In the monastery of St Bernard, on mount St Bernard, the bodies of travellers who have been buried in the snow, are deposited in a chapel, in which there are open windows, protected by grates. They are placed in a sitting position, leaning each on another's breast. The cold prevents their putrefaction, and gives them time to dry. The Gaulish mummies, in the cabinet of comparative anatomy, in the Jardin du Roi, were found in Auvergne, in the last century. They bear no marks of any balsamic preparation, but are enveloped in linen, and appear to have been interred with great care. It is uncertain whether their preservation was owing to the nature of the soil, or to a peculiar and now unknown process of embalming. Dried bodies have also been found in some of the saltpetre caves of the western parts of the United States of America.

MUMPS; the common name of the disease called, in scientific language, *cynanche parotidea*. It comes on with the usual febrile symptoms, which are soon attended with a swelling of the jaws and neck, sometimes on one side only, but commonly on both. The causes of it are not known with certainty. Children are more subject to it than adults. It seems, sometimes, to be the effect of cold. It is often epidemic, and, according to Cullen, is contagious. In general, it runs its course without dangerous symptoms, and hardly requires any remedies; exposure to the cold should be avoided. The mean duration is from ten days to a fortnight.

MUNCER, Thomas. See *Müntzer*.

MUNCHHAUSEN, Jerome Charles Frederic von, the original of the well-known narrator of wonders, was a German officer who served several campaigns against the Turks in the Russian service. He was a passionate lover of horses and hounds; of which, and of his adventures among the Turks, he told the most extravagant stories; and his fancy finally so completely got the better of his memory, that he really believed his most improbable and impossible fictions, and was very much offended if any doubt was expressed on the subject. In relating these monstrous lies, his eyes would shine and start out of his head, his face became flushed, the sweat rolled down from his forehead, and he used the most violent gestures, as if he were really cutting off the heads of Turks, or fighting the bears and wolves that figure in his stories. Having become acquainted with the poet Bürger at Pyrmont, and being pleased with his society, Münchhausen used to relate those waking dreams to him; and the poet afterwards published them, with his own improvements, under the title of *Wunderbare Abentheuer und Reisen des Herrn Von Münchhausen*, translated from the English, London (Gottingen), 1787. A part of them had already appeared in the third volume of the *Deliciæ Academicæ* (Heilbronn, 1665), under the title of *Mendacia Ridicula*. The wit and humour of the work gave it great success, and it was translated into several foreign languages. When it appeared in England, the British reviewers laboured to show that it was a satire upon the ministry. Münchhausen was very angry at the liberty thus taken with his name, and Bürger became involved in some difficulties in consequence. An enlarged edition was published by Schnorr, in four volumes (Gottingen, 1794—1800). Münchhausen when quite advanced, married a very young wife, who, to the astonishment of every one, presented him with a son, the consequence of which was a suit prosecuted by his relations after his death, in 1797, in support of their claims to his estate.

MUNICH (in German, *München*), capital of the kingdom of Bavaria, a royal residence and archiepiscopal see, lies in a plain on the left bank of the Isar (Iser); lat. 48° 8′ N.; lon. 11° 35′ E. The population, including the suburbs of Au and Haidhausen and the military, is 92,000. It is surrounded with a rampart, but is not a place of great strength; on the outside of the rampart are the suburbs. The streets are generally broad and straight, but not well paved; the houses high, and of good appearance; the public edifices numerous; and the city is accounted one of the handsomest in Germany; few of the old towns on the continent make a better appearance. The royal palace is a large edifice, plain in its exterior, but in its interior magnificent. The most remarkable apartment is the *kaiser-saal*, or emperor's hall, one of the grandest in Germany. There are several other palaces; twenty-two churches, some of them magnificent; council-house, arsenal, barracks, mint, theatres, operas, &c., &c. There are many charitable institutions, which are extensive and well supported. The literary and scientific establishments are numerous, among which are the central library, said to contain 400,000 volumes (20,000 of them *incunabula*), and 9000 manuscripts; the royal cabinet of medals, containing 10,000 Greek and Roman coins; the museum of antiquities, said to be the most complete in Germany; the academy of sciences, erected in 1759, having an extensive collection of specimens of natural history, models, and instruments; the military academy, lyceum, gymnasium; the veterinary and surgical schools, observatory, cabinet of medals, gallery of pictures, and botanic garden. In 1827, the university of Landshut was transferred to Munich; it has an agricultural chair, a botanical garden, anatomical and chemical institutes, and, in 1829, had 1800 students. The environs of the city are pleasant, being enlivened by gardens and various places of public resort. The Iser is not navigable; and Munich is not distinguished for trade or manufactures. The city has been much embellished and enlarged within the last fifteen years, particularly by the taste of the present king. Among the recent erections are the *Odeon* (principal hall, 130 feet long, 75 broad); the New Palace (680 feet long, 150 high), in front of which is a bronze statue of the late king; the *Pinakotheca*, or new edifice intended for the reception of the picture gallery, the Boisserée collection, the works of art, which were purchased by the king in Italy, &c., in nine halls and twenty-three cabinets; the *Glyptotheca* (q. v.); All Saints' chapel, painted in fresco, by Hess, &c. Munich was founded in 962, by Henry, duke of Saxony and Bavaria, on an estate belonging to the monks of Scheffelar, whence its name (*München*, from the German *Mönchen*, monks). The emperor Louis the Bavarian conferred on the city its privileges in 1315, and in 1392, it became the residence of the younger Bavarian line, which survived the others, and thus rendered Munich the capital of Bavaria. It was captured by Gustavus Adolphus in 1632, by the Austrians after the battle of Blenheim (1704), and again in 1741. (See *Bavaria*.) The French entered it in 1800.

MUNICIPIA were those towns in the Roman empire which elected their own magistrates (*duumviri, collegium decurionum*), and were governed either according to the Roman law, or their own laws. In the first case, they possessed the right of Roman citizenship in its widest extent (*municipia cum suffragio*); in the latter case, they could only attain to military offices of honour.

MUNNICH, Burkhard Christopher, count of, born in the duchy of Oldenburg, 1683, where his father was a privy counsellor, received a careful education, then travelled to France, and, in 1701, became a captain in the Darmstadt troops. In 1705, he entered the service of Cassel, in which he attained the rank of colonel, after his liberation from captivity (he had been taken by the French in the battle of Denain). In 1716, he entered as colonel into the Polish-Saxon service, and in 1717, became major-general. Driven thence by the intrigues of the field-marshal general count Flemming, he entered the Swedish, and after the death of Charles XII. in 1720, the Russian service. May 22, Peter the Great made him lieutenant-general. Catharine I. conferred on him the order of Alexander. Peter II. made him, in 1727, general-in-chief, and in 1728, gave him the title of *count*. In 1731, he became, under Anna, field-marshal-general, and president of the imperial military college. As such, he new-modelled the Russian army. In 1734, he besieged and took Dantzic; was, on his return, sent to Warsaw to quiet the troubles which had broken out among the Poles, and, in 1735, made a campaign against the Turks. In this war, he laid waste the Crimea in 1736, conquered Otchakow in 1737, crossed the Dniester at Sinkowza, defeated the Turks at Stewutschan, took the fortress of Choczim, and occupied Moldavia. His further progress was stopped by the peace concluded between the German emperor and the Turks, which was followed by a peace between Russia and Turkey, September 18, 1739, at Belgrade. When Anna was on her death-bed, he induced her to appoint Ernest John, duke of Courland, regent of the Russian empire, and guardian of her successor, Ivan, during his minority, because he hoped in this way to become himself the virtual sovereign, while the duke was merely a nominal ruler. But being disappointed, he effected the downfall and imprisonment of the duke; after which the princess Anna, mother of Ivan, became the nominal regent. Munich, not being able to become generalissimo, now had himself declared prime-minister, and, as such, effected a defensive alliance with Prussia. But the regent having formed a connexion with the courts of Vienna and Dresden, Munich conceived himself injured, and demanded his dismission, in May, 1741. Having obtained it, he was on the point of going to Konigsberg, when he was arrested by the order of the princess Elizabeth (who, in December, 1741, had obtained forcible possession of the throne), and was condemned to death: but the sentence was commuted into the confiscation of his estates, and banishment to Pelim, in Siberia, where he remained till Peter III. recalled him, in 1762, and restored him to his former dignities. He died in 1767, aged eighty-four. He wrote *Ebauche pour donner une Idée de la Forme du Gouvernément de l' Empire de Russie* (Copenhagen, 1774).

MUNOZ, John Baptist, a Spanish historian, was born in 1745, at Muserus, a village near Valencia, and studied in the university of Madrid. At the age of twenty-two, he wrote prefaces to the rhetoric of Louis of Grenada, and the logic of Vernei, both which displayed great erudition. He was appointed cosmographer of the Indies, in which situation, by order of the king, he began a history of America, of which he lived to publish only one volume, under the title of *Historia del Nuevo Mondo*. His other works, by which he acquired great reputation, are *De Scriptorum gentilium Lectione et profanarum Disciplinarum Studiis ad Christianæ Pietatis Normam exigendis* (Valencia, 1768); *De recto Philosophiæ recentis in Theologia Usu Dissertatio* (ibid. 1767); *Institutiones philosophicæ* (ibid. 1768); a Treatise on the Philosophy of Aristotle, &c. He died in 1799.

MUNSTER; the south-west province of Ireland, comprising the six counties of Waterford, Tipperary, Cork, Kerry, Limerick, and Clare, which see. See also *Ireland*.

MUNSTER; capital of the Prussian province Westphalia, see of a Catholic bishop, with a population of 20,837 inhabitants; lat. 51° 58′ N.; lon. 7° 36′ E. The fortifications are now converted into walks. Besides the cathedral, which contains numerous monuments of art, and the handsome church of St Lambert, on the tower of which are still seen the three iron cages, in which were suspended the remains of John of Leyden, Knipperdolling, and Krechting (1536), there are nine other churches, an episcopal palace, several hospitals and learned institutions. The Catholic university here was suppressed by the king in 1818, and its funds appropriated to the seminary for Catholic theologians (founded in 1824), to the gymnasium in Munster and Paderborn, and the seminary for Catholic priests. The gymnasium has a library of 25,000 volumes. Munster was anciently called *Meilend*, afterwards *Meningerode*, and finally received its present name from the splendid church and monastery (in German, *Munster*) erected by Charlemagne in the eighth century. In the sixteenth century, it was the theatre of the fanatical violence of the Anabaptists. In 1648, the peace of Westphalia was signed in the hall of the council-house, which still contains the portraits of the ambassadors present on that occasion.

MUNSTER, Peace of. See *Westphalia, Peace of.*

MUNTER, Balthasar, born at Lubeck in 1734, studied theology at Jena, was preacher to the orphan asylum in Gotha (1760), and afterwards to the German society of St Peter in Copenhagen, where he died in 1793. His sermons are esteemed for their practical character. He was also the author of *Geistliche Cantate* (1769) and *Geistliche Lieder*. Munter was appointed to prepare the unfortunate count Struensee for death, and wrote an account of his conversion, which was translated into almost all the European languages.—His son *Frederic*, bishop of Seeland and primate of the Danish church, born at Gotha in 1762, studied theology in the university at Copenhagen, and then spent two years at Gottingen. In 1783, he visited Italy and Sicily, resided some time in Rome, and, returning to Copenhagen, in 1788, was appointed extraordinary professor of theology, in 1790, ordinary professor in the university, in 1808, bishop of Seeland and knight of the Danebrog, and died in 1830. Among his numerous and learned works, the most important are his description of the Two Sicilies; *Specimen Versionum Danielis Copticarum* (Rome, 1786), from a manuscript discovered by him in Rome; Statutes of the Templars (also discovered by him); Religion of the Carthaginians (second edition, Copenhagen, 1821); Antiquarian Essays; *Miscellanea Hafnensia* (2 vols., 1816—25); Ecclesiastical History of Norway and Denmark (third vol. left in MS.); the Star of the Wise Men, containing investigations into the year of Christ's birth.—His daughter *Frederica Brun*, born at Tonna in 1765, married a Danish counsellor in 1783, is distinguished for her poetical and prose writings. In 1791, she travelled in France and Switzerland, and, in 1795, visited Italy, whither she again returned in 1805, and spent several years in Italy and Switzerland. Her travels are described in her *Episoden*, her *Briefe aus Rom*, &c. Her poems have also been published in three volumes.

MUNYCHIA; one of the ports of Athens, between the Pyræus and Sunium. See *Athens*.

MUNZER, or MUNTZER, Thomas, a celebrated German fanatic, was born at Stolberg in the Hartz. If the tradition, that his father was illegally executed by a count, is true, this circumstance may account for the direction which his feelings afterwards assumed. He probably studied at Wittenberg, where he received the degree of master. He was afterwards a teacher at Aschersleben, and preached for several years in different places, every where displaying a violent enmity to the papacy. Luther's doctrines began about this time to spread widely, and men's minds were roused to shake off the papal yoke; but at the same time the spirit of fanaticism began to spread abroad. Whilst Luther was shut up on the Wartburg, and Carlstadt was committing the greatest violences in Wittenberg, the sect of Anabaptists was formed at Zwickau, by Klaus Storch, a clothier, with whom Mark Stubner, Martin Kellner, and Munzer associated themselves. They entered Wittenberg with their followers; but Luther attacked them with such force, that both Storch and Carlstadt were obliged to leave the city. Munzer promulgated his doctrines with more zeal and success at Altstedt in Thuringia, where he preached from 1523. He assailed the papacy and Luther with great violence, and excited the people to revolt against the authorities, particularly after they were forbidden to attend his preaching. He easily persuaded them that God would soon deliver Christendom from the yoke under which it groaned. His followers increased so rapidly, that Frederic, elector of Saxony, and John, duke of Weimar, summoned him to Weimar, to answer for his conduct, in 1524. Nothing further, however, was done, than to direct the authorities of Altstedt to remove so dangerous a person from the city. Munzer disappeared, and was not heard from again for a year, when he made his appearance at Nuremberg. Not being allowed to remain there, he went to Schaffhausen, where he continued six months, and then returned to Saxony. In Muhlhausen, he gained an entire ascendency over the populace, deposed the city council, which forbade his preaching, and appointed a new one, permitted the pillage of the monasteries and of the houses of the rich, and proclaimed a community of goods. Another fanatic, by the name of Pfeifer, entered the Eichsfeld, with his troop of plundering followers, and joined Munzer. This event, and the information that 40,000 peasants had assembled in Franconia, and plundered and burned 150 castles of the nobles, and twenty-three monasteries, inflamed his zeal. He roused his adherents in Frankenhausen, the mountaineers of Mansfeld, and the peasants at Muhlhausen, Langensalza, and Tennstedt, and prepared for the war, promising his followers, that he would raise them all to the rank of nobility. Leaving Pfeiffer governor in Muhlhausen, he proceeded, with 300 chosen men, to Frankenhausen, broke off the negotiations which had been opened with the count of Mansfeld, and rekindled the ardour of the town's people. Frederic the Wise, elector of Saxony, was now dead, and his more energetic successor, John, associated himself with George, duke of Saxony, Philip, landgrave of Hesse, and Henry, duke of Brunswick, and sent a force against the insurgents, who amounted to about 8000 men, advantageously posted on a height near Frankenhausen, and protected by a barrier of wagons. The princes attempted to effect the peaceable submission of the revolters, but Munzer would not listen to terms, and was totally defeated, after an obstinate struggle, May 15, 1525. The insurgents lost from 5000 to 7000 killed, and the survivors threw themselves into Frankenhausen. Munzer concealed himself in bed, feigning sickness, but was accidentally discovered, and being carried to Heldrungen, confessed his accomplices on the rack. Pfeiffer, who attempted to flee from Muhlhausen, was also made prisoner. They were condemned, with twenty-four others, and executed at Muhlhausen. Munzer behaved with the greatest pusillanimity, and was unable even to pronounce the creed at the execution. After the decapitation, his body was impaled, and his head stuck upon a stake. See *Peasants' War*.

MURAL ARCH (from *murus*, a wall); a wall, or arched wall, placed exactly in the plane of the meridian, for fixing a large quadrant, sextant, or other instrument, to observe the meridian, altitude, &c., of the heavenly bodies.

MURAT, Joachim, the son of an innkeeper at Cahors, born in 1771, was a man of an elegant person, spirited and active, but distinguished for the most daring courage, rather than sagacity and strength of mind, and finally fell a sacrifice to his rashness. When a boy, he escaped from the college of Toulouse, where he had been placed to prepare him for the ecclesiastical profession. He was afterwards a common chasseur, and deserted; served in the constitutional guard of Louis XVI.; then entered the 12th regiment of mounted chasseurs; rose, by his zealous Jacobinism, to the rank of lieutenant-colonel;

was afterwards removed as a terrorist, and remained without employment till his fate placed him in connexion with Bonaparte, whom he accompanied as an aid to Italy, in 1796. Here he distinguished himself as a cavalry officer by his impetuous courage, and followed the general to Egypt. He decided the victory over the Turks at Aboukir, and returned with Bonaparte as general of division. On the 18th Brumaire, he expelled the council of five hundred from the hall of St Cloud, at the point of the bayonet, and in 1800 married Marie Annonciade Caroline (born in 1782), the youngest sister of the first consul. He was present at the battle of Marengo, and, in 1804, was made marshal of the empire, grand-admiral, and prince of the French empire. His services in the campaign of 1805, against Austria, in which he entered Vienna at the head of the army, were rewarded, in 1806, with the grand-duchy of Berg. The war of 1806 with Prussia, and of 1807 with Russia, where he followed up the victories of his master, with his cavalry, procured for him the distinction of occupying Madrid with a French army in 1808. Napoleon placed him on the throne of Naples, July 15, 1808. Murat, under the title of *king Joachim Napoleon*, governed with prudence and vigour, chiefly following the steps of Joseph. His attempt to conqu Sicily miscarried. His wife, a woman of sense and character, effected much good at home, while Murat himself was called to accompany Napoleon to Russia, at the head of all his cavalry. He was here defeated at Tarutina (October 18). Upon the retreat, Napoleon intrusted to him the command of the wreck of the army. The emperor accused him, in the *Moniteur*, of incapacity in this command. Murat returned to Naples full of indignation, and sought the friendship of Austria. He, however, once more fought with Napoleon, in the fatal campaign of Germany (1813). After the battle of Leipsic, he returned with his army to his kingdom, and negotiated for its preservation with Austria and Britain. The former actually concluded an alliance with him (June 11, 1814), to which Russia and Prussia acceded, in 1815; but Britain would only enter into a truce, since Ferdinand of Sicily, her ally, would receive no indemnification for Naples. The situation of Murat was consequently doubtful. He advanced with his army, in February, 1814, as far as the Po; but his hesitation in attacking the French excited the mistrust of Britain, as much as the hesitation of Britain to acknowledge him as an ally had excited his own suspicions. At the congress at Vienna, the Bourbons solicited for his dethronement, and Britain accused him of treachery. He took up arms, in 1815, for Napoleon, as was then thought, while he was yet negotiating at Vienna, and formed a plan to make himself master of Italy, as far as the Po. Towards the end of March, after Napoleon had entered France, he advanced with his army, partly by Rimini, partly by Rome, Florence, and Modena, attacked the Austrians, and called the Italians to independence, at the very time that Austria and the allies, upon his repeated assurances in March, that he would remain true to them against Napoleon, had determined to recognise him as king of Naples. It was too late. Austria, therefore, took the field against him. Forced to retreat at Ferrara by Bianchi (April 12), surrounded by Nugent, defeated by Bianchi at Macerata (or Tolentino) (May 2 and 3), Murat was deserted by the greater part of his army. May 19, he entered Naples as a fugitive. The country had now declared against him. He fled in disguise to the island of Ischia, from whence he sailed for France, and landed at Cannes, May 25. His family went on board the British fleet, and found in Austria protection and a home. Napoleon would not permit him to come to Paris. But he kept up a correspondence from Toulon with his adherents in Italy. After the overthrow of Napoleon, he escaped, in the midst of continual dangers, to Corsica, while his agent, Macirone, treated with the allies for a place of refuge for him. But, pursued as a rebel in Corsica, invited to return to Naples by his adherents and by traitors (see *Medici*), and encouraged to do so by several brave officers, who were devoted to him, he determined to sail, with 250 of his adherents, to Naples, to recover his lost throne. Every thing was prepared, when his aid, Macirone, brought an Austrian passport, and the permission to reside in Austria. It was too late. Murat set sail that very night (September 28), with six barks. A gale, on the 6th October, off the coast of Calabria, dispersed his fleet. Only two of the vessels entered the road of S. Lucido. Murat now wished to sail for Trieste, but the captain of his vessel declared that he must land for provisions. Murat then determined to go on shore. General Franceschetti and twenty-six soldiers attended him (October 8). But his declaration, "I am Joachim, your king," produced no effect. He was pursued. He forced his way back to the water, and leaped into a boat to go to his ship, but was seized and carried in chains to Pizzo, where he was brought before a court-martial, and condemned to be shot. The sentence was executed October 13. He met his fate with courage.—See the *Histoire des six derniers Mois de la Vie de Joachim Murat* (from the Italian of general Colletta, Neapolitan minister of war during the constitutional government, Paris, 1821); and general Franceschetti's *Mém. sur les Evenemens qui ont précédé la Mort de Joachim I.* (Paris, 1826). Murat's widow (see *Bonaparte*) is now called countess of Lipano, and lives under the protection of Austria, near Trieste, where she has carefully educated her four children. Her second daughter was married (1825) to count Rusponi of Ravenna. His eldest son, Achille, who resided in Florida, author of *Lettres sur les Etats-Unis*, has returned to France.

MURATORI, Louis Anthony; a distinguished Italian antiquarian and historian. He was born at Vignola, in the Modenese territories, in 1672. Having adopted the ecclesiastical profession, and received the order of priesthood, he obtained some preferment in the church. In 1684, he was made keeper of the Ambrosian library at Milan, and, subsequently, librarian and archivist to the duke of Modena. His literary productions are voluminous and valuable; but his fame principally depends on his labours as an editor of the works of others. His works fill forty-six folio, thirty-four quarto, and thirteen octavo, volumes. Among them are *Della perfetta Poesia Italiana* (1706, 2 vols., 4to); *Antiquitates Italicæ Medii Ævi* (1638, 6 vols., folio); *Novus Thesaurus Veterum Inscriptionum* (1739, 4 vols., folio); *Anecdota Latina* (4 vols., 4to); *Anecdota Græca* (4to); his great collection *Rerum Italicarum Scriptores ab Anno* 500 *ad* 1500 (27 vols., folio), of which the two supplementary volumes appeared after his death. He was also the author of *Annali d'Italia* (1744—1749, 12 vols., 4to, repeatedly republished in 18 vols., 8vo), *Dissertazioni sopra Antichità Italiane* (1751, 3 vols., 4to). Muratori died in 1750.

MURET, or MURETUS, Mark Antony; a learned French grammarian, so called from a village of the same name, in the neighbourhood of Limoges, where he was born in April, 1526. In his eighteenth year, he taught the languages at Villeneuve, and afterwards at Poictiers, Bourdeaux, and Paris. In the latter place, an accusation of an infamous nature caused him to be thrown into prison. At Toulouse, where he had settled, after obtaining his liberation, he taught jurisprudence for some time, when a second charge, of a similar nature, was brought against him, and, in 1554, he was condemned to be burned in effigy. He escaped to Padua, where, as well as at Venice, he continued to give public lectures till 1560, when he accepted an invitation given him by cardinal Ippolito d'Este to Rome. In 1563, he began to teach Greek and Latin, with philosophy and civil law, at Rome. In 1576, he took the vows, became a member of the college of Jesuits, and died in 1785. His works, consisting of orations, letters, poems, sacred hymns, &c.; *Variæ Lectiones;* four Disputations on the Pandects; On the Origin of Laws; *Carmina Juvenilia*, &c., all written with much purity and elegance, were collected in 1727 (Verona, 5 vols. 8vo). Another edition appeared at Leyden, in 1789 (4 vols.)

MURIATE OF BARYTES. See *Barytes.*

MURIATES, in chemistry; a genus of salts, formed from the muriatic acid with certain bases.

MURIATIC ACID. The name of this acid is derived from *muria*, the Latin name of sea salt, from which it is commonly extracted. It is also called, in commerce, the *marine acid*, and the *spirit of salt*. It is denominated the *hydro-chloric acid* by the French, in allusion to its composition. It is said to have been known as early as the time of Basil Valentine, though, as a gas, it was unknown till 1772, when it was obtained by Priestley, by heating the liquid acid, and receiving it in glass vessels filled with mercury. It is now procured in the gaseous form, from the decomposition of common salt by sulphuric acid, and may be collected without the use of a mercurial cistern, simply by delivering it from the gas-bottle through a narrow tube, at the bottom of a vial or jar: the gas, being of a specific gravity of 1·259, displaces the air, and completely occupies the vessel. If an inflamed taper be immersed in it, it is immediately extinguished. It is destructive of animal life; but the irritation produced by it on the epiglottis scarcely permits its descent into the lungs. It is merely changed in bulk by alterations of temperature, but experiences no change of state. It is composed of hydrogen and chlorine, in the ratio, by weight, of thirty-six of the latter to one of the former. It is absorbed with great rapidity by water. A bottle full of the gas, if opened in water, is almost instantaneously filled. Water absorbs about 500 volumes of this gas; and the solution, when cold, has the density of 1·1958, and consists of 40·39 real acid, and 59·61 water. The common process for obtaining liquid muriatic acid is the following: common salt, sulphuric acid and water, equal weights; the acid being mingled with one third of water, and, when cold, poured on the salt; the gas evolved is conducted through reservoirs of water, and subjected to pressure in contact with it. The specific gravity of the acid thus obtained is 1·17. It is always slightly tinged with yellow, from the presence of muriate of iron, derived from the vessels employed in the process. At the specific gravity of 1·203, it boils at 107°. It combines, like the other powerful acids, with the alkalies, earths, and metallic oxides, forming a very peculiar class of salts. Muriatic acid is a valuable article of the *materia medica*. It is particularly used in cases of dyspepsia that are attended with morbid secretions, also in hepatic derangements and cutaneous diseases. It is also of considerable value as a disinfecting agent.

MURILLO, Bartolomeo Esteban, the greatest of all the Spanish painters, was born at Seville, Jan. 1, 1618. He received his first instructions in the art from his relation, Juan del Castillo; but the latter having gone to settle at Cadiz, Murillo was obliged for subsistence to paint banners and small pictures for exportation to America. In that business, he obtained full employment, and began to distinguish himself as an able colourist. He was still very young, when he happened to see some works of Pedro de Moya, who was passing through Seville, on his way to Cadiz, which, being painted in the style of Vandyke, inspired him with the desire of imitating that great artist, under whom De Moya had studied shortly before his decease. The time he was able to avail himself of Moya's instruction was very short, and he resolved afterwards to repair to Italy for improvement. But his means were totally inadequate to meet the expenses of such a journey. Collecting, however, all his resources, he bought a quantity of canvass, divided it into a number of squares, upon which he painted subjects of devotion and flowers, and, with the produce of the sale of these, set out upon his journey, unknown to his relations and friends. On his arrival at Madrid, he waited upon Velasquez, his countryman, and communicated his plans to him. Struck with the zeal and talents of the young artist, Velasquez treated him with the greatest kindness, and diverted him from his project of the journey to Rome, by procuring him full employment at the Escurial, and in the different palaces of Madrid. Murillo returned to Seville in 1645, after an absence of three years. The following year, he finished painting the little cloister of St Francis; and the manner in which he executed it produced the greatest astonishment among his countrymen. His picture of the death of Santa Clara, and that of St James distributing Alms, crowned his reputation. In the first he showed himself a colourist equal to Vandyke, and, in the second, a rival of Velasquez. They obtained him a multitude of commissions, which procured him an independent fortune. His success, however, never led him to be careless. He gradually perfected his manner, by giving more boldness to his pencil, without abandoning that sweetness of colouring which distinguished him from all his rivals, increasing its strength, and giving greater freedom to his touch. He enriched the churches and convents of Seville, and other cities, with numerous works. Having been invited to Cadiz, to paint the grand altar of the Capuchins, he there executed his celebrated picture of the Marriage of St Catharine. As he was about to finish it, he wounded himself so dreadfully on the scaffolding, that he continued to feel the effects of the injury until his death, at Seville, in April, 1682. To the greatest merit as an historical painter, Murillo joined equal excellence in flowers and landscape. His works afford proofs of the perfection to which the Spanish school had attained, and the real character of its artists; for, as Murillo never quitted his native country, he could not be influenced by any foreign style; and his originality of talent places him in the first rank among the painters of every school. He has neither the charming dignity of Raffaelle, the grandeur of Caracci, nor the grace of Correggio; but, as a faithful imitator of nature, if he is sometimes vulgar and incorrect, he is always true and natural; and the sweetness, brilliancy, freshness, and harmony of his colouring, make us forget all his defects.

MURPHY, Arthur, a dramatic writer, born in Ireland, 1727, was sent, at the age of ten, to the college of St Omer, where he remained six years, and, on his return, was employed in the counting-house of his uncle, who intended to make him superintendent of an estate in Jamaica; but his inclination being averse to this destination, he repaired to his mother, then resident in London. At first, he accepted a situation in a banking-house, but was soon altogether engrossed by literature. In October, 1752, he published the first number of the Gray's Inn Journal, a literary periodical, and first essayed his dramatic powers in the farce of the Apprentice, which was followed by the Upholsterer. He soon after made an attempt as an actor, in the character of Othello, and held an engagement with Foote for a single season, and then retired. On quitting the stage, he determined to study the law, and was admitted a barrister by the society of Lincoln's Inn, in 1757. In 1759, he produced the Orphan of China, from the tragedy of Voltaire, and a variety of other pieces, of tragedy, comedy, and farce, for the groundwork of which he was generally indebted to some foreign original. Of these, the Grecian Daughter, the Way to keep him, All in the Wrong, and Know your own Mind, still keep the stage. In 1788, he retired altogether from the bar, and occupied himself entirely for the press. In 1792, appeared his Essay on the Life and Genius of Doctor Johnson; and, in 1793, he published his translation of Tacitus, with historical supplements. In 1798, appeared his tragedy of Arminius; and his warmth in favour of the then pending war obtained him a pension of £200 per annum. He died in June, 1805, in his seventy-eighth year. One of his latest works was a life of Garrick; and a translation of Sallust has appeared since his death.

MURRAIN, or GARGLE; a contagious disease among cattle, principally caused by a hot, dry season, or general putrefaction of the air, which begets an inflammation of the blood, and a swelling in the throat, that soon proves mortal. The symptoms are a hanging down and swelling of the head, abundance of gum in the eyes, rattling in the throat, a short breath, palpitation of the heart, staggering, a hot breath, and a shining tongue.

MURRAY, Lindley, author of the most useful and popular grammar of the English language, was born in the year 1745, at Swatara, near Lancaster, in the state of Pennsylvania, of Quaker parents, in the middle station of life, he received the rudiments of his education at Philadelphia, in the academy of the society of Friends. In 1753, his father removed, with his family, to New York, where Lindley was placed at a good school. At an early age he entered a counting-house, being destined for the mercantile profession; but, having been severely chastised for a breach of domestic discipline, he privately left his father's house, took up his abode in a seminary at Burlington, New Jersey, and there contracted a love of books and study. When brought back, after some time, he prevailed upon his father to procure a classical tutor for him, under whom he applied himself with diligence and success. From the precepts and example of his parents, he imbibed lasting sentiments of morality and religion. He now undertook the study of the law in the office of an eminent counsellor, the celebrated John Jay being his fellow-student. At the age of twenty-one or twenty-two, he was called to the bar, and soon obtained practice. Within two years, he married a lady, with whom he lived in the tenderest union for more than half a century. He was very successful and sedulous in his business as a lawyer, until the war broke out between Great Britain and the colonies. About that time, the decline of his health induced him to remove into the country, about forty miles from New York. In this retreat he passed four years; and, at the expiration of this time, he was driven back to the city (then in possession of the British) by the necessity of procuring funds for the subsistence of his family. The profession of the law being no longer lucrative, he turned merchant again, and accumulated property enough to enable him to retire from business, about the period of the establishment of American independence. He then purchased a beautiful country-seat, on the banks of the river Bellevue, about three miles from New York; but a severe sickness subjected him to a general debility of the muscles, for the cure of which he was induced to go, with his family, to England. He intended to remain there only two years; but the local attachments which he formed, and his bodily infirmities, detained him for the rest of his life. He bought a very pleasant estate at Holdgate, about a mile from the city of York. Here, rendered sedentary by the weakness of his muscles, he gave himself chiefly to reading and composition. His first book is entitled the Power of Religion on the Mind, &c., and appeared in 1787. It was anonymous, gained much reputation, and has passed through seventeen editions. His Grammar was first issued in 1795. It was greatly enlarged and improved in successive editions, and has not yet been surpassed or superseded. It is still, altogether, the best extant, of the English language. It was succeeded by his English Exercises and Key, intended to correspond with, and illustrate, the Grammar; abridgments of which treatises were published in 1797, and met with an extensive sale, which they still maintain. His next work was a compilation, entitled the English Reader, also extensively used. In 1802, he produced a French compilation of the same kind, entitled *Lecteur Français*, and, subsequently, an *Introduction au Lecteur Français;* and, in 1804, an English Spelling Book. He also published a Selection from Horne's Commentary on the Psalms, and the Duty and Benefits of Reading the Scriptures. His publications were lucrative, and acquired public favour, both in Great Britain and the United States. In 1809, he finished interesting Memoirs of his life, printed since his decease. He lived upwards of sixteen years from that period, a martyr to bodily infirmities and diseases, which he bore with the most exemplary fortitude and Christian serenity. He expired Feb. 16, 1826, in his eighty-first year. He had been a highly useful labourer for education, and was a man of a very amiable character.

MURRAY, William Vans, distinguished in the annals of American diplomacy and oratory, was born in Maryland about the year 1762. Having received a classical education, he went to London, after the peace of 1783, and resided there three years, as a student of law in the Temple. He published, in the British capital, a pamphlet on the Constitutions and Laws of the United States, suggested by the observations of Price, Turgot, and Mably, which was much commended. About 1785, he returned to Maryland, where he engaged in the practice of the law; but his general reputation and merits caused him to be soon called to the councils of his country. He was first elected a member of the legislature of Maryland. For upwards of six years (from 1790 to 1797), he held a seat in the house of representatives of the United States. Few of that body equalled him in eloquence, or the other qualifications of a member of a deliberative assembly. His name ranks with the most conspicuous in the legislative annals of that period. In 1797, he declined a re-election to congress, having too long neglected his private affairs. One of the last acts of general Washington, as president of the United States, was the appointment of Mr Murray as minister plenipotentiary to the Batavian republic. The minister arrived at the Hague at a crisis when abilities, zeal, and address such as his were required, to counteract the unfriendly influence of France over the Batavian government. He succeeded in preserving harmony between the American and Batavian republics; and the first advances to a reconciliation between the United States and France, were made in the intercourse of the French *chargé d'affaires*, at the Hague, with Mr Murray. Proposals being made for a direct negotiation, they were accepted by Mr Adams, then president of the United States, who appointed Mr Murray sole envoy extraordinary to the French republic, for the purpose. Afterwards, judge Ellsworth and governor Davie were associated with him. The story of this negotiation is one of the most remarkable portions of the civil history of the United States. Mr Murray assisted in making the convention, which was signed at Paris, September 30, 1800, between this country and France. He returned to his station as minister resident at the Hague, and, in December, 1801, to his country. His health being much impaired, he retired to his seat in Cambridge, on the eastern shore of Maryland. A rapid consumption of the lungs was the cause of his death, in 1803, in the forty-second year of his age. He was one of the most accomplished and gifted of American gentlemen.

MURRAY, WILLIAM. See *Mansfield, Earl of.*

MURRINE, or MURRHINE VASES (*vasa murrhina*); splendid antique vessels, which were equally distinguished for the costliness of their material, and the beauty of their execution. They were brought, by Pompey, from Asia to Rome, after his victory over Mithridates, and bore an immense price. Some antiquarians have supposed them to have been made of a mineral of the class of sardonyx or agate, or of Chinese steatite; others, of a kind of porcelain or glass. It is most probable, that there were vessels of this kind, of natural as well as artificial materials; and that, being similar in their exterior, they were easily confounded with one another, and acquired a common appellation. Of the first kind is the famous *Mantuan vase*, so called, in the museum at Brunswick; the well-known Barberini, now Portland vase (q. v.), in the possession of the duke of Portland, is a specimen of the latter kind.

MURTEN. See *Morat.*

MURVIEDRO. See *Morviedro.*

MUSÆUS, a celebrated poet of mythological antiquity, was born at Athens. Some call him the son of Eumolpus and the Moon; others, of Linus or Orpheus. He was probably called the son of Orpheus because he was his follower and pupil. He was not only a poet, but also a philosopher, and is said to have introduced religious ceremonies, according to the instructions of Orpheus, particularly into the Eleusinian and other mysteries. The ancients attribute to him many works, of which some verses only have come down to us.

A later Musæus, who probably lived four or five centuries after Christ, is the author of an erotic poem of the loves of Hero and Leander (Heinrich's edition, Hanover, 1793; Passow's, with a translation, Leipsic, 1810.)

MUSAGETES (*leader of the Muses*); an appellation of Apollo, which belongs to him as the patron and instructor of the Muses. In later times, this appellation is oftener given to Hercules, in inscriptions on gems, &c., and also by authors.

MUSAUS, JOHN CHARLES AUGUSTUS, was born at Jena, studied theology there, and was to have become a parish priest, near Eisenach, but was objected to by the peasants, because he had once danced. Richardson's Grandison was very popular at that time, and Musaus published a satirical parody, under the title of Grandison the Second, which was well received. He was afterwards master of the pages at the Weimar court, and, in 1770, appointed professor in the gymnasium at Weimar. His next production was a satire on the extravagances of the physiognomists,—Physiognomical Travels. His German Popular Tales (1782; since edited anew by Wieland and Fred. Jacobs); his *Freund Heins Erscheinungen in Holbeins Manier* (1785); and a new series of tales, under the title *Straussfedern* (of which only the first volume was from his pen), are among his productions. He died in 1787.

MUSCADINE, MUSCADEL, MUSCATEL (from the Italian *moscadello*, on account of its flavour); a kind of sweet wine. Of the Italian, the best sorts are the Syracusan, the Moscato, Giro, and Cannanao of Cagliari; the Muscat of Algheri, and Oliastra in Sardinia. The best French muscadels, are those of Rivesaltes and Lunel; after which, rank the Frontinac and the Montbabin. Cyprus and Candia also yield muscadel.

MUSCLE. (*musculus.*) The parts that are usually included under this name consist of distinct portions of flesh, susceptible of contraction and relaxation; the motions of which, in a natural and healthy state, are subject to the will; and, for this reason, they are called *voluntary* muscles. Besides these, there are other parts of the body that owe their power of contraction to their muscular fibres; thus the heart is a muscular texture, forming what is called a *hollow* muscle; and the stomach, intestines. &c., are enabled to act upon their contents, merely because they are provided with muscular fibres; these are called *involuntary* muscles, because their motions are not dependent on the will. The muscles of respiration being, in some measure, influenced by the will, are said to have a *mixed* motion. The names by which the voluntary muscles are distinguished, are founded on their size, figure, situation, use, or arrangement of their fibres, or their origin and insertion; but, besides these particular distinctions, there are certain general ones that require to be noticed. Thus, if the fibres of a muscle are placed parallel to each other, in a straight direction, they form what anatomists term a *rectilinear* muscle; if the fibres cross and intersect each other, they constitute a *compound* muscle; when the fibres are disposed in the manner of rays, a *radiated* muscle; when they are placed obliquely with respect to the tendon, like the plume of a pen, a *penniform* muscle. Muscles that act in opposition to each other are called *antagonists;* thus every extensor has a flexor for its antagonist, and *vice versa.* Muscles that concur in the same action, are termed *congeneres.* The muscles being attached to the bones, the latter may be considered as levers, that are moved in different directions by the contraction of those organs. That end of the muscle which adheres to the most fixed part is usually called the *origin;* and that which adheres to the more movable part, the *insertion* of the muscle. In almost every muscle, two kinds of fibres are distinguished; the one soft, of a red colour, sensible and irritable, called *fleshy* fibres; the other, of a firmer texture, of a white, glistening colour, insensible, without irritability, or the power of contracting, and named *tendinous* fibres. They are occasionally intermixed, but the fleshy fibres generally prevail in the *belly* or middle part of the muscle, and the tendinous ones in the extremities. If these tendinous fibres are formed into a round, slender cord, they form what is called the *tendon* of the muscle; on the other hand, if they are spread into a broad, flat surface, it is termed an *aponeurosis.* The fibres that compose the body of a muscle are disposed in *fasciculi*, or bundles, which are easily distinguishable by the naked eye; but these *fasciculi* are divided into still smaller ones; and these, again, are probably subdivisible *ad infinitum.* The most minute fibre we are able to trace seems to be somewhat plaited; these plaits, disappearing when the fibre is put upon the stretch, seem evidently to be the effect of contraction, and have probably induced some writers to assert, that the muscular fibre is twisted or spiral. A fibre is essentially composed of *fibrine* and *ozmazome* receives a great deal of blood, and, at least, one nervous filament. By chemical analysis, muscle is found to consist chiefly of fibrine, with albumen, gelatine, extractive, phosphate of soda, phosphate of ammonia, phosphate and carbonate of lime, and sulphate of potassa. Each muscle is surrounded by a thin and delicate covering of cellular membrane, which, dipping down into its substance, encloses the most minute fibres we are able to trace, connecting them to each other, lubricating them by means of the fat which its cells contain, in more or less quantity in different subjects, and serving as a support to the blood-vessels, lymphatics, and nerves, which are distributed through the muscles. The muscles owe the red colour which so particularly distinguishes their belly part, to an infinite number of arteries, which are everywhere dispersed through the whole of their reticular substance; for their fibres, after having been macerated in water, are (like all other parts of the body divested of their blood) found to be of a white colour. The veins, for the most part, accompany the arteries, but are larger and more numerous. The lymphatics are numerous, as might be expected from the great proportion of reticular substance, which is everywhere found investing the muscular fibres. The nerves are distributed in such abundance to every muscle, that the muscles of the thumb alone receive a greater proportion of nervous influence than the largest viscera. See *Muscular Motion.*

MUSCOVY. See *Russia.*

MUSCULAR MOTION. Muscular motions are of three kinds, namely, voluntary, involuntary, and mixed. The *voluntary motions* of muscles proceed from an exertion of the will: thus the mind directs the arm to be raised or depressed, the knee to be bent, the tongue to move, &c. The *involuntary motions* of muscles are performed by organs, without any attention of the mind, as the contraction and dilatation of the heart, arteries, veins, absorbents, stomach, intestines, &c. The *mixed motions* are those which are in part under the control of the will, but which ordinarily act without our being conscious of their acting; and are perceived in the muscles of respiration, the intercostals, the abdominal muscles, and the diaphragm. When a muscle acts, it becomes shorter and thicker; both its origin and insertion are drawn towards its middle. The sphincter muscles are always in action; and so likewise are antagonist muscles, even when they seem at rest. When two antagonist muscles move with equal force, the part which they are designed to move remains at rest; but if one of the antagonist muscles remains at rest, while the other acts, the part is moved towards the centre of motion. When a muscle is divided, it contracts. If a muscle be stretched to a certain extent, it contracts, and endeavours to acquire its former dimensions as soon as the stretching cause is removed. When a muscle is wounded, or otherwise irritated, it contracts independently of the will: this power is called *irritability*, and it is a property peculiar to, and inherent in the muscles. When a muscle is stimulated, either through the medium of the will, or any foreign body, it contracts, and its contraction is greater or less in proportion as the stimulus applied is greater or less. The contraction of muscles is different, according to the purpose to be served by their contraction: thus the heart contracts with a jerk; the urinary bladder, slowly and uniformly. The intensity of muscular contraction, that is, the degree of power with which the fibres draw themselves together, is regulated by the action of the brain: it is generally regulated by the will, according to certain limits, which are different in different individuals. A particular organization of the muscles is favourable to the intensity of their contraction: this organization is a considerable volume of fibres, strong, of a deep red, and striated transversely. The cerebral influence, and the disposition of the muscular tissue, are the two elements of the intensity of muscular contraction. A very great cerebral energy is rarely found united, in the same individual, with that disposition of the muscular fibres which is necessary to produce intense contractions: these elements are almost always in an inverse ratio. When they are united, they produce astonishing effects. Perhaps this union existed in the *athletæ* of antiquity; in our times, it is observed in certain mountebanks. The muscular power may be carried to a wonderful degree by the action of the brain alone: we know the strength of an enraged person, of maniacs, and of persons in convulsions. The will governs the duration of the contraction: it cannot be carried beyond a certain time, however it may vary in different individuals. A feeling of weariness takes place, not very great at first, but which goes on increasing until the muscle refuses contraction. To prevent this inconvenience, the motions of the body are so calculated that the muscles act in succession, the duration of each being but short: our not being able to rest long in the same position is thus explained, as an attitude which causes the contraction of a small number of muscles, can be preserved but for a very short time. The feeling of fatigue occasioned by muscular contraction soon goes off, and, in a short time, the muscles recover the power of contracting. The quickness of the contractions are, to a certain degree, subject to cerebral influence: we have a proof of this in our ordinary motions; but beyond this degree, it depends evidently on habit. In respect to the rapidity of motion, there is an immense difference between that of a man who touches a piano for the first time, and that which the same man produces after several years' practice. There is, besides, a very great difference in persons, with regard to the quickness of contractions, either in ordinary motions, or in those which depend on habit. As to the extent of the contractions, it is directed by the will; but it must necessarily depend on the length of the fibres, long fibres having a greater extent of contraction than those that are short. The will has generally a great influence on the contraction of muscles; it is not, however, indispensable: in many circumstances motions take place, not only without the participation of the will, but even contrary to it: we find very striking examples of this in the effects of habit, of the passions, and of diseases.

MUSES; goddesses of the liberal arts and sciences; originally, nymphs of inspiring fountains. Different accounts are given of their origin. There is, also, a great difference in their names and attributes. The most celebrated are the daughters of Jupiter and Mnemosyne, also called Moneta, Memoria, and Mens. Their foster-mother was Eupheme. According to Homer, they lived upon Olympus. They originated in Pieria, in Thrace; from thence they came to Bœotia, and afterwards spread over the rest of Greece. The explanation of this probably is, that the art of singing was considered as having been first cultivated in the north of Greece. At first, three muses only were known: Melete (meditation), Mneme, or Arche (memory, for the immortalizing of great deeds), and Aoide (song, for the accompaniment of story); Cicero mentions a fourth, Thelxiope (*De Natura Deorum*, iii. 21). Finally, Pierus, a Macedonian, brought nine muses to Thespia, who were considered as his daughters, and hence, according to Pausanias, called *Pieridæ* (Pierians). Others derive this name from Pieria, on Olympus, where they were first worshipped. Their names were Clio, Euterpe, Thalia, Melpomene, Terpsichore, Erato, Polyhymnia, Urania, and Calliope. The poets feign that Jupiter spent nine nights with Mnemosyne, in Pieria, and, in that period, begot the nine Muses. Immediately after their birth, they came, singing and dancing, to Olympus, where Jupiter exalted them to a divine rank. Not far from the top of Olympus is their palace, near that of the Graces, where they sing and dance. They are commonly represented as virgins, though children of the Muses are sometimes mentioned. Even Urania is called, by Eustathius, the mother of Linus. Among the adventures of the Muses, their three contests with the Sirens, the daughters of Pierus, and the old bard Thamyris, are particularly famous. The Sirens were conquered: the muses plucked the feathers from their wings, and made garlands out of them for themselves, while the Sirens flew away, ashamed, in the shape of prating magpies. When the Muses contended with them in song, the heaven, the stars, the rivers, and the sea stood still, and mount Helicon leaped for joy, and Neptune, to prevent it from mounting to the heavenly regions, despatched Pegasus, who struck his foot upon the summit of the mountain; at the song of the unfortunate Pierides, black darkness covered the fields. The bard Thamyris, who contended with them, stipulated that, should he come off victorious, each of them should yield to his embraces one night; but, should he be conquered, they might impose upon him whatever punishment they pleased. They were victorious; and, as a punishment for his audacity, deprived him of his eyes and of the art of playing upon the lyre. A certain tribe, says tradition, listened to the singing of the Muses with so much pleasure that they forgot their food, and, being on the point of perishing with hunger, were in compassion converted by the Muses into grasshoppers, who sing continually, without requiring (as it was believed) any nourishment. The customary occupation of the Muses was singing and dancing. The ancients knew nothing of the particular occupations which have, in later times, been attributed to each of their number. Calliope became the goddess of epic poetry. She was the most distinguished among the Muses, the protectress of kings, whom she endowed with eloquence and song. Clio was the goddess of history: Euterpe, of music, particularly of wind-instruments; Thalia, of comedy; Melpomene, of tragedy; Urania, of astronomy; Erato, of lyric and erotic poetry; Polyhymnia, of eloquence and mimicry; and Terpsichore, of the dance. If we translate their names, Erato signifies the *lovely*; Calliope, the *eloquent*; Euterpe, the *pleasing*; Thalia, the *joyous*, particularly at feasts; Melpomene, the *musical*; Polyhymnia, *variety of song*; Terpsichore, the *dance-loving*; and Clio, *fame*. (*See the separate articles*.) Their surnames are, for the most part, derived from their places of residence,—Helicon, Pindus, Parnassus, and the sacred fountains there (hence *Castalides*, *Pimpleides*, &c.). They are commonly represented as beautiful virgins, adorned with wreaths of palm leaves, laurel, roses, or the feathers of the Sirens. They dance in a circle, together with Apollo. (See *Museum Pio-Clementinum*, vol. 1. plates 17—28, and vol. 4. plates 14, 15.) Their worship extended from Greece to Italy: the Romans originally called them *Camœnæ*. In Rome, they had a separate temple, and a grove sacred to them. The swan, the nightingale, and the grasshopper were also sacred to them. They had a knowledge of past ages, and were invoked, by poets, at the commencement of their lays.

MUSEUM. Every collection of interesting objects, of nature or art, brought together for the instruction of the student, or the satisfaction of the curious, is called a *museum*,—a word which originally signified a grotto of the Muses, or a temple of the Muses, and which was first given in the above sense to that part of the royal palace in Alexandria, which Ptolemy Philadelphus assigned for the library. Works of the fine arts, collected in museums, cannot produce the same effect as when in the places for which they were originally intended. When the images of Hercules, Hermes, and Cupid, stood in the gymnasia; when Alcamenes' statues of Venus were half hidden by bowers and trees; when the figures of Diana, with her nymphs, were found in lonely forests; Myron's groups of the Nereides, on the sea-shore; the statues of Apollo, Bacchus, and the Muses, in the theatres; the lofty image of Jupiter, at the Olympian games; or, in more recent times, when the picture of the Virgin stood over the altar, surrounded by columns and arches,—then the works of art were in their proper places, and produced the effect for which the artist intended them. But a deluge of barbarism swept over the civilization of ancient times, and the works of ancient art were hurled from their seats. When the light of civilization again dawned upon Europe, it was natural for men to seek with avidity for the relics of ancient art; and, as the changes which had taken place in religion and in social institutions forbade the restoration of them to their old uses, they were treasured up in collections, as proofs of the existence of a perfection which mankind had long lost. But this spirit of collecting may be carried, and has been carried, to an extreme. In the last century, particularly, the governments of many countries thought themselves authorized to despoil all the provinces of the few works of art which they had preserved, and to crowd them, often without any taste, in collections, into the capital. Of late, the mode of arranging museums has been greatly improved, the works of art being disposed in situations corresponding to their character; at least, this has been the case with some museums of works of sculpture, of which the *Glyptotheca* (q v.) and the new and grand museum at Berlin are honourable examples. We find the first collections of works of art in the peristyles of ancient temples. Delphi, with its treasure chambers, divided according to the different tribes of Greece; the temple of the Samian Juno and the Palladian Acropolis at Athens were very rich in works of art, consisting of consecrated gifts, arranged with taste. The successors of Alexander accumulated all kinds of works of art in their royal seats, in order to carry them about at their triumphs in long processions. Similar was the fate of foreign works of art in ancient Rome. The captured statues were carried about like slaves; and among the Roman emperors there was more than one imitator of Nero, who ordered five hundred statues to be sent from Delphi, to ornament his "golden house." The practice of removing works of art from their original localities had therefore already begun; real museums, however, existed not as yet. The barbarians afterwards broke in upon Rome, and the works of art were involved in indiscriminate destruction. The finest marbles were used for building walls; the noblest statues were burned for lime. Hardly a single statue or picture escaped, except those which were buried under the ruins, and thus preserved by the very extent of the surrounding destruction, to kindle, in future ages, a new love for the fine arts. In the beginning of the fifteenth century, only about five antique statues of marble, and one of bronze, were known to exist in Rome. In Florence began the dawn of a new day for the fine arts, in the age of the Medici. (q. v.) Cosmo I. collected antiques, and laid the foundation of the famous Florentine museum. Other princes of Italy soon followed the example. Pope Leo X., of the family of Medici, transplanted the love of the fine arts, which distinguished his house, to Rome. The villa of the Medici, on Monte Pincio, became the place in which antique works of arts, which had been hidden where destruction had not been able to reach them, were concentred. The noble families of Rome, and, by degrees, of all Italy, were inspired with a kindred zeal, and so every where commenced excavations, in order to find ornaments for their villas and palaces. Collections of coins were first made. The family of Este made the first collection of gems. Afterwards came collections of busts; yet these, as well as statues, were used in preference as ornaments in festival halls, in gardens, and yards (*cortili*), instances of which are the *cortile* in the Belvedere, and the villas in and near Rome. The arrangement of the antiques in the nine *stanzas* of the Villa Borghese was beautiful. This, we regret to say, could not be re-established when the other works of art returned to Italy, for these antiques were bought by France, and not carried off by force. Museums now became more and more common, and works were crowded together without taste and convenience. As the erudition of the Alexandrian scholiasts, though valuable, is not of equal worth with the poetry of Homer, so museums, though certainly noble establishments, and necessary to keep alive a taste for the fine arts, are not to be compared with the living activity of art; and it is gratifying to see that the effect of museums at present is to awaken genius to original production, instead of making mere copyists of ancient creations, as was once the case, when modern art seemed to be rather a matter of erudition than the offspring of native inspiration.

The most famous museum in Italy is the museum in the Vatican, which occupies almost all the rooms of that immense palace, and includes pictures, statues, *relievi*, books, and manuscripts. The *stanze* and *loggie* contain the famous fresco pictures of Raphael. In the *cortile* are the Apollo and Laocoon, with many other of the noblest productions in which man ever expressed his love for the beautiful. Raphael's Transfiguration, his Madonna di Foligno, and most of the celebrated pictures which had been carried to Paris, were placed here after their return.—See the article *Vatican;* also the work entitled *Museo Pio-Clementino*, and the continuation of it, *Il Museo Chiaramonti*, with illustrations by Visconti and Guattani, edited by Ant. d'Este and Gaspare Capparone (Rome, 1808, fol.)

The museum at Florence (q. v.) is next in rank after the Vatican. Its greatest ornaments are the Medicean Venus and the Farnesian Hercules. The museum in Paris, at the time when all the greatest treasures of the arts of almost all ages and all countries were accumulated there, was the richest in the world. It is even now exceedingly rich. The superb Diana, the true sister of the divine Apollo Belvedere, the majestic Pallas of Villetri, and the colossal tragic muse, are its greatest ornaments. As in France galleries of pictures also are understood by the name *musée*, we must mention here the magnificent gallery of the Louvre, the greatest treasures of which, at present, are the pictures of Raphael and Leonardo, purchased by Francis I., the works of Poussin, Lebrun, Lesueur, and the pictures of the former gallery of Luxemburg, by Rubens.—See count Clarac's *Musée de Sculpture antique et moderne* (Paris, 1826, with engravings.)

Besides these, there is the *musée des monuments Français*, established by Lenoir, in 1796, with the permission of the national convention. It was begun in 1790, and opened to the public in 1791, at a time when the fury of the people, excited by existing abuses, attacked indiscriminately all monuments of the previous order of things. It was composed of [illegible]ven great saloons, chronologically disposed, so that the works of each period stood by themselves. A garden attached to the museum contained those monuments which were too large for the rooms. In 1816, this museum was broken up, and the monuments restored to their former situations. M. Molard established the *conservatoire des arts et métiers*, containing a very full collection of machines, &c. The *Jardin du Roi* contains the *musée d'histoire naturelle*, which owes so much to Buffon.

In Britain, the Oxford museum is the oldest. It was founded in 1679, and owes a great part of its treasures to Elias Ashmole, whose name it bears. The British museum, in London, is continually increasing by means of donations and purchases. Sir Richard Cotton (q. v.) laid the foundation of it by his valuable collection of manuscripts. Since that time, the government has frequently made additions to it by purchase. See *British Museum*.

No country has more museums than Germany. In Dresden are the collection of antiques, called the *Augusteum*, the greatest ornaments of which are the three female figures of Herculaneum, the gallery of pictures, with Raphael's great master-piece, the Madonna di Sisto, and Correggio's Night, and the museum of casts in gypsum, collected by Mengs. (See *Dresden*). Munich has the *Glyptotheca* (q. v.); and a similar building has lately been erected for the reception of pictures, the collection of which is considerable. Guido's Ascension of the Virgin is the most distinguished of them, and the Dusseldorf collection, and that of the brothers Boisserée, have greatly enhanced their value. Still larger and finer is the new museum at Berlin, lately finished, and containing works of sculpture, coins, gems, Egyptian monuments, &c. The buildings itself, with its fresco paintings, is a splendid work of art. In the other cities of Prussia, museums are likewise erecting. Darmstadt, Gotha, Cassel, Brunswick, Dessau, Vienna, &c., contain museums more or less distinguished. Llorente has communicated some information on the collections in Spain. That country has been too much agitated, of late, to bestow much attention on the fine arts, or collections of works of art. In Turin, an Egyptian museum, opened in 1824, contains Egyptian antiquities, obtained by Drovetti. Amad. Peyron published the *Papyri Græci Musei Taurinensis*. Milan has been growing richer every day in coins. In Brescia, a museum of antiquities was established in 1827, shortly after a temple, with many statues, had been excavated. The *museo Borbonico*, at Naples, is increased by the treasures found in the subterranean cities. The most important treasures of this museum are made known to the public at large by Niccolini's *Real Museo Borbonico*, published since 1824, in numbers. It will form sixteen volumes, and a catalogue of two volumes will contain the less important works. Niccolini gives, at the same time, information respecting the history of the excavations in Pompeii.—Respecting St Petersburg, see Hand's *Description* (Weimar, 1827, 1 vol.), and Miliotti, on the gems of that capital, Vienna, 1807). Several private collections at Petersburg, and in other places of the Russian empire, are not important. Copenhagen has valuable collections, affording interesting illustrations of northern antiquities. (See *Copenhagen*.) The Greek government, some time since, issued a decree, commanding all antiquities found in the interior to be brought to the national museum, in order to preserve them from future destruction, and also to prevent their exportation.*

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* It already consists of 1090 painted vases (of various forms and descriptions), 108 lamps, and 24 smaller statues of terra-cotta, 16 small earthen vessels, 19 glass vases, 34 alabaster vases, 137 copper utensils (comprising *pateræ*, and other sacrificial vessels), 71 stone tablets (with inscriptions), 24 statues, 14 bass-reliefs, 53 fragments of sculpture, and 339 coins and medals.

MUSHROOM. See *Fungi*.

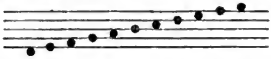
MUSIC. The Greeks understood by *music* (*μουσικη*), the (so called) arts of the Muses, particularly music in the modern sense of the word, and poetry and eloquence. Plato contradistinguishes it from *gymnastics*. The *ἀγωνες μουσικοι* (musical contests) took place in all the above arts. At a later period, the words *music* and *musical* were restricted to that art alone which strives to affect the soul by tones. We shall form a more just idea of this art if we search for its origin in our nature. We see it, as it were, daily originating, or, at least, we daily perceive in common life the germs from which it grew up. Nature seems to have established an intimate connexion between the emotions and the sense of hearing. Of the two nobler senses, sight and hearing, the first seems to belong more particularly to the understanding; we owe to the eye, and to abstractions from the images which it presents, most of our general notions and ideas, while the ear appears to be more intimately connected with the feelings. Feeling expresses itself most readily in tones. Fear, joy, desire, anger, have each a peculiar tone, understood by all human beings. Man soon perceives this, and often prolongs these tones, in order to continue or heighten a certain feeling or excitement; hence the repetition of the war-cry, in the combats of rude tribes, or of the tones of mirth at their festivities. The love of excitement, moreover, soon leads to the production of these tones, even on occasions when the feeling from which they first originated does not exist: thus we find the natural tones of joy repeated, in order to effect that of which they were originally the effect,—a pleasant feeling, a contented state of the soul. This, it is true, is not yet music or song, but the first germ of it. Another element of music, springing from a feeling deeply planted in the human heart, and perceptible in children and savages, as well as in the most refined and accomplished, soon associates itself with tones; we mean rhythm. Whatever may be its origin, whether it was first used to relieve the fatigue of a march, or to give connexion to a series of tones, or to enable numbers to join in the utterance of the same tones, or whether it is to be referred mainly to the spirit of classification and love of order, which is so universally operative,—certain it is that the love of rhythm is one of the most general principles of the human soul: it pervades all tribes, all ages, all classes. It alleviates labour, and cheers the heart. A simple division of tones soon gave rise to a more artificial one, and man soon perceived that he might utter two short tones, and make two short steps, in the same time as one long tone or one long step. Man does this long before he reflects on it: witness the regular strokes of the smith's hammer, or the thresher's flail, and the dances of the rudest nations: thus we have the two essential elements of song—tones and rhythm. As precise divisions in sciences or arts, or any of the departments of human action, grow up slowly, and kindred branches are at first usually mingled, it is highly probable that dancing and music—two arts founded on measured time—were at first intimately connected, as we find still to be the case among most, perhaps all, tribes, in a state of infancy. By degrees, the song was separated from the dance, and instruments which originally only served to accompany the song, became also the object of a separate art. Tones by themselves, apart from dance or words, were cultivated; the laws according to which they must be connected, so as best to express the language of feeling, were more and more investigated, the application of these laws further and further extended, until music was developed to that degree of perfection which we admire in the works of the greatest masters. Every musical production, to deserve the name, must be expressive of feelings, and, through them, of ideas; but though music exists wherever the human species is found, it does not follow that every good piece of music must please all men alike, or be understood by all alike, because music is an art requiring cultivation of the mind and heart, to appreciate it fully; still, however, music, even of the most elevated kind, retains so much of its character of universality, that the productions of the greatest masters delight much more generally than the best performances in other arts. Witness, for instance, certain tunes of Mozart, or other great composers, which are repeated on all occasions, so that they not unfrequently become tedious from this cause. The Hunter's Chorus in the Freischutz may be heard throughout Europe and America. The reason is, that music addresses the feelings, and feeling is alike all over the world. In this point of universality, music and mathematics (incongruous as the association may seem) agree, the relations of numbers and magnitudes, with which mathematics has to deal, being everywhere the same, and the simple feelings of the heart which music addresses being common to every region. Insensibility to music may generally be referred to a defective organization in the sense of hearing; but the whole conformation of some men is probably much better fitted than that of others to enable them to receive pleasure from it. In this respect, too, music and mathematics seem to have a resemblance, that great excellence in either seems to require a marked peculiarity in the nature of the individual. The effects of music are sometimes said to be merely sensual. It is addressed to the ear, indeed; but all the influences which we receive from without are conveyed through the medium of the senses, and the tones of music often speak a language to the soul richer in meaning than any words. It will hardly be pretended that feelings which cannot be expressed in words, are necessarily of a lower character than those which may be so expressed. The most elevated feelings are beyond the power of even metaphorical language. Nothing is merely sensual which makes a lasting spiritual impression upon the soul; and he who denies to music such a power, has not heard its sublimest strains, or has not the capacity to appreciate them. In music, we have to distinguish the invention called *composition* and the *execution*. As to the latter, it may be vocal or instrumental; and as to the purposes for which music is intended, we have *church* or *sacred* music, *theatrical* music, *concert*, *dancing*, &c., music. Music, considered on its technical side, rests on mathematics and acoustics. Since Euler, it has been understood that music ought to be treated under a mathematical point of view. It operates, in space and time, in such a way as to be susceptible of mathematical measurement. Tones, considered simply as to their duration, are magnitudes of time, which stand in a descending geometrical progression, the exponent of which is 2 : 1, $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, $\frac{1}{32}$, &c. The time is expressible in fractions ($\frac{1}{1}$, $\frac{2}{2}$, $\frac{2}{4}$, $\frac{3}{4}$, $\frac{3}{8}$ time), which indicates in numbers how many parts of the unit of time (𝅝) are contained in each bar. In space, tones can be considered as magnitudes of sound, and their distances from each other in the scale are expressed in numbers, which have reference to a mathematical division of the space between two sounds, adopted as limits (the octave, the third, seventh, &c.) Similar proportions exist between the various voices, the treble, bass, &c., and between the various keys. In instrumental music, the depth and height of the tones depend upon the proportions of the thickness, length, and lightness of the chords, the quality, diameter, and distance of the openings in wind instruments, and the like; and all these proportions can be determined and measured according to mathematical rules. This regularity may perhaps afford the reason why the effects of music are so general, and its influence on the nerves so powerful. The same circumstance renders it incapable of expressing those fine shades of feeling which can be communicated only by the aid of reflection.

When by any means the air surrounding the organ of hearing is put into an undulatory or waving motion, the drum vibrates, and these vibrations are, by the beautifully contrived apparatus of the internal ear, conveyed to the auditory nerve, and passing to the brain, occasion the sensation of sound. These undulations in the air will be followed by a perception of sound, if they affect the drum of the ear, provided they be not fewer than thirty-two, or more numerous than 8192 in the second of time: and the distinguished characteristic of musical sound is, that the vibrations which produce it are repeated at equal intervals, that is, with the same rapidity for a sensible time; a circumstance which is expressed by saying, that the sound keeps at the same pitch. Pitch and strength are very different qualities of sound. The pitch of a boy's voice is much higher than that of a man's, or the pitch of a table bell than a church bell; but the strength of each of the latter generally exceeds that of the former. The pitch of a sound depends upon the number of vibrations that the sounding body makes in a given time, the pitch being the higher, the more numerous these vibrations are. The strength of a sound, on the other hand, depends on the largeness of the waves of air. The string of a violin when touched with the bow will vibrate, and if its length or tension be not altered, its vibrations will all be at equal intervals from each other, and the sound produced, remaining at the same pitch for a sensible time, is musical. But if, whilst the string is acted upon by the bow, the finger by sliding gradually, shortens the string, the pitch of the sound will alter continually, and the sound is no longer musical. The sounds of the voice in speaking are, therefore, not musical, for although a whole sentence be pronounced in what is called a monotone, still every syllable is inflected in some degree, so that the pitch of the voice in pronouncing the word *and*, is in no case the same, at the beginning, middle, and end. If the voice remain at the same pitch during the enunciation of a single syllable, that syllable is not spoken, but sung. The most simple and convenient measure of the pitch of a sound, is a string stretched over two supports, as the string of a piano forte. The string on being struck will vibrate and produce sound, and the number of its vibrations in a given time may be regulated by three circumstances. The heavier a given portion of the string is, the less tensely it is stretched, and the greater the distance between the supports, the fewer will be the number of vibrations in a given time, and *vice versa*. For the sake of simplicity we will suppose that the weight of the string is unaltered, and that its tension remains unchanged, but that the distance between the supports can be increased or diminished at pleasure. Let the string be struck, and let the tone produced be called the *key note*, and let the length of the string, that is, the distance between the supports or bridges on which it is stretched, be measured. Let, now, one of the supports be moved, so that the length of the string shall only be one half of what it was before, and the string being made to sound, the tone produced will be higher in pitch than the key note, and will have that relation to it which musicians call an octave. With the exception of the relation of union or tones of the same pitch, no two tones could bear any more simple relation to each other than that of the key note and its octave. It is, in fact, established by nature, for when the two tones are sounded together, they almost entirely unite, and they form the limits of the musical scale. Between the key note and its octave there is a natural gradation by intervals in the pitch of tone, more agreeable than any other, the octave, as its name implies, being the eighth, the whole forming a complete scale of music, called the natural scale. The octave of the key note may be the key note of a similar scale, which will be a repetition of the first, but higher in pitch: and the two scales, if sung together, will, to an unpractised ear, appear to be identically the same. The relation of the intervals, or differences of pitch in the several tones of the natural scale, forms the fundamental part of the study of music. Their value may be determined correctly by taking the length of the strings by which they are produced. If the length of the string which produces the key note be 32 inches, the length of the strings to produce the tones in the entire scale will be

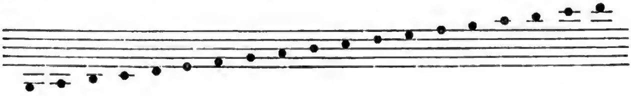
32, 30, 27, 24, 21, 20, 18, 16.

The arrangement of the tones of the scale in succession, so as to give pleasure to the hearer, forms that department of music called Melody; but if the sounds are combined, so that more than one shall be heard at once, the arrangement comes under the denomination of Harmony.

In order to represent to the eye the different pitch of the musical tones, five parallel lines are employed, called a staff or stave, and the degree of pitch is shown by certain characters placed upon these lines, or on the spaces between them, the character having a higher place on the stave which represents the tone having a higher pitch



These characters are called notes, and are of different forms; this, however, is the only one which we shall employ in the mean time, for the purpose of marking the degree of pitch of the tones. It will be seen in the stave represented above, that we have placed a note on the space below the first line, and another on the space above the fifth, and a note on each space and line intervening, so that by this arrangement we are enabled to represent the pitches of eleven notes, being one entire octave and part of another. But as one tune often comprehends tones which differ from each other in pitch even more than two octaves, an additional expedient is employed, viz. lines called ledger or added lines, placed both below and above the stave, so that we may represent tones differing in pitch to the extent of three octaves, thus:

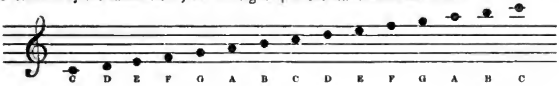


The simple scale is usually called the Diatonic, to distinguish it from other scales, in which the octave is divided into different elements. The intervals of this scale are not all equal, but are some of them nearly the double of others, the larger intervals being called full, and the smaller semi, or half tones. We say that the full tones are *nearly* double of the semi tones, but as in common musical instruments furnished with keys, the full tones are just double of the semi tones, and, as it will be conducive to simplicity, it will be best, in the mean time, to consider the interval of a full tone as *exactly* double of that of a semi tone. The notes in the octave are denoted by the first seven letters of the alphabet being employed; therefore, if C be the letter denoting the key note of the scale, we will have, C, D, E, F, G, A, B, C, representing the whole octave. The first and last notes are denoted by the same letter; for the eighth note in the scale may be regarded as the key note of a second scale, entirely similar to the first.

From the key note to the first tone above it, there is the interval of a full tone; from the second to the third is also a full tone; but from the third to the fourth there is only the interval of a semi tone. From the fourth to the fifth, from the fifth to the sixth, and from the sixth to the seventh, the intervals are all full tones; but from the seventh to the eighth the interval is a semi tone. There are thus five full tones, and two semi tones in the scale, and employing the letters before alluded to, we may represent the scale thus,

1 1 ½ 1 1 1 ½
C, D, EF, G, A, BC,

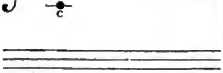
in which the spaces between the letters are small where the semi tones occur. The scale represented on the stave will stand thus:



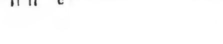
The character placed at the beginning of the stave denotes the letter G, and is placed there to show that the tone which G represents is on the second line. The note C on the ledger line below the stave is that of the middle C on the key board of the piano forte, and mathematicians have found, that to produce this note at concert pitch, there will be required 240 vibrations in the second of time. And thus the absolute pitch of this note having been determined, the pitch of all the rest is also established. To avoid the inconvenience of many ledger tones, other clefs are employed, in order to represent the pitches of notes lower than those denoted by the clef we have been considering. Let six lines be drawn below the stave on which the G clef is placed. The nature and use of these clefs will be easily understood by what follows. The tenor clef stands on the line occupied by the note middle C, the treble clef on the third line above this, and the bass clef on the third line below; and thus the pitch of each of the clefs is determined. The treble or G clef is always set upon the second, and the bass or F clef upon the fourth line of the stave. But the position of the tenor or C clef is variable, as it may be placed upon any of the lines except the fifth. This variation in the place of the C clef, however, cannot be the source of any misunderstanding as to the pitch of the notes on the stave to which it is attached, if it be borne in mind that all the lines above it belong to the treble, and all below it to the bass clef. It is denominated tenor, when on the third counter tenor. In the music of the Italian and German masters, we find the C clef placed upon the first line, the clef is then denominated soprano, and the music suits treble voices.

The various clefs are shown below on their staves, and the place of the middle C of the piano forte shown in all the staves, from which it will be easy to determine the value of the notes on each.

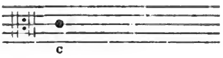
TREBLE.



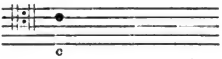
SOPRANO.



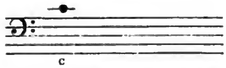
COUNTER TENOR.



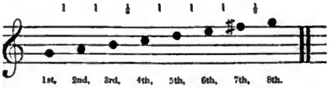
TENOR.



BASS.



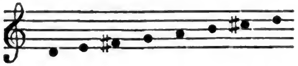
The range of a piece of music will not, however, be always such, that its key note shall be C, and at the same time come within the limits of the instrument or voice by which it is required to be performed. For instance, a melody written on the scale of C might even have some of the notes as low as G beneath the stave, in which case it would be impossible to perform it on the common German flute, which produces no note lower than D. Now, betwixt the lowest note of the melody and the lowest note which the flute can produce, there is the interval of a fifth; it will therefore be necessary to raise the air five notes before it can be brought within the compass of this instrument. If the melody be raised five notes, the key note will be no longer C but G, and we now proceed to examine how the same relation of intervals can be preserved as in the scale of D, which has been already explained. Taking then the key note G, we have



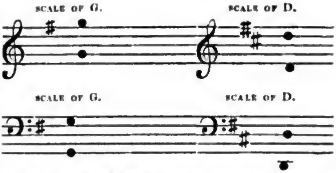
The characteristic feature of the diatonic scale is, that the intervals between the third and fourth, seventh and eighth, are semi tones, and all the rest full tones. Accordingly, in the above scale the interval from G to A ought to be one full tone, and it is so in the natural scale. The interval from A to B ought likewise to be one full tone, and it is so in the natural scale. From B to C, or from the third to the fourth, ought to be one half tone, and the interval between B and C is so in the natural scale. So likewise the intervals from the fourth to the fifth, and from the fifth to the sixth, ought all to be full tones, and the intervals from C to D, and from D to E, are full tones in the scale of C. But the interval between the sixth and seventh ought in this scale to be one full tone, whereas in the natural scale, that from E to F is only half a tone; in consequence of which the note F must be raised half a tone higher than it is in the scale of C, a circumstance which is denoted by the mark ♯ denominated a sharp, and which serves to show that the note before which it is placed ought to be played half a note higher than it would otherwise be. By the introduction of this sharp, then, the note F is raised half a tone higher than in the natural scale, and the interval from E to F is made a full tone: at the same time this sharpening of the note F has brought it in pitch only half a tone lower than the eighth note G of the scale, thus making the interval from the seventh to the eighth only half a tone, which the natural scale requires.

We have thus found that by the introduction of one sharp the whole melody may be transposed from the key of C to that of G.

If a piece of music set on the scale C did not suit the pitch of the instrument, and it is found necessary to make the key note D, we proceed to form the scale in a similar way to the foregoing. And the scale of D will stand thus:



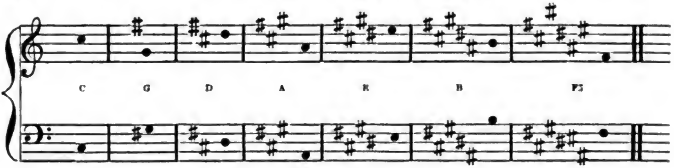
For the sake of simplicity, however, the sharp is placed at the beginning of the stave, immediately after the clef, and on that line or space on which the notes to be sharpened throughout the piece occur thus:

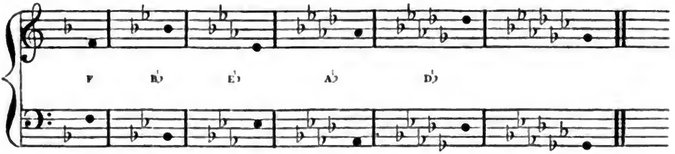


It will be found that in some instances it will be necessary to lower the pitch of a note by half a tone, which is denoted by prefixing the character ♭ called a flat, after the same manner as the sharp was employed, but with the contrary effect. This will be illustrated in the formation of the scale whose key note is F. The first two intervals from F to G, and from G to A, are full tones at the natural pitch of the notes. The third interval from A to B is a full tone in the scale of C, but the diatonic scale requires that the third interval should be a semi tone, and we must therefore reduce the pitch of B a semi tone, by prefixing the flat ♭. The interval from B to C is naturally half a tone, but the B being flattened, it has in this case become a full tone. The rest of the scale requires no alteration.

Since there are five full and two semi tones in the natural scale, there must therefore be in all twelve semitones in the octave, and this is the number of keys which constitute an entire octave in the piano forte. Now, reckoning from C, and denoting a sharp by s, and a flat by f, we have the keys C, Cs or Df, D, Ds or Ef, E, F, Fs or Gf, G, Gs or Af, A, As or Bf, B, C, each of which may be made the key note of a scale.

From this synopsis it will be easy to express any of the scales on the various clefs, but we will here confine ourselves to the treble and bass, being those which most commonly occur.





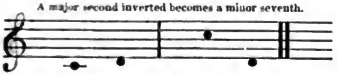
Much information may be derived from the foregoing example, and the reader is desired to give it a careful examination. It will be observed, that the scales go on gradually, from the natural scale of C, increasing in the number of sharps, to the scale of F sharp; after which the flats are introduced in a similar manner. The scales are separated from each other by upright lines, called bars, which are here used precisely in the same way as the comma in ordinary letter-press, and the double bar at the end may be regarded as a period. The treble and bass staves are connected together by a brace, and each scale in the treble clef has its corresponding scale immediately beneath it in the bass.

Before proceeding farther with our examination of the preceding example, it will be necessary to acquaint the reader with some expressions which musicians employ. From any note to the next nearest it in the scale, the interval is said to be a second. From any note to the second from it in the scale, the interval is said to be a third; and, in fact, in reckoning any interval, the two notes mentioned, together with all the notes that may lie between them in the scale, are counted thus in the natural scale of C, reckoning from the key note, we have the intervals as below.

	2d	3d	4th	5th	6th	7th	8th
C	D	E	F	G	A	B	C

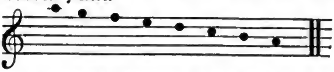
It must be evident from what has been said before, that these intervals will be of different kinds. Thus the interval from C to D is greater than that from E to F; the former being a full, and the latter a semi tone; they are both, however, intervals of a second, and to distinguish them from each other, the one is called a major, i. e. *greater* second, and the other a minor, i. e. *less*. In like manner the interval from C to E is said to be a major third, because it contains two full tones, but the interval from D to F, although a third, is said to be a minor, because it contains only one full tone and a semi tone, and so of all the other intervals. To invert an interval is to place the lower tone an octave higher, so that it becomes the more acute of the two, or *vice versa*. Thus the interval from C to D is a major second, but if we invert it by making the C an octave higher, the interval becomes a minor seventh.

A major second inverted becomes a minor seventh.



It is plain that any interval and its invertion complete the octave, and hence they are called complements of each other.

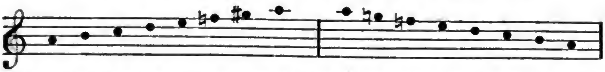
If we take the note A of the natural scale C, and all the notes of that scale until we complete an octave, that is, until we go up to the next A, we will form a scale bearing a very different character from that previously considered. If this scale be performed descending, we will find, when the octave is completed, that the succession of tones is not only agreeable, but that we have come to a satisfactory close.



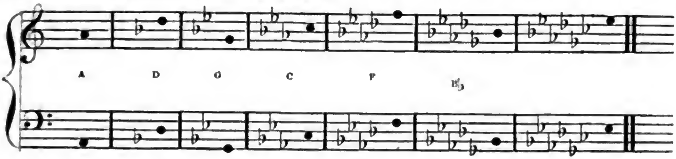
On comparing the descent through the fifth from E to A, with the descent through the fifth from G to C, we will at once perceive a marked difference in the character of the two strains; the former being plaintive and wailing, the latter cheerful and bold. This difference of character arises not from the difference of pitch of the two strains, but from the difference of relation among the intervals of which they are composed. On examining the last thirds of these strains we find the cause of this difference, for the interval from C to A (in the scale of A) is a minor third, being composed of one tone and a semi tone, while that from E to C (in the scale of C) is a major third, being composed of two full tones; the scale of C is, therefore, said to be major, and the scale of A (as above considered) minor.

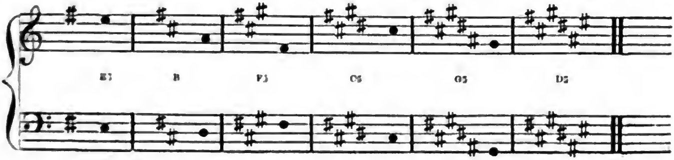
We have said that it is to the thirds principally, that we are to attribute the difference of the character of these two scales; but the minor sixth A F has also a considerable effect.

In ascending through the scale of A, we find that we are obliged to sharpen the seventh note G, so that the succession of tones may be agreeable, and in so doing we find that the interval from F to G becomes different from any of the other intervals of the diatonic scale, and we are obliged to sharpen the F also, so that the ear may be satisfied; wherefore we find that the minor scale is usually written in a different manner, ascending and descending. Thus, if the mark ♮ called a natural, denotes that the note before which it is placed is to be performed at the same pitch as in the natural scale.



Where any piece of music is written on the natural scale of A minor, we have no flats or sharps at the beginning of the stave; but employing similar principles to those that guided us in the construction of the various major scales, we may in like manner form a system of minor scales to the various key notes as below:





It is desirable that the musician should have some easy mode of determining the number and situation of the flats and sharps of every key, both in the major and minor modes, and those given in the foregoing chapter for the major scales being sufficiently simple, we will here proceed to show such a relation between these and the minor scales as will enable the student easily to determine the one from the other.

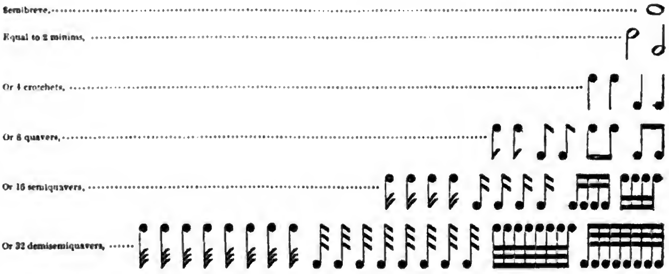
Writers on music designate the flats or sharps placed at the beginning of the clef—signatures. On comparing the minor and major keys together, we will find that the signature of

C major is the same as	A minor
F	D ......
B♭	G ......
E♭	C ......
A♭	F ......
D♭	B♭ ......
G♭	E♭ ......
G	E ......
D	B ......
A	F♯ ......
E major is the same as	C♯ ......
B	G♯ ......
F♯	D♯ ......

These are called relatives of each other, that is, A is the relative minor of C major, B minor is the relative of D major, &c., and having any major scale, it is not difficult to find the minor.

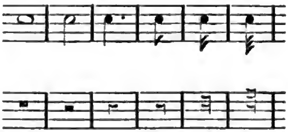
It remains for us to notice another scale, differing from those already considered, and called the Chromatic, i. e. *coloured* scaled, as it is employed by the musician to give effect to his piece, much in the same way that colour is employed by the painter. The chromatic scale proceeds by semi tones from the key note to the octave. Many new intervals arise out of this scale, which it would be out of place here to examine. For a complete development of the scales see our article *Enharmonic.*

We have stated before, that notes, by their place upon the clef, show the degree of acuteness or gravity of the tones which they represent; but besides this, they have various forms in order to show what length of time is to be occupied in performing them. The scheme below will show at one view the relative values of these notes in respect to time.



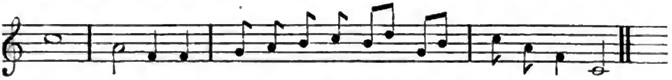
In church music we sometimes meet with a note double of the length of the semibreve, viz. the breve, marked thus 𝅜, and in some modern pieces of music which are very slow, we meet with a note 𝅘𝅥𝅱 only half the length of the demisemiquaver; but, if the semibreve be taken as the unit of measure, the minim will be one-half, the crochet one-fourth, the quaver one-eighth, the semiquaver one sixteenth, and the demisemiquaver one-thirty second. These differences in the length of notes, however minute they may appear, are insufficient for the purposes of music: accordingly, a dot is used, which being put after a note, makes it one-half longer than it would otherwise be. Thus, 𝅗𝅥· is equal to 𝅗𝅥𝅘𝅥 or to 𝅘𝅥𝅘𝅥𝅘𝅥 also 𝅘𝅥· is equal to 𝅘𝅥𝅘𝅥𝅮 or to 𝅘𝅥𝅮𝅘𝅥𝅮𝅘𝅥𝅮 and so of the rest. Some composers employ a tie ⌢ for the dot: thus 𝅗𝅥⁀𝅘𝅥 is the same as 𝅗𝅥· and 𝅘𝅥𝅘𝅥𝅮 the same as 𝅘𝅥· When the tie is employed for this purpose, the notes are always at the same pitch. In modern music a double dot frequently occurs, and in this case the note is always to be sounded as long as itself, and the next two succeeding notes in the table given above: thus 𝅗𝅥·· is equal to 𝅗𝅥𝅘𝅥𝅘𝅥𝅮 and 𝅘𝅥·· is the same as 𝅘𝅥𝅘𝅥𝅮𝅘𝅥𝅯 wherefore, by the use of the dot 𝅘𝅥·𝅘𝅥𝅮 is the same as 𝅘𝅥𝅘𝅥 and 𝅘𝅥··𝅘𝅥𝅯 as 𝅘𝅥𝅘𝅥𝅘𝅥𝅮𝅘𝅥𝅯 Sometimes three notes are to be performed in the time of two, which is marked by placing the figure 3 and a tie above them; thus $\overset{3}{\frown}$𝅘𝅥𝅮𝅘𝅥𝅮𝅘𝅥𝅮 is the same as 𝅘𝅥𝅮𝅘𝅥𝅮: notes so written are called triplets. Two triplets are sometimes joined together by one tie, and a figure 6, designating that they are to be performed in the time of four.

Sensible intervals of time often occur between the sounding of two notes, which is denoted by characters called rests, each note having a corresponding rest, thus



A dot placed after a rest makes it half as long again as it would otherwise be; thus 𝄾· is the same as 𝄾𝄿

Regular music naturally arranges itself into measures, by the occurrence of emphases, at equal intervals of time, the divisions thus arising being denoted by perpendicular lines, *bars.* The time of performing one measure must be precisely the same as that employed in performing the preceding one of the same melody, but the notes may be different in value individually, while as a whole they are the same. Thus:



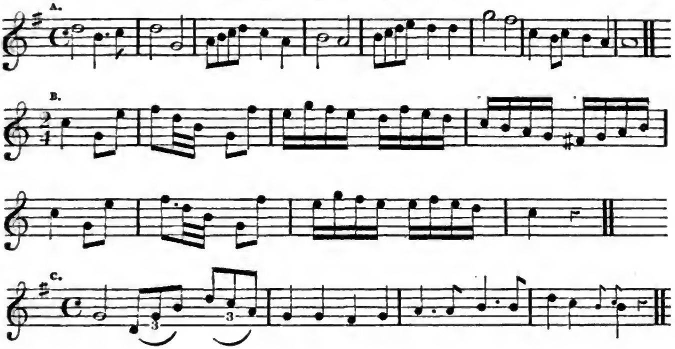
Here the measures are composed of notes of different duration, but the amount of the lengths of all the notes in one measure is the same as the amount of those of all the notes of any other; one semibreve being equal to a minim and two crotchets, or eight quavers, or two quavers a crotchet and a minim. The semibreve may be taken as the unit of measure, and the subdivisions are formed by continual bisection, i. e. dividing by two, or trisection, i. e. dividing by three, the former being called common, and the latter triple time. Of both of these kinds of time, there are various species, distinguished from each other by the recurrence of accents. The first subdivision of common time is that of two minims in the bar, denoted by placing a large C immediately after the signatures at the beginning of the piece, as may be seen in the example below (A). The next subdivision is that wherein two crotchets constitute a measure, which is signified by prefixing the fraction $\frac{2}{4}$ in the same way as was directed for the C (see B). Here the under figure denotes into how many parts the semibreve is divided, and the upper figure how many of these constitute one measure.

Four-crotchet time is accented on the first and third, and unaccented on the second and fourth. It has, therefore, a kind of close at the half of the measure, as well as at the end, in consequence of which it is not unfrequently called compound common time. It differs, however, from $\frac{2}{4}$ time only in the omission of each alternate bar, and is designated by a C, with a bar drawn through it, placed after the signatures at the beginning of the clef (see C in the example below), and it may be observed, concerning this measure, that it is commonly understood to be quicker than the other species of common time. In the following examples, from Haydn's Symphonies, it will be easy to follow the time. In the last bar of each of the examples B and C, the duration of the notes will not complete the measure, and a rest is therefore introduced, which fills up the time. In the last measure of example C, we find a mark *tr*, signifying that the note over which it is placed is to be shaken, and the two small notes immediately following are to be played quickly, and whatever time they occupy is to be taken off the succeeding note.

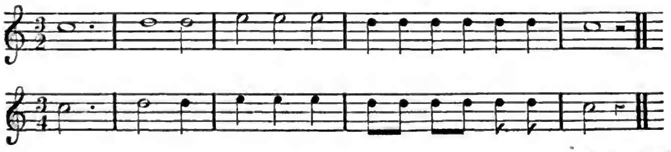
In triple time, the measure is divided into three equal parts, the first being accented, and the second unaccented, but the third, according to Colcot, is somewhat accented when compared with the second. This time is either of three minims, or three crotchets, or three quavers, which are expressed by fractions of the semibreve; the under number showing how many parts the semibreve is divided into, and the upper, how many of these parts complete a measure.

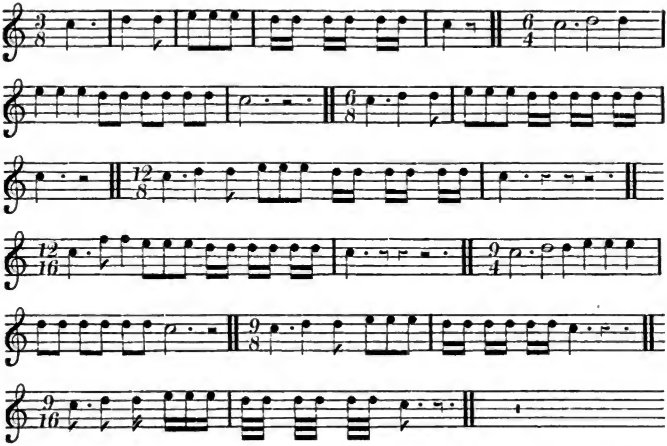
These are the principal kinds of triple measure, but compound triple measure is often formed by leaving out each alternate bar, and thus we have, $\frac{6}{2}$, $\frac{6}{4}$, $\frac{6}{8}$, or the subdivisions, $\frac{9}{4}$, $\frac{9}{8}$, $\frac{9}{16}$, $\frac{12}{4}$, or $\frac{12}{8}$, &c

EXAMPLES OF COMMON TIME.



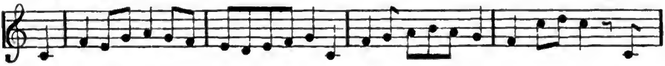
EXAMPLES OF TRIPLE TIME.



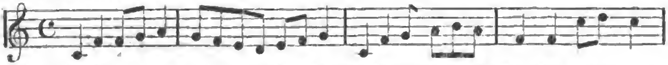


The effect of a piece of music may be varied by changing the position of the bars; this, in the case of the 'Corn Riggs,' is very happily illustrated by Dr Colcot:

Original Melody.



The same differently barred.



Melody is of two kinds, air and recitative. For the purpose of air it is necessary that the succession of sounds should be disposed into regular cadences, which is called rhythm; the notes of the piece must all belong to one key, or at least, to some other key which bears a particular relation to the principal key; and like every other piece of musical composition, air must have subject. An air must be divided into measures of equal time, of some one or other of the species described in the foregoing chapter; and several of these measures must be grouped together, which groups being distinguished by cadences; these parcels of measures forming, as it were, so many phrases, perfectly analogous to verses in poetry. A foot in music is the quantity of one measure, and if the air were always to begin at the beginning of a measure, the feet would always be enclosed by the bars, in which case there would not be any occasion to make a distinction between a foot and a measure.

Since a foot is the same length as a measure, it follows, that as there are a variety of measures, there will be a corresponding variety of feet. Two or more feet constitute a verse, and hence it will be evident that there will be greater diversity in verses, than in feet. Two or more verses constitute a strain or stanza: the former comprehending the first and second parts of our common national melodies, or pieces formed after that model; while the latter designates those phrases or pieces marked by cadences in the longer pieces of music, such as sonatas, concertos, symphonies, &c., which, however, are not marked by double bars.

The analogy between the prosody of language, and that of music, is so strong, that the terms used in the former may with advantage be employed in the latter; therefore in the one as in the other:

Verses of two feet are called dimeters,
............three ....trimeters,
............four....................tetrameters,
............five.....................pentameters,
............six ....hexameters,

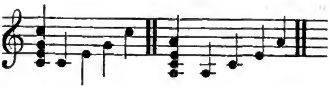
In an air there must be a principal key, which is frequently maintained throughout the whole piece, on which the tune must begin and end, and, in the course of the piece, the principal tones must bear such a relation to the key-note as to produce an agreeable effect; this is called Modulation.

We before adverted to *subject*, being a constituent of an air. Subject consists in the recurrences of the same or like phrases or turns throughout the melody; and it is subject which distinguishes the air, or indeed which gives it existence, as it shows design in the composer. In the larger pieces of music, such as sonatas, concertos, symphonies, &c., many subjects occur throughout the piece, differing more or less from each other in character, nevertheless they must all tend to bring out the general character or subject of the composition.

Sounds which differ in pitch when heard at the same time, produce an effect which is either agreeable or the contrary. When two or more sounds, heard at the same time, produce an agreeable effect, such a combination is called a chord; but if the effect be disagreeable, such combination of sounds is called a discord. A succession of chords in proper order, interspersed here and there with discords, according to certain fixed laws, constitute harmony. Any note and its unison, octave, fifth major, fifth minor, third major, third minor, sixth major, or sixth minor, will form a chord; to which list some are disposed to add the minor fourth. The following scale will show the exact quantity of the intervals used in harmony, by the numbers they contain of tones major, tones minor, and semitones, which we shall denote by T, t, S.

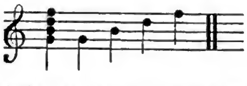
The octave contains	3 T, 2 t, 2 S
The minor second	1 S
The major seventh	3 T, 2 t, 1 S
Grave major second	1 t,
Acute minor seventh	3 T, 1 t, 2 S
Major second	1 T,
Minor seventh	2 T, 2 t, 2 S
Diminished third	2 S
Redundant Sixth	3 T, 2 t,
Redundant Second	from 1 T, and 1 t, take 1 S
Diminished seventh	2 T, 1 t, 3 S
Grave minor third	1 t, 1 S
Acute major sixth	3 T, 1 t, 1 S
Minor third	1 T, 1 S
Major sixth	2 T, 2 t, 1 S
Major third	1 T, 1 t,
Minor sixth	2 T, 1 t, 2 S
Diminished fourth	1 T, 2 S
Redundant fifth	2 T, 2 t,
Minor or perfect fourth	1 T, 1 t, 1 S
Major or perfect fifth	2 T, 1 t, 1 S
Major fourth	2 T, 1 t
Minor fifth	1 T, 1 t, 2 S

Among chords there are different degrees of agreeableness. The unison is the most perfect relation that can subsist between two sounds, and next to this is the octave. In point of perfection, next follows the major fifth; so named in contradistinction to the minor fifth, which is called imperfect. There are several technical terms employed to distinguish the tones of a piece, which it may be necessary for us here to explain, although it is our wish as much as possible to avoid the introduction of them into our pages. The *tonic*, or key note of a melody, is that tone which predominates throughout, and on which either the air itself or its bass must terminate. The dominant is a perfect fifth above the key note, and receives this name, as it is understood in some measure to govern the key note. The fifth below, or what is the same thing, the fourth above the key note, is called, for a similar reason, the subdominant. The leading note, or sharp seventh, is always a major third above the dominant; and therefore, when it occurs in the minor mode, it must be preceded by an accidental sharp, or natural. The mediant is either a major or minor third to the tonic, and the submediant is a major or minor sixth, according as the mode may be major or minor. The supertonic is the second above the key note. When any tone and its third major, or minor, together with its perfect fifth, are sounded together, the combination is called a common chord, and to this combination the octave may be added, making perfect harmony, and the name of the chord and its perfection remain unaltered, provided there be no alteration in the key note. Thus we have the chords of C major and A minor. It will be observed that the tones which constitute these chords are also agreeable in succession.



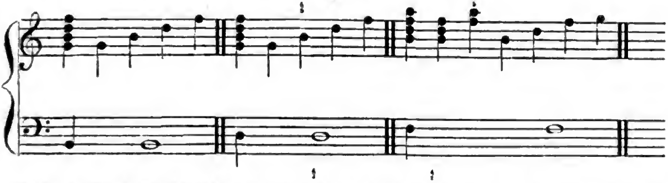
If the lowest note in the chord of C be made E, the chord then becomes what musicians call a sixth, as the key note is a sixth above it; and in like manner, had the lowest note of the chord of C been G, the chord would have been called a fourth. These two last mentioned chords are inversions of the common chord, and they have all the same fundamental note or tonic, which is called the fundamental bass, being that on which all the others are formed. The common chord is sometimes denoted by figures placed under the notes of the bass, as $\begin{smallmatrix}5\\3\\8\end{smallmatrix}$ or $\begin{smallmatrix}5\\8\\3\end{smallmatrix}$ or $\begin{smallmatrix}8\\3\\5\end{smallmatrix}$. The chord of the sixth is figured 6, and the fourth, $\begin{smallmatrix}6\\4\end{smallmatrix}$.

Before proceeding farther on the subject of chords, it will be necessary to make the reader acquainted with the nature of discords. The minor seventh is by far the most simple of discords, and may be expressed thus:



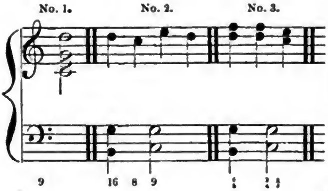
This is in the major scale of C, and the lowest note of this combination is therefore a fifth above the tonic or key note, and wherever this discord is introduced it must be so; from which circumstance it is sometimes called the *dominant* seventh. As in the case of the common chord, the position of the notes may be altered, but if B be made the bass note, i. e. the lowest, the result will be a chord, and not a discord.

Thus we have by inversion the combination consisting of a minor third and imperfect fifth, together with a sixth minor.



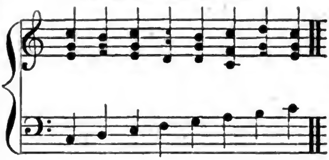
In like manner, D and F may be used as the bass notes in the foregoing combination, and chords will be the result. The three chords being figured, as shown in the examples, are all derived from the seventh, and are frequently denominated a syncopated fifth, third, or second, as the case may be.

The ninth is a discord, which is usually accompanied with the third and fifth. This is expressed in No. 1, and in a composition of four parts, it is expressed as in No. 2; yet, as in No. 3, it is frequently accompanied with a fourth and fifth, but in compositions of three parts the fifth is left out.

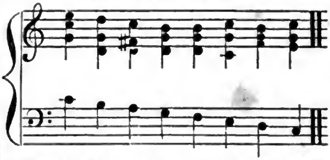


We will here exemplify what is termed the harmony of the scale, or the accompanying tones which produce harmony, with all the notes of an octave.

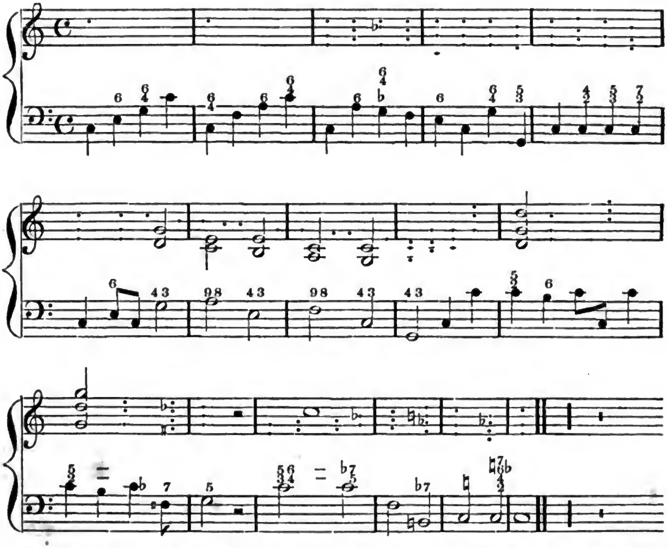
Harmony of the scale, ascending.



Harmony of the scale, descending.



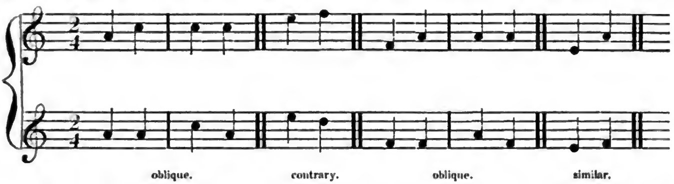
What we have now been considering may be regarded as an elementary view of the first principles of thorough or fundamental bass. The following is a synoptical view of the chords employed in the fundamental bass:



The arrangement and disposition of musical sounds into Airs, Songs, Overtures, Sonatas, &c., is denominated composition. If two parts of a piece, such as the air and bass, both ascend or descend, or remain at the same pitch during one measure, these parts are said to have a similar motion. When one part either ascends or descends while the other remains at the same pitch, the parts are said to go by oblique motion. But the parts are said to go by contrary motion, when one of them ascends while the other descends. The motion is said to be by degrees, when the interval between any tone and that next succeeding it, is not greater than a full tone; but the motion is by skips if the interval be equal to or greater than a third.

In all keys, major and minor, the following notes in the octave take the common chord as their accompaniment, viz., the key note, the fourth, fifth, and octave; but in the minor mode the fifth has a major sixth as its accompaniment; all the other notes require the uncommon chords, the seventh of the minor mode excepted, whose accompaniment is a fifth. Those melodies are the most agreeable which proceed by harmonies, and they require the fundamental bass, and next are those which proceed by small intervals. On the other hand, those melodies are least agreeable which go most by skips, to remedy which the fundamental bass is not used, but other notes are employed, which have thence received the name of supposed basses, being found extremely useful to the composer, since they serve to give variety to the harmony without destroying it, rendering the different parts more equable in their motion, and tending greatly to facilitate the singing of the air. It is usual for every composition to begin with a perfect concord of the key, that is, either octave or fifth, and it must invariably terminate on the key note with the harmony of the common chord; sometimes it may begin or end with a third. When the same note is immediately repeated in the melody, it may be considered as one long note divided into two, and in this case, but in no other, two perfect concords may follow each other; and for the purpose of preventing a repetition of concords, the parts ought to be made as much as possible to move by single degrees and contrary motion, as it is invariably accompanied with a bad effect to pass from one perfect concord to another by similar motion.

In moving from the unison to a third, it is best to take the minor, which may be either by oblique or contrary motion; but if to the major third, it is best to go by oblique rather than similar motion. This we shall illustrate by two parts on the same clef, called the arrangement of first and second, thus:



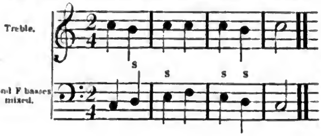
If one part move by a simple degree, motion may be made from a unison to a fifth obliquely, or even contrarily, and from the unison we may also pass to the sixth minor by contrary motion, and to the octave we may pass by oblique motion.

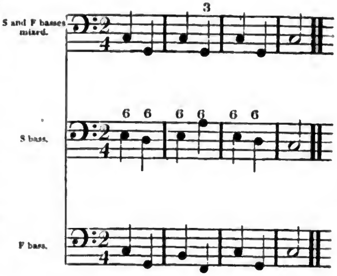
Although thirds are imperfect concords, nevertheless they are agreeable, either ascending or descending, and are therefore frequently employed. In ascending, the third major has a cheerful effect, but the contrary in descending, and the reverse holds of the third minor. When two notes of equal length follow each other, one of which is a discord (called division by supposition), minor thirds may follow each other to any extent: major thirds are not so agreeable. The latter is employed in ascending, and the former in descending, and in moving from a third to any other concord the nearest possible should be taken; and, in parts removed from the bass, replicate thirds, or thirds themselves ought to be employed. In passing from the minor third to the unison the motion ought to be oblique, but from a major third to the unison the motion ought to be similar, and by a single degree. In passing from a third to a fifth by contrary motion, the minor third ought to be preferred; and if one part move a single degree, the motion may be similar. From the major third to the fifth we pass by similar descending motion, but we may pass by oblique motion if one of the parts move by a single degree. We may go by similar or contrary motion from the third major to the sixth minor, or from the third minor to the sixth major, but the motion should be oblique when the thirds and sixths are both major or both minor. In passing from a third to the octave the movement may either be oblique or contrary, this arrangement being most effective when one part moves by a single degree; and it may be added, that when the third is minor the motion ought to be contrary, but should, if possible, be avoided.

From the fifth we may move obliquely to any other chord of the key, but although in point of perfection the fifth is next to the octave, nevertheless it ought not to be much employed except in parts near the bass. To either of the thirds, major or minor, you may move from the fifth by any of the three ways, but the oblique is best. The imperfect fifth may follow the perfect, if the third major immediately succeed in the bass, and the motion be contrary. And from the fifth to the sixth major or minor we ought to move obliquely; but in ascending, it is not allowed to pass from the fifth to the sixth minor. When motion is made from the fifth to the major sixth, and thence to the octave, such motion must be contrary, and motion ought never to be made from the fifth immediately to the octave, nor should a minor sixth ever intervene. From the major sixth we may pass immediately to the octave, but if the sixth be minor we must move to the fifth or to the unison by contrary motion, or to the fifth the motion being oblique; and from the major sixth to the fifth we also pass obliquely, but in this case a third major must follow. Sixths may follow each other by any motion, but it is better that they should be alternately major and minor, the former ascending and the latter descending; and this arrangement is especially useful where the parts move quickly and by single degrees. Motion from the minor sixth to the octave is not allowed.

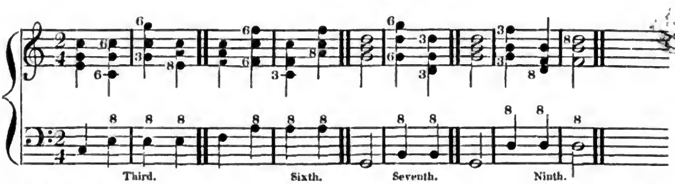
By oblique motion we may proceed from the octave to any concord whatever, with the exception of the minor third; we may pass to it, however, by any other motion; and to the unison we can only pass by oblique motion. If one part move in similar or contrary motion by a single degree, we may pass to the third major from the octave by all the three motions, and to a third minor by contrary motion. By oblique motion we may pass from an octave to a fifth, and even by the other two motions, provided one part move in a single degree. After the octave the sixth major and minor may follow by all the motions, with the exception of the former, which cannot follow by similar motion.

As was observed before, we shall confine ourselves to the consideration of the natural scales C major and A minor, which will serve to illustrate their respective modes—and first of the major scale. The fundamental basses, i. e. the key note, the fifth, and fourth, are the perfect concords of the key, and they are accompanied with their common chords; this is the real or thorough bass, but if the third, sixth, and seventh of the key are used as basses with uncommon chords, i. e. their third, sixth, and octave, such arrangement is denominated a supposed bass. The thirds of the fundamentals are their supposed basses, and may therefore be employed alone. This holds true of all the notes except the fifth of the key, which, besides its third, has also its fifth as a supposed bass. The supposed bass does not alter the harmony of the principle. The following example will illustrate what has been said on fundamental and supposed basses, where F signifies fundamental, and S supposed.





Three methods are adopted in making the accompaniment on the third and sixth of the key note; one by doubling the sixth of the supposed bass, another by doubling the third, and the last by doubling the octave; which three methods are given in the order of their preference. There are only two methods for the seventh and ninth, the one by doubling the sixth, the other by doubling the third. These are exemplified below.



The real and supposed basses which we have been considering are all derived from the perfect concords or common chord, i. e. the third, the fifth, and the octave. These real and supposed basses, however, do not afford all that variety which music requires, which defect is supplied by the bass from the uncommon chord, i. e. the chord formed by the union of the third, sixth, and eighth. This difference of the bass derived from the common chord is supplied by that derived from the uncommon; and the supposed bass is derived much in the same way, with this difference, that the supposed bass derived from the uncommon fundamental, is formed by taking minor thirds above the fundamental, whereas the supposed bass, arises from taking major thirds. The supposed bass thus formed keeps in the natural order of the key.

In the minor key the perfect concords, i. e. the unison fourth, fifth, and octave, require the common chords for an accompaniment; yet, in this scale, the tonic and fourth admit of a minor third; the fifth takes a major third, although in the scale of A it is left minor; wherefore, the third of the fifth of this mode is always sharp.

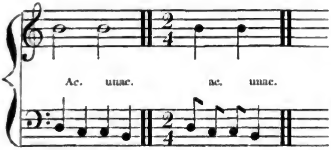
The discords and imperfect concords take as harmony the uncommon chords, but in the key of A the G must be sharpened. The second of the key has a sharp sixth, and the fourth a third, like the tonic; also, with the exception of the key of E, the fifth of the key has a third major, and the seventh a sixth minor.

What we have just been considering is what is commonly denominated plain counterpoint, that is, composition where the harmony is formed by harmonizing each note of the melody by concords. Figurate counterpoint consists in a proper arrangement of concords and discords, and admits of every thing that is capable of adorning a musical composition.

Before the student can enter on this subject, it is of the utmost consequence that he should be acquainted with the nature of the composition and resolution of discords.

A discord in harmony is the lower of two adjoining tones simultaneously sounded; and thus a second, seventh, which are the two natural discords, and the ninth is also regarded as a discord, being a replicate of the seventh, that is, an octave above; or, indeed, any note whatever may be made a discord. From this definition it will appear, that when the unison, i. e. key note, is sounded, with its second above, the unison, being the lower note, is called the discord. Discords may be prepared and resolved either in the treble or in the bass, being regarded as descending from the former to the latter, or ascending from the latter to the former.

A discord is prepared in the unaccented part of the bar by taking a chord, but the note being held on in the accented part of the bar, is sounded with its second, or what is equivalent, the replicate of the second; that is, the ninth,—becoming thus a discord, which is resolved by descending a major semitone or a full tone, and becoming a concord.



The various rules for the composition and resolution may be found in any of the larger works on music; the subject is by far too technical and abstruse for this Encyclopedia.

For the purpose of giving variety in the effect, the notes of a piece are sometimes made to occur on a different key from that on which the melody commenced. These changings of the key obey certain fixed laws which form that department of musical science denominated Modulation. In the construction of a melody keeping in the same key, the principal things to be kept in mind, are, to employ all the notes of the scale, dwelling chiefly on the necessary chords, that is, the chords of the tonic and seventh; in the repetition of which, however, a sameness of method ought to be avoided. Pauses and cadences ought to be made almost exclusively on these two chords, nor should any additional sharp or flat be added. These things are to be observed where the modulation is confined within one key, but we often pass from one key to another, a species of modulation much more extensive in its laws than the preceding, and to which we shall for a little call the reader's attention. In modulating from a major key, it will always be found best to do so from the fifth above the tonic. As to the modulations in the minor modes: from the principal key we may modulate to the third, the fifth, the fourth, and lastly, the sixth, these being given in the order of their preference. "The key of each of these accessary tones is determined by the third of the principal key." This is a general rule throughout, that the keys of the fifth and fourth of the principal key are of the same kind with that key; those of the third and sixth, on the other hand, have minor thirds. In modulation in different keys, it ought to be borne in mind that a composition ought always to begin and end in the same key; and therefore, wherever we leave the principal key for another, whether major or minor, we ought to be prepared to return with ease to it again. Moreover, since the principal key ought to predominate throughout the piece, we ought to dwell longer or shorter on the modulated keys, according to their relation to it, dwelling longer on those whose relation is the more perfect, and the converse.

The Fugue is a species of composition often employed with fine effect, especially in sacred music. It consists in a repetition of certain parts of the melody by different instruments or voices, one after the other; these repetitions being separated from each other by sensible intervals of time. In talking of fugues, it is usual to denominate the part which leads, or goes first, the *guide;* and the part which follows in the repeat, is called the *answer*. The pitch of the answer is different from that of the repeat, nevertheless, the tones and semitones of the one, must be entirely similar to those of the other. The composition of fugues is regulated by certain recognized principles, the chief of which are, that the key note and the fifth ought to be preferred for the opening and conclusion of the fugue, in which case the melody ought not to extend beyond the octave of the key; and if the guide begins or ends with the tonic, the answer ought to open and close on the fifth. Should the melody of the fugue descend from the tonic to the fifth, we may employ the sixth and seventh in the answer; and passing to the fourth, third, and second, we ought so to order the arrangement, that one of the three last notes should come near to the tonic. The fifth must always answer the tonic, and the converse, except in the middle of the air, where the fourth may be substituted; thus affording four degrees from the fourth to the tonic descending, or from the second to the fifth ascending. The bass of the fugue must first be found, then the other parts, in which it is to be remembered, that they ought to follow a similar progression in guide and answer; and if the imitation be in the treble, the bass will carry the same accompanying chords in both. The melody of a fugue should never occupy less time than half a measure, nor should it extend much beyond four measures, otherwise the movement must be rapid; and a fugue ends best on the first part of a measure, when that measure is divided into two parts; or on the third, when it is divided into four: this, however, is not without exception.

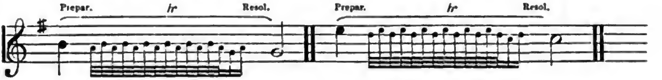
Imitation consists in a continuance of a part of the melody in the bass, or any other of the accompanying parts. This is repeated at pleasure, depending entirely on the will of the composer.

The Canon consists of an air, the subject of which is repeated in all the parts, and may therefore be regarded as a species of fugue. These repetitions are managed so as to keep within the range of the voices or instruments employed; and it is usual for them to be taken in the unison, or in the octave. The subject is first invented, and then the number of parts chosen in which the piece is to be composed, of which the melody is formed, one part serving as a prolongation of another; then the air commences in one of the parts, and when the subject is finished, it is followed in another.

We shall conclude this section by an explanation of some characters employed in musical notation.

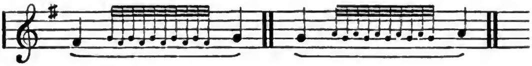
The use of the single and double bar has been already explained in treating of melody; but it is here to be observed, that when a double bar occurs with dots on each side, the part which it terminates must be again repeated. Sometimes, however, it is necessary to repeat a portion of an air, which is not terminated by a double bar, and this is denoted by placing the mark :S: above the last note in the repeat. The same thing is sometimes done by placing below the last note the letters D.C., i. e. DE CAPO, *repeat the strain*. The slur ⌒ placed over or under any number of notes, denotes that they are to be performed as if sliding into one another, that is, that the transition from the one note to the other shall be as little marked as possible. Nearly allied to the grace of slurring, is that of gliding, denoted by the mark ⌢ or ⌣, and is performed by passing from one note to another, by rising or falling from the pitch of the first to that of the second, by imperceptible degrees. This grace is easily executed on the violin, by sliding the finger gradually on the board from the stop of the one note to that of the other, while the bow continues to act on the string; and thus the first tone becomes so gradually lost and beautifully blended with the second, that the transition is almost imperceptible. The glide is frequently imitated by taking the chromatic interval between the first and last note, and this is the only way in which this grace can be at all approached on the piano forte. As was remarked on a former occasion, the figure 3 placed over three notes tied together, shows that they should be performed in the time of two; so 6 placed over six notes, shows that they ought to be performed in the time of four; and 9 placed over nine notes, shows that they ought to be performed in the time of six of the same kind. The *hold*, marked thus 𝄐, when placed over a note, shows that the performer may or ought to dwell longer on it than the time it would otherwise employ. The same mark is, however, sometimes employed to show the final ending of a piece. A grace is often employed, with excellent effect, called the *stoccata*, marked | | | | or · · · ·, placed over or under the notes, and shows that they ought to be performed with spirit, and held only half their time, the interval between each tone being filled up by an imaginary rest. This grace is executed on the violin by striking the string with the thumb instead of the bow. The mark *tr.* placed over or under any note shows that a shake ought to be performed. A simple shake is only the distinct sounding of two notes in equal motion; but a perfect shake consists of three diatonic notes, the first of which is denominated the preparatory note, and the last two the resolvents. The construction of a shake will be understood from the example below.

SIMPLE SHAKE ON A♮. PERFECT SHAKE ON D♮.

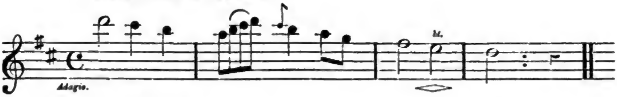


Nearly allied to the shake, is the beat, marked *bt.*, and differs from the shake in this, that the former is prepared from the note below, while the latter is prepared from the note above. This will be understood from the examples below. It only remains farther to be remarked on this subject, that at the conclusion of a slow movement, and more particularly in a solo, the beat and shake may be joined together with good effect, both having the same progressive motion, as may be seen in the undermost of the two following lines:

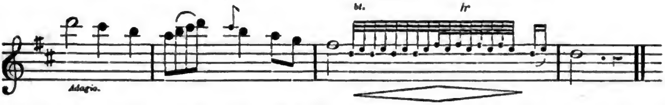
BEAT ON G♮. BEAT ON A♮.



INTRODUCTION OF THE BEAT.

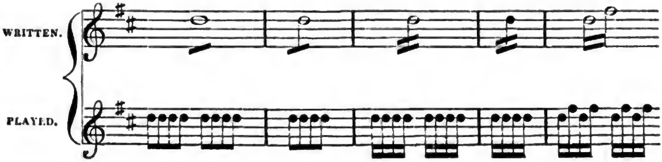


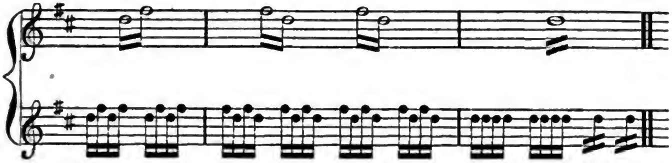
EXPLANATION.



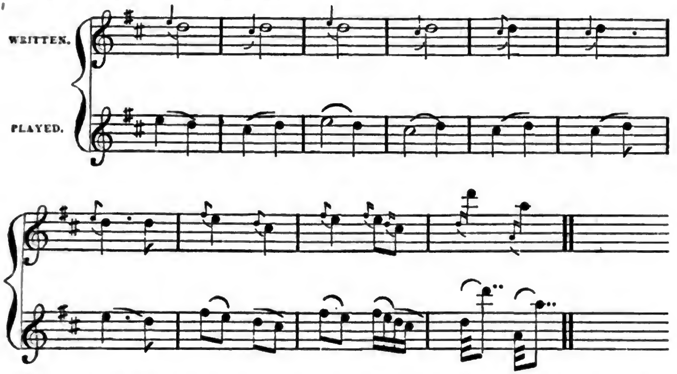
To the same class of graces belongs variation, marked thus 〰〰, denoting a tremulous motion similar to the shake, but not characterized by such distinctness, and should, therefore, as it expresses faltering, only be introduced in passages of great pathos. The mark < placed under or above a note or a parcel of notes, shows that the performer is to begin faintly, and gradually increase the strength, but not the pitch, of the tone. The mark > in like manner denotes a gradual diminution in the strength of tone. These two marks are frequently combined, forming what is called the swell <>, denoting first a gradual increase in the strength of tone, and then a gradual decrease towards the conclusion.

The marks ⁄ ⫽ are drawn through long notes to show that they ought to be formed by division, thus:

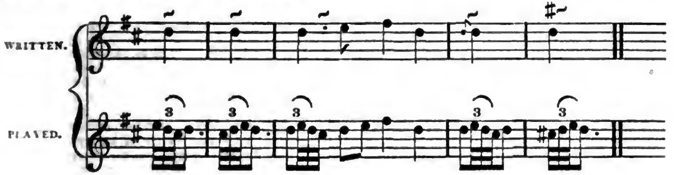




The Appogiatura is a small note placed before another, to lead it in more gracefully;—it is to be observed, that the time taken up in sounding the first note must be taken off the principal note. This grace may more frequently than any other be introduced with good effect;—the manner of its performance will be learned from the following example:



The turn marked thus ~ is an embellishment formed of appogiaturas, consisting of the note on which the turn is made, the note above and the semitone below. The method of executing the turn will be understood from what follows.



The only other character which we think it necessary to notice in this place, is the direct w; which, being placed at the end of the stave, points out the next following note.

Music, History of. In the preceding part of this article, we have given our views respecting the origin of this art. It seems to us a very poor idea to consider it as having begun with the imitation of birds or other animals, or of any of the ordinary sounds of nature; while the natural expression of emotions by sounds would easily lead to a repetition of these sounds, the consequence of which would be music. We do not deny that when once the disposition for music, or at least for the utterance of a series of tones, was awakened, the sounds of surrounding nature may have had an influence upon man, and excited him to try to form a variety of tones with his voice. Wherever we find music, even in its rudest beginnings, we find also instruments; so that, as far as respects the known history of this art, we must consider the development of vocal and instrumental music as coeval. Perhaps the first instrument invented was the pipe of the shepherd, who, in his life of leisure, heard the wind whistle among the reeds. It seems probable that shepherds first cultivated music as an art, while warriors may have made use of the exciting war-cry and war-song before. Instruments, as was observed above, served, in the beginning, only as an accompaniment. According to the Mosaic records, Jubal, the son of Lamech, played on musical instruments, even before the deluge. At a later period, we find among the Hebrews, as is the case in the early periods of all nations, the character of poet and singer united in the same individual, and with them we also find the alternating chorus. The musical instruments which accompanied these songs were harps, citherns, trumpets, and drums. One of the oldest songs, with instrumental accompaniments, is that which Miriam (sister of Moses) sung, after the passage of the Red sea. At the time of David and Solomon, music had reached its highest perfection among the Hebrews, and part of their religious service consisted in chanting solemn psalms, with instrumental accompaniment. As well as we can judge, from the information handed down to us, and even from the structure of Hebrew poetry itself, of which a certain parallelism or repetition of the main idea in the different members of a sentence was the chief characteristic, it had a very distinct rhythm, a varied melody, but a monotonous, though strong accompaniment, as was the case with the music of most ancient nations. They had also proper musical signs, which were put over the musical text, and which served to guide the recitation. (See George Ventzky's *Thoughts on the Notes, or Musical Signs, of the ancient Hebrews*, in Mitzler's Musical Library, 3d volume, in German; and Anton's *Essay towards deciphering the Melodies of the ancient Hebrew Songs*, in Paulus's New Repertory for Biblical and Oriental Literature, 1st and 2d vol., in German.) Their music, however, was employed not only in the celebration of religious service, in which, particularly since the time of David, a great number of singers, male and female, and instrumental performers, were employed, but also at profane festivals, such as large entertainments. At this time, the different kinds of instruments were increased, among which the *kinnor* (triangular harp), and the cymbal, are mentioned particularly. (See Herder, *On the Spirit of Hebrew Poetry*, 2d vol.; Pfeiffer, *On the Music of the ancient Hebrews*, Erlangen, 1779, in German.) Pauw (in his *Recherches*, vol. i. p. 244) has gone too far in asserting that the Egyptians are not known to have had either music or poetry. The tradition that Thout or Thot (the genius of science and art, according to Creuzer) invented music, proves, indeed, nothing; but, in the tomb of Osymandyas, near Thebes, musical instruments have been found, and it has been concluded that the Egyptians must have been acquainted with music 2000 years B. C. That the Hebrews received the art from them would not, however, be proved by that circumstance, though it may be, for various reasons, probable. We pass over the mythological accounts respecting the origin and perfection of the art of music among the Greeks. The traditions indicate that they received this art, or, at least, great improvements in the execution of it, from Lydia, where Amphion is said to have learned music, and Arcadia, where the shepherds practised on the pipe, flute, and cithern. From the provinces of Asia Minor, the different modes (q. v.) of Greek music—the Phrygian, Dorian, Lydian, Æolian, and Ionian—are derived. Their song, as it would appear from what we can gather from the ancient authors, consisted in a musical recitation, accompanied by one or more instruments to support the rhythm. From the sixth century B. C., music seems to have been studied scientifically, and particularly the tones were measured. Lasus of Hermione, in the Peloponnesus, who lived about 546 B. C., and was the teacher of Pindar, is said to have written something on the theory of music. Pythagoras (q. v.), who is said to have learned music from the Egyptian priests (which, however, is considered improbable), occupied himself with the mathematical relations of tones. The instrument which he invented for the mathematical determination of sounds was called the *Pythagorean canon*. He is also said to have added the eighth chord to the harp, to which several others were afterwards added. Damon is mentioned as one of the most distinguished teachers of music in the times of Pericles and Socrates. Plato asserted that his music could not be changed without changing the constitution of the state itself. Plato and Aristotle considered music useful as a means of education. In their time, the scale was considerably increased; but, at the same time, complaints arose against the degeneracy of music and of the national manners through its influence. A similar complaint was made against Phrygius, who lived in the time of Socrates. Probably the cause of it was the application of music to the expression of the more tender feelings, as love, &c., while it had been previously used chiefly to awaken patriotic or religious feeling, as with the Lacedæmonians. The division into theoretical and practical music was probably known even then. Theoretical music comprised as well the arithmetical calculations respecting the proportions of sound and tones, as the doctrine of harmony, which teaches the general rules of all the various concords. Composition and song depended upon this branch. The latter, and thus music in general, was divided, according to the proportions of the tones required in the different sorts of music, into the diatonic, enharmonic, and, at a later period, the chromatic. In regard to the tones, which were the basis of the compositions, certain modes were adopted, denominated, as has been already stated, from the countries whence they chiefly came. Music was divided, also, in respect of composition, into, 1. *melpœia* (the art of composing the song, that is, the art of giving to poetry the proper song, or mode of recitation, because the recitation, or declamation, was also indicated by notes); 2. into *rhythmopœia* (the art of giving a proper rhythm to the motion of the body or the voice); and, 3. into *poetics* (the technical part of poetry, connected intimately with music in those times): to this belonged metrics. As to execution, music was divided into *organic* (instrumental music), *œodic* (vocal music) and *hypocritic* (pantomimic action in connexion with music). At the time of Alexander the Great, Aristoxenes, a pupil of Xenophilus and Aristotle, distinguished himself. He wrote a great number of treatises on music, of which three are still extant, and extended the scale to eighteen chords, which were divided according to tetrachords and pentachords. His pupils (called the *Aristoxenians*) rejected the strict proportions of Pythagoras, and made use of the intervals of whole and half tones, guided merely by feeling. Aristoxenus also introduced the chromatic music, the invention of which belongs to this time, instead of the enharmonic. Euclid (277 B. C.) is the first writer who treated the mathematical doctrine of sounds. With the decline of liberty, music also sunk, like the other arts. But the inference drawn from the perfection of the other fine arts among the Greeks, that music had attained a corresponding advancement, is very problematical, and is not confirmed by the information which has been handed down to us. It rather appears that Greek music was not possessed of harmony in its whole fullness, and of that splendour and variety which the art attained after the perfection of instrumental music. The many stories of the miraculous effects of music prove nothing. Very simple and poor music may be considered as excellent by a nation which knows of none better: witness the glowing description of beautiful music in the tales of the East, notwithstanding the low state of the art in that quarter of the globe. The Greek song seems to have been a rhythmical recitation, with a simple accompaniment, in which the tones had less a musical than rhetorical duration. The many investigations of the moderns respecting the music of the ancients give us, on the whole, but little light on the subject, and the existing writings of the ancients themselves are, in a great degree, unintelligible, on account of the many contradictions and obscurities in them.—See the collection of the ancient musical writers by Meibom—*Antiquæ Musicæ Scriptores* (7 vols., Amsterdam, 1656, 4to). and Claud, Ptolemæus.)—Of late, Munch and Von Drieberg have written on the music of the ancients. Chladni (q. v.), however, has opposed their conclusions in many particulars, in the Musical Gazette of Leipsic. Caspar Bartholin has written on the wind-instruments of the ancients (*De Tibiis Veterum*). The Romans seem to have received the music which they used at sacrifices, together with the religious service, from the Etruscans, but the instrumental music, used on the stage and in war, from the Greeks. Stringed instruments are said to have been introduced into Rome as late as 186 B. C. In general, the Romans, so warlike in their disposition, most cultivated martial music. At an early period of their history, it was a great hinderance to the progress of the art that it was practised only by slaves. With the Romans, *canere* and *carmen* signified the musical recitation, which was accompanied by instruments, and which seems to have stood in the same relation to rhetorical recitation as the poetic *rhythmus* to the *numerus* of prose; to which we must add, however, that orators had the intonation given by instruments at the beginning of their speech and during the same. The Romans made use of their capital letters as notes. On the stage, the song was accompanied with flutes. The instruments first preluded, then the actor began; and, probably, the instrumental accompaniment continued in simple concords, or made short pauses, and supported or heightened the emphatic expression by recommencing. The choruses seem to have been accompanied differently from the monologue and dialogue. This accompaniment consisted of flutes and other wind-instruments, comprised with the Romans under the name of *tibiæ;* sometimes, also, of the lyre and cithern. The flutes were different, according to the comic or tragic poem which they had to accompany: hence there were *tibiæ dextræ* and *sinistræ*, the former particularly intended for the serious, the latter for the comic, passages, and for comedies. Horace, in his *Epistola ad Pisones*, says that, formerly, only simple wind-instruments, with a few holes, had been used; no flutes which vied with the trumpets (*tubæ*). Rhythm and melody, he says, had become less strict. At later periods, still louder complaints were raised against the noise of the instruments, which obliged the actor to raise his voice extremely. In all this, the Greeks had preceded the Romans. Under the four emperors, particularly Nero, music was cultivated as an object of luxury. After his death, 500 singers and musicians are said to have been dismissed. (For the way in which sacred music grew up among the first Christians, see the articles *Music, Sacred;* also *Italian Music*, in the article *Italy*, vol. iv., p. 188.) The solemn church song or hymn, which was first sung in one voice only, or in octaves, is the basis of modern music. It was sung without rhythm or time (in *canto fermo*). A later invention is the figured music, which, according to some, existed even in the seventh century, in the Roman church; according to others, was invented by the English monk Dunstan (who died 988). The progress of music was promoted, in the middle ages, by its being consecrated to the service of religion, and belonging to the *quadrivium*, the four branches of a learned education,—arithmetic, geometry, astronomy, and music. Several investigations into the nature of music were made, which are found in Mart. Gerbert's *Scriptores ecclesiastici de Musica Sacra.*—See, also, Forkel's *General Literature of Music* (in German, Leipsic, 1792).—Guido of Arezzo (whose works on music are also to be found in the collection just mentioned) contributed greatly to the improvement of music. The correction and extension of the system of tones, the division of tones into hexachords, the improvement in the manner of writing the notes, by the introduction of the system of lines, the invention of the *solmization* (q. v.), and of counterpoint, are generally ascribed to him. Johannes de Muris is said to have improved the mode of writing notes in the fourteenth century, and also the figured music. Franco of Cologne, in the eleventh century, is mentioned as the inventor of the musical time-table, and as the first approved writer on measured music, on which the invention of counterpoint and the fugue depended. In the fifteenth century, music was treated scientifically in the Netherlands, France, and Spain. The organ (q. v.) contributed much to the development of harmony. The Flemish school, to which belongs, among others, Orlando Lasso (q. v.), preceded Palastrina, generally called the founder of modern church music. From the sixteenth and seventeenth centuries, there grew up at the courts of monarchs the free chamber style, and, from this, the theatrical style. The invention of the opera, in the sixteenth century, has chiefly contributed to the splendour and variety of modern vocal music, and the astonishing improvement of the most various instruments greatly advanced instrumental music, and, at the same time, harmony, in the latter half of the eighteenth century. (See the history of music in the articles of the various countries.) The merit of the advancement of vocal music is claimed particularly by the Italians; the improvement of instrumental music by the Germans and French. As to the modern mathematical systems of music, Huygens, Saveur (about 1701), Rameau (about 1722) and Euler (*Mathematical Inquiries respecting Music*), deserve to be mentioned as inventors. The history of music has been treated fully by Giamb. Martini (*Storia della Musica*, Bologna, 1757 et seq.), by Marpurg (*Kritische Einleitung in die Geschichte und Grundsatze der alten und neuern Musik*, Berlin, 1759), by Burney (q. v.), from whose great work that of Busby (London, 1820, 2 vols.) was compiled, by Hawkins, and by J. N. Forkel (*Allgemeine Geschichte der Musik*, 2 vols., 4to, not finished). Von Hammer gives contributions to the history of Oriental music, from the Persian, in his *Fundgruben des Orients* (4th vol.); see, also, Pauw's *Recherches;* and, for the music of Egypt and Abyssinia, a letter by Bruce, in Burney's General History of Music.

MUSIC, Sacred. Almost all nations who have an established religious service have made music an important part of it; and, in a general sense, we might give the name of *sacred music* to all music employed in religious festivals, even before the Christian era, as that of the Egyptians, Hebrews, Greeks, and Romans, as well as to the religious songs of the bards and scalds. The early Christians, who were led by various passages in their sacred writings to employ religious songs, introduced at their religious meetings, particularly in the Eastern churches, the singing of the psalms and hymns, which are to be found in the books of the Old Testament, and to which the Jewish converts had been already accustomed in their assemblies. They sang, also, at the Lord's supper and at the agapes. At the synod of Laodicea (364), regular songs were introduced, which were sung from notes by persons appointed for this purpose. The Western churches received, through Ambrosius (q. v.), bishop of

Milan, a regular church music, similar to the Eastern. Probably this possessed a regular modulation and rhythm, only that both were defective through the imperfection of the music at that time; and the latter appears to have been limited to long and short tones: the first was founded upon the Grecian modes remaining in Italy, and was very poor. Perhaps many of the melodies of Grecian and Roman hymns now received words adapted to the religious worship of the Christians. The Christian fathers bear witness to the use of songs in the Christian communities in the first century, and many of them, as Ambrosius and Augustine, were great admirers of them. In regard to the manner of singing in the first assemblies, it was sometimes in solo, sometimes alternately, and sometimes there was a chorus of the whole assembly, who united in repeating short passages, before sung or read, from which, probably, the female sex was at first excluded. For the regular ordering of the singing, precentors were instituted in the fourth century, who were considered as inferior officers of the church. Schools appropriated to singing were instituted later, and only in a few places. Pope Gregory the Great (500—604) distinguished himself in the Roman church as the founder of a new singing-school, in which boys were instructed. It was the model of many other institutions of this kind. In consequence of this education of persons for singers, the singing was not only more artificial, but the people were also, for the most part, excluded, particularly as the hymns were in Latin. Gregory collected in his *Antiphonarium* the existing songs of the church, which he selected from the best ancient melodies, improved and increased by the addition of new ones. The *Gregorian Chant*, so called after him, was sung in unison with loud notes of similar value, without rhythm and metre (by which it is particularly distinguished from the Ambrosian), or in the old Grecian modes, but with a more complex modulation. This Gregorian or plain chant, which, by means of Gregory and his successors, has been extended throughout the West, is the foundation of the Christian church music. It was also called *choral song*, because it was sung by a choir. The Gregorian Chant was first carried into Britain and France. Charlemagne, who laboured particularly for its diffusion, caused several singing schools to be established in France, and united them with the monasteries. The Gregorian Chant was probably introduced into Germany by Boniface, but it was first generally diffused there in the time of Charlemagne. The development of the music for four voices may have been assisted by the choral; but musical instruments contributed yet more thereto, as well as to the formation of perfect harmony; among these, the organ (q. v.) particularly, which soon took the first rank in the churches. Now figured music arose, and likewise figured song (*cantus figuratus*), which, in the fifteenth century, began to become general, as the custom grew up of varying, extending, and embellishing the accompanying voices of a melody, while the chief voice, upon which the fundamental melody depended, remained unchanged (hence it was called *cantus firmus*, *canto fermo*, plain-chant); but, still, the chief voice often became the under voice. This happened afterwards, also, with melody. The invention of measured music caused the choral to be performed in a more regular measure, and gave greater extent to harmony. Choirs of singers now became necessary, and singing was often applied, especially in Italy, to heighten the splendour of religious worship. (See *Italian Music*.) The organ was continually improved, after the fifteenth century, and other instruments, also, were introduced into the church, against which complaints were often made, as well as against the new figured music in general, which found peculiar support in the instrumental music. Yet these complaints were chiefly directed against the abuse of the figured and instrumental music, and they were not able to banish them from the church. The fifteenth and sixteenth centuries form a new period of church music, which was extended by the great masters in Italy, France, the Netherlands, and Germany. Luther's services to the German church music are well known, for which he laboured, by means of his friend Senffel. During the seventeenth and eighteenth centuries, church music became continually more brilliant, and always more corrupted by the intermixture of profane music. In the Roman Catholic church, the sacred music is confined to fixed forms of text; for instance, the text of the mass, the *Offertoria*, *Te Deum*, *Salve*, Requiem, Psalms. In the Protestant church, poets and composers allow themselves new forms.—The greatest modern composers of sacred music are Palastrina, Allegri, Durante, Morales, Lolli, Scarlatti, Lasso, Caldera, Leo, Pergolesi, Handel, Bach, Graun, Hasse, Jomelli, Stolzl, Kerl, Rolle, Naumann, Schulz, Kunzen, Wolf, Mich. and Jos. Haydn, Mozart, Volger, Cherubini.

MUSIC OF THE SPHERES. See *Harmony of the Spheres*.

MUSK (*moschus*). The musk tribe have no horns. In the lower jaw they have eight incisors, and, in the upper, two long tusks, one on each side, projecting some distance from the mouth. They are celebrated from one of the species affording an odoriferous substance, which has long been used in perfumery and medicine. This substance was long known, before any authentic information could be obtained respecting the circumstances, form, and manners of the animals that produced it. The principal species is the Thibet musk (*M. moschiferus*), which is about two to three feet high. Its upper jaw is considerably longer than the lower. Its tusks are nearly two inches long, and project considerably. Its ears are long and narrow. The hair of the body is long, and stands erect; each hair is marked, from tip to root, with waves; the colour, at the lower part, is cinereous; in the middle, black; and at the tip, ferruginous. The hoofs are black, and deeply cleft. The tail is very short. The male is furnished with a small bag, nearly of the size of a hen's egg, in which is contained the musk. This hangs from the abdomen. A full grown male will yield a drachm and a half, and an old one two drachms. The bag is furnished with two small orifices, the one naked, and the other covered with hairs. The hunters cut off the bag, and tie it up for sale, but often adulterate its contents by mixing other matters with them. It has been asserted, that when the musk bag is first opened, it has a very powerful effect on the membrane of the nose, sometimes even to such a degree as to cause a flow of blood. This animal is a native of many parts of Asia, and particularly of the kingdom of Thibet. As it is naturally timid, it lives on the cliffs and summits of lofty mountains. In running, leaping, and climbing, it displays astonishing agility. Few animals lead the hunter into greater dangers, or require more address and activity in the chase. But the value of the musk induces the pursuer to brave every danger. In the autumn, however, they assemble in herds, to migrate to a more genial climate: at this time they are taken, or shot, in great numbers. The other species do not furnish any musk. These are the *meminna (M. meminna)*, a native of Java and Ceylon. It is diminutive, being not more than a foot and a half long. The Java musk (*M. Javanicus*) is also small (about the size of a rabbit), with remarkably slender legs. But the most beautiful species is the Guinea musk (*M. pygmæus*), which, notwithstanding its name, is more common in India and the Oriental Islands, than in Guinea. This graceful and diminutive creature is only about nine inches in length, with slender limbs, and smooth shining hair. The Malays capture them in great numbers, and carry them about in cages for sale. The American musk (*M. Americanus*) is only the young, or the female of one of the species of South American deer; and the *M. delicatulus* of Shaw is the fawn of the American stag.

MUSKETOON; a short thick musket, whose bore is the thirty-eighth part of its length: it carries five ounces of iron, or seven and a half of lead, with an equal quantity of powder.

MUSK OX (*ovibos moschatus*). This animal, which Mr Blainville has considered as intermediate between the sheep and ox, inhabits the barren country in America, to the northward of 60° of latitude. This district is mostly rocky, and destitute of wood, except on the banks of the larger streams. Their food is similar to that of the moose—grass at one season, and lichens at another. When they are fat, their flesh is well tasted; that of the bulls, and even of the cows, when lean, smells strongly of musk. Notwithstanding the shortness of their legs, they run fast, and can climb hills and rocks with great ease. They assemble in herds of from twenty to thirty. The female brings forth one calf in May or June. Doctor Richardson states, if the hunters keep themselves concealed when they fire upon one of the herds, the poor animals mistake the noise for thunder, and form themselves into a group, crowding closer and closer as their companions fall; but should they discover their enemies, either by sight or by their sense of smell, which is very acute, they seek for safety by instant flight. The bulls are, however, irascible, and will often attack the hunter, and endanger his life, particularly when they are wounded. The musk ox is about the size of a small domestic ox. Their horns are very broad at base, covering the forehead and crown of the head; they curve downwards between the eye and ear, until about the level of the mouth, when they turn upwards. The head is large and broad, and the nose very obtuse. The ears are short, and not very conspicuous. The general colour of the hair of the body is brown. On the neck and between the shoulders, it is long, matted, and somewhat curled: this bushy state of the hair on those parts, causes the animal to appear humped. The hair on the back and hips is also long, but lies even and smooth. On the shoulders, sides, and thighs, it is so long as to hang down below the middle of the leg. On the centre of the back it has a soiled, brownish-white mark, termed, by capt. Parry, the *saddle*. The tail is so short as to be concealed in the fur. There is a large quantity of fine, brownish, ash-coloured wool or down among the hair. This is so fine and soft as to resemble silk, and would be highly useful in the arts, if it could be procured in sufficient quantity. The legs are short and thick, and furnished with narrow hoofs, resembling those of the moose. The female, which is smaller than the male, has also smaller horns, whose bases do not touch. The first account of this animal was given by M. Jeremie, in his travels in the northern part of America, after which it was noticed by every subsequent voyager. Pennant, however, was the first who systematically arranged and described it, from the skin of a female sent to England by Hearne. As is observed by doctor Richardson, it is remarkable, among the American animals, for never having had more than one specific appellation, whilst other animals, of less interest, have been honoured with a long list of synonyms. See Richardson's *Faun. Am. Bor.* from which the foregoing account has been principally derived.

MUSK RAT (*fiber*). This well known animal, which is so closely allied in form and manners to the beaver, has a thick and blunt nose, and short ears, which are almost concealed in its fur. The colour of its body is reddish-brown; the belly and breast are of an ash-colour, slightly mixed with a ferruginous tint. The hair is soft and glossy, and beneath it is a thick coat, which is much used in the manufacture of hats. On the hinder feet, instead of the web connecting the toes, as in the beaver, there is a stiff fringe of hair, which is closely set, and projects from the sides; the front toes are free and unconnected. The tail is thin at the edges, and compressed, covered with small scales, with a few scattered hairs, is about nine inches long, or nearly that of the body, which is twelve. The flesh is not eatable from the strong odour of musk which pervades it. The musk rat is exceedingly common in most parts of the United States of America, particularly in the Northern. In Carolina, Georgia, &c., Bartram states that it is never found within one hundred miles of the sea coast. These animals reside along small streams, mill races, and ponds, apparently forming their habitations according to the nature of the locality. Where the banks have some elevation, they form large and extensive burrows, which have entrances below the surface of the water, and gradually ascend till they terminate in a chamber above the level of high water. These burrows are most frequently made under the roots of trees, or in other situations of difficult access. These excavations are of great injury to artificial embankments along canals and rivers, by permitting the water to undermine, and to make large breaches in them. When, however, these animals inhabit low and marshy situations, they construct houses not very unlike those of the beaver, composed of reeds, &c., mixed with clay. These houses have several subterraneous passages leading to them, and are inhabited by many individuals during the winter; but in the warm weather, they desert them entirely, and dwell in pairs, whilst they rear their young, of which they have from three to six at a litter. The houses are constructed in the marsh or swamp, but not in the stream or pond, and a new one erected every season. Hearne says, that the tops of these houses are favourite breeding places for the geese, which bring forth their young there, without the fear of being molested by foxes, or any other destructive animal, except the eagle. He also states, that, on Hudson's bay, instead of making their houses on the banks of the water, they build them on the ice, always taking care to leave a hole, to permit them to dive for their food. When the weather is so severe as to freeze these holes, and they suffer from hunger, there is strong reason to believe, that they prey on each other. Their usual food is the roots, &c. of aquatic plants, particularly the calamus: they also destroy immense quantities of the different species of fresh water muscles (*unio*), the shells of which are always to be seen about the entrance of their burrows. They will also feed on fruit, and one of the common baits used in traps for them, is an apple. They swim remarkably well, and are capable of remaining under water for a considerable time. They usually come forth in the night, generally remaining in the burrows during the day time. Among the traders to the north, they are known under the name of *musquash*.

MUSSCHENBROEK, PETERVAN, a celebrated natural philosopher, born at Leyden, in 1692, studied in the university of that city, and entered upon the practice of medicine. Similarity of scientific tastes united him (1717) in a close intimacy with the celebrated S'Gravesande, with whom he pursued his studies in natural philosophy. After practising his profession four years, Musschenbroek was appointed (1719) professor of philosophy and mathematics, and extraordinary professor of medicine at Duisburg, and soon acquired such a reputation that he was called (1723) to fill the philosophical and mathematical chair at Utrecht, and, in 1740, was invited to Leyden, to occupy the place left vacant by the death of Wittichius. He died there in 1761. His principal works are *Elementa Physica; Tentamina Experimentorum* (1731); *Institutiones Physicæ* (1748); *Compendium Physicæ Experimentalis* (1762). Musschenbroek rendered important services to science. His experiments and his calculations prove his sagacity and accuracy. He invented the pyrometer, which has since been improved by Lambert.

MUST; the juice of the grape, which by fermentation is converted into wine. In the wine countries this unfermented sweet must is distinguished from the sour must, or unripe wine, of a year old. Fresh must contains a good deal of sugar and mucilage, which last disposes it to fermentation. It can be kept in close vessels, after the mucilage has been precipitated.

MUSTARD (*sinapis nigra*) is a native of Europe, and is very commonly cultivated for the sake of the seeds, which, when powdered and mixed with vinegar, form a well known pungent condiment in daily use. The root is annual; the stem three or four feet high; the lower leaves are lyrate, and the upper ones lanceolate and entire; the flowers are small and yellow. It belongs to the natural family *cruciferæ*, and is known by the smooth, four-cornered pods, which are pressed close to the stem. Table mustard, mixed with warm water, and taken in considerable quantities, acts as an emetic, and, as such, is so much the more valuable from its being always at hand. The white mustard (*S. alba*) is milder than the preceding, and, on this account, is more agreeable to some palates.

MUSTER, in a military sense; a review of troops under arms, to see if they be complete and in good order; to take an account of their numbers, the condition they are in, viewing their arms and accoutrements, &c.

MUSTER ROLL; a list of the officers and men in every regiment, troop, or company, which is delivered to the inspecting field-officer, muster-master, regimental or district paymaster (as the case may be), whereby their condition is known.

MUTINY, on board of a merchant vessel, was not formerly punishable by death, in Britain; but now, by statute 11 and 12 William III., c. 7, sec. 9, made perpetual by 6 George I., c. 19, it is enacted, that any seaman or mariner, who shall, in any place where the admiral has jurisdiction, lay violent hands on his commander, whereby to hinder him from fighting in defence of the ship and goods committed to his charge, or shall confine his master, or make or endeavour to make a revolt in the ship, shall suffer pains of death, loss of lands, goods, and chattels, as pirates, felons, and robbers upon the seas have suffered and ought to suffer. Similar offences, such as the running away with the ship, or any barge, boat, ordnance, ammunition, goods, or merchandises, the yielding of them up voluntarily to pirates, the bringing of seducing messages from pirates, enemies, or rebels, the confederating with, or attempting to corrupt, any commander or mariner to yield up or run away with the ship, &c, the turning pirate, or going over to pirates, are, by the same acts, punishable in the same way. By other statutes, the wilful destruction, casting away, or burning of any ship, with intent to injure the owner, is punishable with death. In case of mutiny, the master is justified in using means sufficient to repress it; and if the death of any of the mutineers ensue, the master is justified, provided the force which he uses be fairly required by the exigency of the occasion; and the master's conduct is not to be scanned too nicely, as it must be borne in mind, that he is generally far removed from all assistance, and that his own safety and that of the ship and cargo chiefly depend upon the due maintenance of his authority. Mutiny in the royal navy is punishable under the provisions of the statute 22 George II., c. 33, which contains the rules or articles of the navy. Among the numerous offences enumerated in that statute, those which partake of the character of mutiny are as follows: the running away with the ship, or any ordnance, ammunition, or stores belonging thereto, the making or endeavouring to make any mutinous assembly, the uttering of any words of sedition or mutiny, the concealing of any traitorous or mutinous design, the striking of a superior officer, or drawing or offering to draw or lift up any weapon against him, being in the execution of his duty, on any pretence whatsoever, the presuming to quarrel with a superior officer, being in the execution of his office, or the disobeying of any lawful command of a superior officer. All the above offences are punishable with death. With regard to some, and those the least heinous of them, the court martial has a discretionary power of awarding a less punishment. The behaving with contempt towards a superior officer, being in the execution of his office, the concealing of traitorous or mutinous words spoken by any, to the prejudice of his majesty or government, or the concealing of any words, practice, or design, tending to the hinderance of the service, and not revealing the same to the commanding officer, and the endeavouring to make a disturbance on account of the unwholesomeness of the victuals, or on any other ground, are punishable with such punishment as a court-martial shall think fit to award. Mutiny in the army is punishable under the mutiny act. By this act the king is empowered to make articles of war; i. e., rules or orders for the better government of the army. The mutiny act provides that no offence shall be made punishable with death, except those which are specified therein. These are, mutiny and sedition; not endeavouring to suppress the same; not giving information of the same to the commanding officer; misbehaviour before the enemy; shamefully abandoning or giving up a post; compelling the commanding officer so to do; leaving one's post before relieved; being found sleeping on one's post; holding correspondence with any rebel or enemy; entering into terms with the same, without the license of his majesty or of the commanding officer; striking or using violence towards a superior officer, being in the execution of his duty; disobeying any lawful command of a superior officer; and deserting. The laws of the United States of America, for the punishment of mutiny in the army and navy, and on board merchant ships, are very similar to those of Britain.

MUTIS, Joseph Celestino, a celebrated botanist, born at Cadiz, in 1732, was assistant professor of anatomy at Madrid, and made botany the particular object of his attention. Having accompanied the viceroy don Pedro Mesia de la Cerda to New Grenada, in the capacity of his physician, Mutis enriched his favourite science with the description of unknown plants in that region. We are indebted to him for the first accurate accounts of various sorts of cinchona, on which he published a treatise. He died in 1808. His Flora of Bogota, left unfinished at the time of his death, was completed by his nephew.

MUTUAL INSTRUCTION is the name given to that arrangement of schools by which the more able scholars in every class assist and superintend their fellow pupils. This name, which originated in France, is not appropriate, as mutual instruction does not, in fact, take place, but some of the most distinguished scholars occupy the place of the master, while the less able do not in turn instruct them. The origin of this system may be traced to India, where the traveller Della Valle found it established as early as the sixteenth century. The object of this system is to carry on schools chiefly by means of the scholars themselves, and to instruct an uncommon number of pupils at once (Lancaster had 880 together, and says that he could teach 1000), with comparatively few masters and little expense. The pupils are divided into small classes, each instructed by one of the more advanced scholars, in reading, writing, arithmetic, &c., as far as the little teacher has been taught previously by the master. Such little teachers are called *monitors*, and have a class of about ten on a bench, or, as Bell prefers, standing in a semicircle. The oldest and most trustworthy pupils have the superintendence as general monitors. Other assistants take care of the lower departments of service, or the police of the school; one notes down the absent, one rules the writing-books, attends to the distribution of slates, &c. The strictest discipline and order being observed, the whole appears like a great piece of clock-work, which moves without the interference of one part with another. The school resembles an army, which a single man is enabled to command by means of order and discipline, and because every one knows precisely his duty. All are instructed, and teachers are formed at the same time. Cheapness is always kept in view. The pupils commence learning writing by making figures on tables covered with sand; then old paper, written or printed on one side, is taken. In England, where this system was first introduced from India, 500,000 (in London alone, 8000, in forty-three schools), in Ireland, 30,000 children, are educated according to this method, which has been greatly improved of late years. Lancaster was engaged, in 1824, in establishing similar schools under the protection of Bolivar, in the South American republic Colombia. In the British East Indies, a society at Calcutta has established eighty-eight schools on his plan, which has been also adopted at Malta, the cape of Good Hope, on the Senegal, in Sierra Leone, and other English colonies. The Greeks also have made use of this means for the establishment of elementary schools (in which they were entirely deficient), on a cheap plan, at Athens, Argos, and on the islands. From France, an interest for them was excited in Italy, where Tuscany and Parma (the latter since 1822) have permitted their establishment. In Naples and in Spain, where similar schools were established under the cortes of 1821 and 1822, in the principal towns, they were prohibited in 1823. France had, in 1821, as many as 1197 schools for children, and 166 regimental schools, according to this system. The latter were compelled, under the Bourbons, to renounce this method entirely, and the constant opposition of the ecclesiastics and the ministry lessened the number of the former, it being considered dangerous, and savouring of liberalism, to keep on foot such an institution for the improvement of the nation, in a country, where, amongst 24,000,000 of adults, only 9,000,000 could write and read, and of 6,000,000 of children, only 1,600,000 enjoyed the benefit of school education. From a similar cause, this system was prohibited in the Austrian army and throughout Austria; and, in Russia, the zeal with which it was at first received soon abated, so that only attempts on a very small scale were allowed. The Danish government, on the contrary, began, in 1819, with great zeal and success, to introduce these schools in Denmark, Holstein, and Sleswick. The plan, though not the same in all particulars, resembles, in its chief traits, that of Bell and Lancaster. The number of schools in that country has rapidly increased, and, according to a late report, amounted, in 1829, to 2646. Professor Schuhmacher, rector of the cathedral school at Sleswick, in a report on the system of mutual instruction, observes, that it is excellent, so long as it limits itself to matters of mechanical skill or of mere memory. It saves time for the teacher and pupil; it saves expense in the business of education, and is highly beneficial for all elementary schools containing a large number of pupils, differing so much in knowledge and intelligence, that one teacher cannot instruct them all at the same time, but is obliged to divide them into many classes. This method, however, is superfluous in schools in which the number of pupils is so small that the teacher can superintend and instruct them conveniently, particularly where all the members of one class have made nearly equal progress. And even in common schools, it would be injurious to strive to bring every thing into this form, as it would put a stop to the highest kind of instruction; and in the institutions for a more advanced stage of education, where a scientific spirit, independent thought, the formation of the judgment and taste, are the objects, it is more peculiarly inapplicable. Much information respecting this method in Denmark is contained in the *Progrès de l'Enseignement Mutuel en Danemark, extrait d'un Rapport au Roi, par M. d'Abramson, Major*, &c. (Copenhagen, 1825). The proper field of this system is, undoubtedly, elementary instruction. It will hardly be denied that it is of great assistance in teaching the rudiments of knowledge, reading, writing, and ciphering, besides accustoming the pupils to habits of order. It will also be admitted, at least by all who live in popular governments, that every individual ought to be taught reading and writing, without which, in the present state of the world, he is excluded from half the benefits of existence. Where, therefore, a large population is imperfectly supplied with the means of instruction, schools of this character will be of great benefit. Besides, all primary instruction must be addressed chiefly to the memory, notwithstanding learning by rote is so much decried in our day; and teachers, we imagine, might often accelerate the progress of their pupils in the branches taught in early childhood, by a more extensive application of the system of mutual instruction. The late king of Portugal established, in 1824, a central school on these principles, at Lisbon, through the instrumentality of professor Lecocq; but it has probably long since been destroyed by the violent convulsions of that unhappy country.

MYCENÆ; an ancient city of Argolis, Peloponnesus, eighty stadia from Argos, built by Perseus. It was the residence of Agamemnon, and its ruins are still seen in the state in which they were described by Pausanias. The Lions' gate, the vaulted building of enormous stones, called the *treasury of Atreus*, &c., are minutely described by Leake (*Travels in the Morea*, 1830).

MYCONI (anciently *Myconus*); an island in the department of the Northern Cyclades, in the Grecian Archipelago, about twenty-one miles in circuit; lon. 25° 23′ E.; lat. 37° 27′ N.; the population, at present, is about 4500, according to Anderson (*Observations*, &c., 1830). They are Greek Christians, and distinguished navigators. The chief town, Myconi, a seaport, contains about 4000 inhabitants. The soil is dry and mountainous, but the mountains are not very high. It produces little wheat, but plenty of barley, raisins, and figs, with some olives. Partridges, quails, turtle-doves, beccaficos, and rabbits, are in the greatest plenty.

MYLITTA; the Venus of the Assyrians (with the Arabians, *Alitta*, and with the Persians, *Mythra*). She was, as goddess of the moon, the female principle of generation. Among the licentious Babylonians, it was the custom for every woman to prostitute herself once to a stranger for a certain sum of money, in the temple of Venus Mylitta. The money was deposited by the woman in the treasury of the temple. Herodotus relates, that the women, with wreaths on their heads, seated themselves in the porticoes of the temple, through which the strangers passed to make their selection. They dared not return home till some stranger had thrown into their lap the money, with these words, "I invoke for you the goddess Mylitta."

MYLNE, Robert; an architect of eminence, memorable as the builder of Blackfriars bridge across the Thames, which was commenced in 1760, and completed in 1770. It was the first work of the kind executed in Britain, in which arches approaching to the form of an ellipsis were substituted for semicircles, by means of which the roadway is brought much nearer to a level surface than in bridges constructed on the old plan. Mr Mylne was born in Edinburgh, in 1734, and, after receiving his education in his native city, travelled to Rome, where he resided five years; and where, in 1758, he gained the first prize of the academy of St Luke, in the first class of architecture. On returning to Britain, his plan for the contemplated Blackfriars bridge was preferred to all others, and he was employed to superintend that great public work. He also obtained the appointment of surveyor of St Paul's cathedral; and he it was who suggested the felicitous inscription on that building to the memory of Wren:—"Si monumentum quæras, circumspice" (If you inquire for his monument, look around). Among other buildings erected or altered by him, may be mentioned, Rochester cathedral, Greenwich hospital, King's Weston, Ardincaple house, and Inverary castle. He died in 1811.

MYOLOGY; the branch of anatomy relating to the muscles. See *Anatomy*.

MYOPIA. See *Short-sightedness*.

MYRIAD; ten thousand: in poetical language, it generally implies an innumerable multitude.

MYRIAPODA. This class of animals was first formed by doctor Zeach, after having been placed in different orders by various naturalists before his time. Linnæus arranged them under the apterous insects, under the general names of Iulus and Scolopendra. Fabricius placed them in his class Mitosata; Latreille, Cuvier, and Dumeril, among the insects; and Lamarck, as a division of his class Arachnides.

In their general structure, organization, and in the situation and functions of their respiratory apparatus, the Myriapoda resemble insects. These consist of two air tubes, extending longitudinally and parallel to each other, the whole length of the body, which receive and transmit the air through the medium of numerous lateral spiracles. The animals of this class have a strong resemblance to serpents, their feet being closely approximated throughout the whole extent of their body. The mandibles are bi-articulated, and immediately followed by a quadrifid piece in the form of a lip with articulated divisions resembling little feet, which, from its position, corresponds to the ligula of the Crustacea; there are then two pairs of small feet resembling large hooks; they have two short antennæ, composed of seven joints in some, and, in others, they are numerous and setaceous; their eyes are composed of a union of ocelli, although some have a distinct cornea; the stigmata are very small, consisting of eighteen or twenty annuli; they have two dentated mandibles, fitted for bruising or cutting their food, and divided transversely by a suture, and a lip without palpi, formed of united portions.

The myriapoda live and increase in size longer than insects, as two years are required to render them adult. They are found under stones, the bark of trees, &c., and frequently burrow in the earth: their food consists of vegetable substances. They are generally known by the name of *Millipedes*.

ORDER I. CHILOGNATHA.

The antennæ are filiform, and composed of seven joints; the mouth is provided with two mandibles, and the lip is divided by sutures; two or four anterior feet, united at their base, like pedipalpi; and the spiracles are indistinct.

The body of the animals composing this order is frequently cylindrical, and its covering generally crustaceous; the feet are very short, they walk slowly, and are capable of rolling themselves up into a ball. The first segment of the body is longest, and every segment has usually two pairs of feet: the antennæ are thickest towards the point, or are filiform, very short and seven-jointed; the spiracles are either concealed or indistinct.

FAMILY I. ANGUIFORMIA.

Body usually linear, covered with a solid skin, and without any anal appendages; antennæ thickest towards the end; never fewer than thirty-two feet.

Iulus subulosus. Pl. 31. fig. 17. Body snake-shaped and cylindrical; antennæ, with the second joint longer than the third; legs numerous; there is no ridge or sharp edge on the sides of the rings.

FAMILY II. PENICILLATA.

The body is oblong and membranaceous, very soft, with ridged scaly sides, and a pencil of ciliated scales at the posterior extremity; antennæ filiform, with twenty-four feet.

Polyexenus lagurus. Pl. 31. fig. 18. The antennæ are short, filiform, moniliform, and inserted under the anterior margin of the head; destitute of palpi; body soft, depressed, and with fasciculi of scales on the sides, and a pencil of ciliated scales at the posterior extremity; having twenty-four feet.

ORDER II. CHILOPODA.

The mouth is composed of two mandibles, with a small palpiform appendage, which appears as if it had been soldered in the middle, and terminating in a spoonlike process, with dentated edges; the lip is quadrifid, the two lateral divisions being the longest, and annulated transversely; body depressed, with a coriaceous, membranous, or flexible covering, and each segment provided with a pair of feet; antennæ setaceous, composed of numerous joints; spiracles distinct.

FAMILY I. INÆQUIPEDES.

Body elongated, but not worm-shaped or linear, divided below into fifteen segments, each provided with a pair of feet, and covered above with eight plates or half segments in the form of scutelli and concealing the spiracles; feet elongated, especially the last pair, with a very long and jointed tarsus; eyes large and compound.

Scutigera araneoides. Pl. 31. fig. 19. The antennæ are many-jointed and setaceous, and greatly longer than the head; mandibles two, with slender palpi adhering to the back of the internal lip; the posterior lip provided with two strong-pierced hooks; body elongated, linear; having thirty feet.

FAMILY II. ÆQUIPEDES.

Body vermiform and linear, with the segments equal both above and below; feet equal, with the exception of the two last, which are long, and form a kind of tail; eyes granulated; spiracles lateral.

Lithobius forficatus. Pl. 31. fig. 20. The stigmata are lateral; the body divided into a similar number of segments, both above and beneath, each bearing a pair of feet; the superior plates alternately longer and shorter, and overlapping each other close to the extremity; fifteen pairs of feet.

Scolopendra morsitans. Pl. 31. fig. 21. The antennæ conico-setaceous, consisting of seventeen subconic joints; mouth covered by hemispheric galeæ; exterior palpi, with a double peduncle; mandibles strong and horny; the upper lip cleft; segments of the body margined; anterior pair of feet small, the last pair being largest; eight eyes, four on each side of the head, arranged in a rhomboidal form.

MYRIORAMA (Greek, *μυριας*, ten thousand, *ὁραμα*, view); a sort of landscape kaleidoscope recently invented by Brés, of Paris, and improved by Clark, of London. It is a movable picture, capable of forming an almost endless variety of picturesque scenes, by means of several fragments or sections of landscapes on cards, which may be placed together in numberless combinations. With sixteen cards 20,922,789,888,000 changes may be made.

MYRMIDONS; a people on the southern borders of Thessaly, who accompanied Achilles to the Trojan war. They received their name from Myrmidon, a son of Jupiter and Eurymedusa, or, according to some, from their having been originally ants, *μυρμηκες*. (See *Æacus*.) The term has received the signification of a bully, ruffian, or satellite of tyranny.

MYRON; a celebrated statuary of Greece, who was peculiarly happy in imitating nature. He made a cow so much resembling life, that even bulls were deceived, and approached her as if alive, as is mentioned by many epigrams in the *Anthologia*. He flourished about 442 years before Christ.

MYRRH; a fragrant, bitter, aromatic gum resin, which is obtained from an undetermined tree in Arabia, and especially in Abyssinia. It comes to us in grains having a resinous fracture, and a slightly acrid taste. According to Pelletier, it is composed of thirty-four parts of resin and sixty-six of gum. The Abyssinian myrrh is brought from the East Indies, and the Arabian comes by the way of Turkey. It is used in a great variety of medicinal preparations.

MYRRHA; a daughter of Cinyras, king of Cyprus. She became enamoured of her father, and introduced herself into his bed unknown. She had a son by him called *Adonis*. When Cinyras was apprized of the incest he had committed, he attempted to stab his daughter, and Myrrha fled into Arabia, where she was changed into a tree called *myrrh*.

MYRTLE; a genus of plants consisting of aromatic trees or shrubs, with simple opposite leaves, which are sprinkled with pellucid glandular points, and having axillary or terminal white or rose-coloured flowers. One species, the common myrtle, is a native of the south of Europe, and other countries bordering on the Mediterranean. It has been celebrated from remote antiquity on account of its fragrance and the beauty of its evergreen foliage, and, by different nations, was consecrated to various religious purposes. Myrtle wreaths adorned the brows of bloodless victors, and were the symbol of authority for magistrates at Athens. With the moderns, it has always been a favourite ornamental plant, and is commonly cultivated in gardens both in Europe and America. Pimento or allspice is the produce of a species of myrtle inhabiting tropical America, and consists of the berries, which are collected before they are ripe, and dried in the sun. No species of myrtle, nor, indeed, of the large family *myrtaceæ* inhabits any part of the United States.

MYRTLE WAX; a concrete oil, or vegetable wax, the product of the class of plants *myrica*, more commonly known by the name of *candleberry myrtle*. There are many plants which afford a concrete oil or wax; and even the light matter which is called the *down* of fruits, and which silvers the surface of prunes and other stone fruits, Proust has shown to be wax; but the indigenous family of *myrica* affords much the greatest abundance, and, in many respects, is entitled to the attention of cultivators. "The advantageous properties that this tree appears to possess," says M. Cadet, in the *Annales de Chimie*, tome 44, "ought to have induced philosophers to make inquiry to ascertain the various properties of the vegetable, and what attention its culture might require: it has long been considered merely as an object of curiosity." The plant abounds in nearly all parts of the United States of America, distinguished into four species: viz.—1. *Gale*; 2. *Cerifera*; 3. *Caroliniensis*; 4. *Pennsylvanica*. It varies in size from four to eighteen feet, becoming taller as it extends into the warmer regions. The bush or tree has somewhat the appearance of the common myrtle (*myrtus communis*), and bears a berry of the size of the pepper-grain or coriander-seed. These grains are of a common ash-colour, containing a small, round, hard kernel, which is covered with a shining wax, that may be obtained by boiling the grains in water. Toscan, in a memoir inserted in his work entitled *L'Ami de la Nature*, gives a full account of the manner of procuring the berries, and preparing the wax. The plant itself has always been esteemed a great ornament, and much exertion and expense have been bestowed to promote its growth in the European gardens. The wax is prepared for commerce by the poor people along the northern lakes, and might, by proper attention, be rendered an important article of traffic. So much was the product of the plant valued by the king of Prussia, that the tapers made of it were reserved entirely for the sick-room of the royal household, it emitting, when burning, the most delicious and balsamic odour. It was noticed, as early as the year 1722, in a memoir of M. Alexandre, published in the History of the Academy of Sciences. Charles Louis Cadet has given an excellent account of the natural history, &c., in the *Ann. de Chimie*, already referred to; and doctor John Bostock has furnished a chemical analysis of its properties and habitudes, in Nicholson's Journal, vol. iv. It has recently been introduced to the notice of the medical public, as possessing anti-dysenteric properties, by William M. Fahnestock, M. D. See *American Journal of the Medical Sciences* (vol. ii. 1828.)

MYSIA; a country of Asia Minor, which, in the most extensive sense, comprehended all the north-western portion of the peninsula, and bordered on the Ægean, the Propontis, Bithynia, and Lydia. The coast was inhabited by Æolian Greeks, the interior by different tribes. Lampsacus, Cysicus, and Pergamus were the principal cities.

MYSORE, or MAISOOR; a principality of South India, chiefly between lat. 11° and 15° N., surrounded by the British territories subject to the presidency of Madras; about 210 miles long, and 140 broad; population in 1804, 2,171,754; families, 482,612; Mohammedan families, 17,000; Bramin families, 25,370; Lingait families, 72,627; Jain families, 2063. It consists of high table-land, elevated about 3000 feet above the level of the sea, from which rise a number of lofty hills, containing the sources of many rivers, the principal of which are the Cauvery, Toombuddra, Vedawati, Bradri, and Penar. The climate, on account of the elevation of the country, is temperate. The soil produces all the grains and vegetables of the other parts of India, and many of the fruits of Europe. The rajah is tributary to the British. The first rajah mentioned in history is Cham Raj, who began to reign in 1507. But the territories of Mysore received their most important accessions from the victories of Hyder Ali, in the middle of the eighteenth century, who, without assuming the title, exercised all the power of sovereignty. His son Tippoo Saib (q. v.) perished in defending his capital in 1799, after an unsuccessful struggle with the British, who placed a descendant of the ancient rajahs on the throne. See *East India Companies*.

MYSTAGOGUE, in the mysteries of antiquity; he who introduced the person to be initiated, also he who showed the interior of the temple. Hence *mystagogue* has been used, in modern times, for a person who pretends to deal in mysteries.

MYSTERIES were, among the Greeks, and afterwards, also, among the Romans, secret religious assemblies, which no uninitiated person was permitted to approach. They originated at a very early period. They were designed to interpret those mythological fables and religious rites, the true meaning of which it was thought expedient to conceal from the people. They were perhaps necessary in those times, in which the superstitions, the errors, and the prejudices of the people could not be openly exposed without danger to the public peace. Upon this ground they were tolerated and protected by the state. Their first and fundamental law was a profound secrecy. In all mysteries there were dramatic exhibitions, relating to the exploits of the deities, in whose honour they were celebrated. The most important Greek mysteries were, 1. the Eleusinian (described in the article *Eleusis*). 2. The Samothracian, which originated in Crete and Phrygia, and were celebrated in the former country in honour of Jupiter. From these countries they were introduced among the Thracians or Pelasgians in the island of Samothrace, and extended from thence into Greece. They were celebrated sometimes in honour of Jupiter, sometimes of Bacchus, and sometimes of Ceres. (For further information respecting the Samothracian mysteries, see *Cabiri*.) 3. The Dionysia, which were brought from Thrace to Thebes, and were very similar to the former. They were celebrated every second year. The transition of men from barbarism to civilization was likewise represented in them. The women were clothed in skins of beasts. With a spear (*thyrsus*) bound with ivy in their hands, they ascended mount Cithæron, where, after the religious ceremonies, wild dances were performed, which ended with the dispersion of the priestesses and the initiated in the neighbouring woods. They had also symbols, chiefly relating to Bacchus, who was the hero of these mysteries. These celebrations were forbidden in Thebes, even in the time of Epaminondas, and afterwards in all Greece, as prejudicial to the public peace and morals. 4. The Orphic, chiefly deserving mention as the probable foundation of the Eleusinian. 5. The mysteries of Isis (q. v.) were not in vogue in Greece, but were very popular in Italy, particularly in Rome. An excellent work upon mysteries is St Croix's *Recherches historiques et critiques sur les Mystères du Paganisme* (second edition, revised by Sylv. de Sacy, Paris, 1817, 2 vols.).

MYSTERIES, or more properly MIRACLES; a kind of rude drama, which was a favourite spectacle in the middle ages, represented at solemn festivals. The subjects were of a religious character, and the ecclesiastics were at first the performers and authors. They were called *mysteries* and *miracles*, because they taught the mysterious doctrines of Christianity, and represented the miracles of the first founders of the faith, of the saints and martyrs. (See *France, Literature of*, division *Dramatic Poetry*.) The first play of this sort, specified by name, appears to have been St Catharine, written, according to Matthew Paris, by Geoffrey, a Norman, about 1110. They sometimes lasted several days. Thus we hear of one which lasted eight days, and contained the greater part of the scripture history. The Corpus Christi, the famous Coventry mystery, begins with the creation, and ends with the judgment day. The passion of Christ, the slaughter of the innocents (in Hawkins's *Origin of the English Drama*), &c., are among the subjects represented. The *Mysteries* were superseded by the *Moralities* (q. v.).

MYTHOLOGY (from μυθος, tradition, tale, fable, and λογος). The mythology of a nation is the whole body of its traditions respecting its gods, or fabulous heroes. The mythology of the Greeks and Romans is most commonly indicated by this word, because, for a long time, it was almost the only one investigated; but, of late, attention has also been bestowed on the mythologies of other nations, as of the Hindoos, the northern tribes of early Europe, &c. Whether mythological fables are to be considered mainly as the invention of crafty priests, or allegorical expositions of truth, or gross conceptions of divine things formed by the ignorant, or as founded on historical facts, which have been varied and exaggerated by tradition, embellished by poetry, and purposely altered by cunning, they still retain their interest for the historian, to whom it is equally important to study the wide aberrations of mankind in the search for truth, as their successful attempts to attain it. Erroneous notions, which influence the belief and conduct of men for centuries, must have some broad foundation in human nature, and afford the means of tracing the progress of its gradual development. The errors of mythology have their counterpart in politics and science; and we should no more think of rejecting it, as unworthy of study, on account of its absurdities, than we should of turning from the study of the feudal system, because of its glaring inconsistency with the true principles of government. If we wish to arrive at truth, we must investigate the causes of error.

In the article *Metamorphosis*, we have spoken of the constant wish of man to explain what surrounds him, to find causes for effects. This wish, deeply implanted in our soul to raise us above brutes, and make us intelligent beings, united with the natural disposition, or, rather, necessity of all nations, in the early stages of their history, to speak symbolically; their ignorance of the causes of natural phenomena; the ever-varying reports of tradition; the peculiar fondness of some tribes for poetical embellishments; the selfish purposes to which some individuals will always turn the credulity of their brethren; but, above all, the necessity of the human heart to acknowledge and adore a supernatural power (the conception of which must be accommodated to the state of cultivation)—these causes sufficiently explain the origin of mythologies, particularly if we take into account the blending together of the traditions of different tribes, by means of migrations, &c. Independently of the illustrations which they afford of the state of morality and religion at given periods, the various mythologies are interesting on account of the historical facts which they frequently contain, though disguised by tradition, or the conclusions to which they lead, as to the connexion of different nations, at certain periods, or the contrary. As to Greek mythology, investigations have been carried on, of late, with greater zeal in Germany than in any other country; and two very distinct theories respecting it have found adherents. Creuzer, standing at the head of one party, understands by the word *mythology* "the symbolical religious poetry of the whole ancient world, which, being founded partly on a common language which nature suggests to all, partly derived from a common source, forms one inseparable whole." Godfrey Hermann, another eminent German philologist, however, considers mythology as the science that teaches what notions were the basis of particular symbols in a particular nation. In the article *Creuzer*, a somewhat fuller account of his view of mythology is given. Hermann's view is contained in his letter to Creuzer, on the Nature and Treatment of Mythology (Leipsic, 1819), which was preceded by the Letters on Homer and Hesiod, especially on the Theogony (Heidelberg, 1818). A critical analysis only can enable us to understand the nature, origin, and connexion of the mythological fables. The nature of the subject itself must determine how it is to be treated; that is to say, how the true meaning is to be found out from symbolical expressions, or distorted representations.

Greek mythology, and so that of every other nation, is a mass of various elements, though kindred in their origin, yet not forming a system. The sources of mythology are the notions which sprung up among the people, the dogmas of the priests, and the representations of those who treated of mythological subjects, without having been initiated into the religious mysteries. These three chief sources of mythology give rise to three chief periods, each requiring a peculiar treatment. The early national mythology of the Greeks is to be explained etymologico-allegorically; the doctrine of the priests, in an historico-dogmatical way; and the exoteric theory of the poets and philosophers, in a critical way. It belongs to a history of mythology to show how the cyclus of mythuses was formed by poets; how it was explained by the ancient writers on cosmogony and theogony; how it was used arbitrarily by the lyrical and tragic poets; and how it stands in close connexion with ancient history. Many treatises exist, affording rich materials for such a work. The period of the independent development of mythological fables was followed by that of the Alexandrian collectors of mythuses; and these were succeeded by sophists and rhetoricians, who tried, with little success, to solve the riddles of mythology. The polemic zeal of the fathers of the church was of greater service, and to their computations we owe the preservation of interesting mythuses. Though the labours of some scholars, previous to the time of Heyne, must be acknowledged to have thrown light on this subject, yet he deserves the honour of having first attempted, on just principles, the investigation of the meaning of the various traditions. Since Heyne and Voss, the native land of the different mythuses has been carefully investigated, and has been found in the East, where, of course, new obstacles arose; and the attempts of Kanne, Wagner, Gorres, Dornedden, Hug, Sickler, to ascertain the native soil of the mythological traditions, sometimes betray a want of accuracy and circumspection. Thus, by degrees, that theory was developed which Creuzer, in his Symbolics and Mythology, strives to establish, and which, through the great erudition and acuteness of the author, has found many adherents, viz. "that mythology is a great panorama of religious ideas and conceptions, mostly originating in the East, and conceived and developed in the Oriental fashion, from which, therefore, the symbolic, magic, and allegoric cannot be excluded, any more than from the most ancient Greek poetry." Many maintain that the whole Greek mythology leads strongly to the supposition of the pre-existence of pure monotheism. Hermann, as we have said, opposed this view, and John H. Voss and Lobek warmly attacked it; but Gorres, Von Hammer, Munter, Uwaroff, and Ritter have attempted to give new reasons for its support. For information respecting the mythology of India, and of the north of Europe, see *Indian Mythology*, and *Northern Mythology*.

MYTHOLOGY, EGYPTIAN. See *Hieroglyphics*.

MYTHOLOGY, NORTHERN. See *Northern Mythology*.

MYTILENE, or MITYLENE. See *Lesbos*.

N

N; the fourteenth letter and eleventh consonant of the English alphabet; an articulation formed by placing the point of the tongue against the root of the upper teeth, and forcing out the breath. It is a liquid or semi-vowel, because part of its articulation may be continued for any length of time. It is a nasal letter, the articulation being accompanied by a sound through the nose, caused by the position of the tongue, which forces part of the air in the expiration through that organ. It is a lingual, because produced chiefly by the above-mentioned position of the tongue, which, as the reader will see from the article *L*, is nearly the same in the pronunciation of both these letters; in consequence of which persons, who, from neglect, or natural defect, are unable to inflect the tongue, so as to pronounce *l*, often substitute an *n* instead of it. N has always something of a nasal sound, and in many languages is the strongest nasal sound; for instance, before the palatic sounds *g* and *k*, as in *finger*, *tinker*, *ring;* in French and Portuguese, after a vowel in the same syllable, as *on*, *un*, &c. For the etymologist *n* is important, on account of its ready union with other letters, and its frequent omission or insertion between other letters. The same word in the same language often has the *n*, in some of its modifications, before the palatic sounds *g* and *k*, and in others omits it. Thus the original *frago*, *tago*, *pago*, became in later Latin *frango*, *tango*, *pango*, yet *fregi*, *fractum*, *tetigi*, *tactum*, *pepigi*, *pactum*, &c., were retained. Thus also *fingere* and *figura*, *fictus*, *figmentum; stringere*, *strictus*. From the Latin *lynx*, the German forms *luchs* (the Danes *los*, the Swedes *lo*); for the German *danken* (to thank) and the Swedish *danka*, the Icelandic has *tacka:* for the Greek μεγας, the Romans had *magnus*. In the same way the Latin ending *cus* passes over into *gnus*, as *benignus*, *malignus*, *abiegnus*, &c. It often associates also with the labials *d* and *t*, while other idioms omit it in the corresponding words; thus in Latin, *scindo*, *scidi; findere*, *fidi*. In German, the *n* before *d* is extremely frequent, thus *jugend* (youth); in Low Saxon, *jögd* only; *tugend* (virtue), for the ancient *taugde; nackend* (naked) for the old *nacket;* and in *lebendig*, *wesentlich*, *ordentlich*, and a large number of other words. On the other hand, the Icelandic has for *mantel* (mantle) *mattul*, for *hand* (Swedish *handa*) only *hatt;* for *land*, only *lad*, &c. From *insula* also comes the Italian *isola*. The difficulty of passing quickly from the pronunciation of *n* to that of *m*, leads, in many languages, to a change of *n* before *m* into an *m;* thus the Latin *con*, *in*, the Greek εν and συν, the German *en*, are changed into *com*, *im*, &c., as *committere*, *impar*, the German *empor*, *empfangen*, *empfinden*, &c. Some languages put an aspirate before *n*, which in this case was probably pronounced with a strong breathing through the nose. Thus we find that for the German *nacken* (neck) the Anglo-Saxons had *hnecca;* for *neigen*, *hnigan;* for *napf*, *hnaeppe*. Palatic sounds were put before the *n* to strengthen it: thus the Germans made the Latin *nodus*, *knoten*, &c.: even the sibilant sound *s* was used to strengthen it, as the German *schnee* for *neu* (still used by hunters), from *nix*, &c. By the Germans in modern Latin, N N. is used to indicate a proper name which the writer does not know or does not choose to give; and, according to Du Fresne, this sign originated about the eleventh century, from the abbreviated *ille* or *illa*, which was written Ill, with a dash through it, which at a later period was taken for two *N's*. It is certain that ILL appears in the formularies of Marculphus, and other writings before the eleventh century. We often find *n* omitted by the Greeks and by the Romans, when not final; thus Cicero writes *Foresia*, *Megalesia*, for *Forensia*, *Megalensia*. On inscriptions we find IMPESA for IMPENSA, and MESIBUS for MENSIBUS. In Plautus we find *stas* for *stans*. N, as a numeral, signified 90, or, according to Baronius, 900; with a dash over it, it signified 90,000. With the Greeks, ν stood for 50. As an abbreviation, N signifies *noster*, and on medals of the Lower Empire, D. N. signifies *Dominus noster*; it often also signified *nos*, *novus*, *nepos*, *nobilis*. In geography, it stands for *north*. On French coins, it means the mint of Montpellier. The Spanish alphabet has a character *ñ*, called *n* with the *tilde*, and pronounced like *ni* in *onion*, *minion*; for instance, *España*, *Nuñez*, *niñez*.

NABIS, a Spartan king, who lived about B. C. 200, was a tyrant, who at first assumed the appearance of a just prince, but afterwards imitated, externally, the Asiatic despots. He was surrounded by an armed guard, and had a multitude of secret spies in his service. Every suspected person was immediately put to death or banished. He plundered Messina and Argos, and would have continued to extend his dominion still wider over Peloponnesus by artifice and force, had not the Romans, in alliance with the Achæans, declared war against him. Quintus Flaminius was not able to conquer him; but Philopœmen, with the army of the Achæan league, was more successful. The tyrant was at last killed in Sparta, by his own allies, the Ætolians, whom he had called into his assistance.

NABOB (a corruption of *navab*, the plural of *naib*, a deputy); in India, the title of a governor of a province or the commander of the troops; borne, however, by many persons as a mere titular appendage. The costume and trappings of a nabob are represented below. The nabobs were subordinate to the *subadars*, or governors of a great extent of country (a *subah*). After the invasion of Nadir Schah, they made themselves independent of the Great Mogul, but only to fall under the more grinding domination of the British. The term has become proverbial, in English, to signify a person who has acquired great wealth in Hindostan, or lives with peculiar splendour.

NABONASSAR; a king of Babylon, with whose reign begins an epoch, called the *era of Nabonassar*, 747 or 746 B. C. See *Epoch*.

NACRE, or MOTHER OF PEARL, is the inner part of the shell of the pearl muscle. This is of a brilliant and beautifully white colour, and is usually separated from the external part by aqua-fortis, or the lapidary's mill. Pearl muscle shells are on this account an important article of traffic to China and many parts of India, as well as to the different countries of Europe. They are manufactured into beads, snuff-boxes, buttons, and spoons, fish, and counters for card-playing, and innumerable other articles. The pearl muscles are not considered good as food; though, after having been dried in the sun, they are sometimes eaten by the lower classes of people in the countries near which they are found.

NADIR, in astronomy; that point of the heavens which is diametrically opposite to the zenith, or point directly over our heads. The zenith and nadir are the two poles of the horizon.

NADIR SCHAH, or THAMAS KOULI KHAN, king of Persia, a famous conqueror and usurper, was born at Calot, in the province of Khorasan, in 1686. His father was governor of a fortress on the borders of Tartary, to which office he succeeded in his minority, under the guardianship of an uncle who engrossed all the authority. He was subsequently kidnapped by the Usbecks, but escaped, after a detention of four years; and, in 1714, entered into the service of the beglerbeg of Muschadi, in Khorasan, where he so much distinguished himself by his bravery, that he was intrusted with the command of a thousand cavalry, and was soon after placed at the head of an army, with which he gained a great victory over the Usbeck Tartars. This achievement excited so much jealousy in the beglerbeg, that he gave the command to another person, and, when Nadir remonstrated, ordered him to be bastinadoed. Irritated by this disgrace, he joined a band of robbers, and with this troop ravaged all the country, and, surprising Calot, put his uncle to death, although he had been previously negotiating with him, to enter the service of schah Thamas, king of Persia, then exceedingly pressed by the Turks and Afghans. Such was the bad posture of his affairs, that the schah felt himself impelled to overlook this villany, and take Nadir into his service, who repulsed both his enemies, and was honoured with the title of *Thamas Kouli Khan*. The schah, during his absence, having in person sustained a defeat from the Turks, was induced to make peace with them, and Nadir was directed to disband his army of 70,000 men. Instead of obeying, he immediately led them to Ispahan, where he seized the schah, confined and deposed him, and proclaiming his son Abbas, then an infant, in his stead, assumed the title of regent. He forthwith renewed the war with the Turks, and recovered all the lost provinces; and the young king dying in 1736, he was raised to the sovereignty. This elevation only extended his views; and, being invited, by some conspirators about the person of the Great Mogul (see *Mongols*), to undertake the conquest of India, he began his march at the head of 120,000 men, and, with little resistance, reached Delhi, March 7, 1738. The riches which he found in this capital were immense; but, being exasperated by some tumults on the part of the inhabitants, he caused a general massacre, in which upwards of 100,000 persons perished. After this barbarity, the sanguinary victor concluded a peace with the Mogul, whose daughter he married, receiving with her, as a dowry, some of the finest provinces of the empire that were contiguous to Persia. In this expedition, it is supposed that he carried away, and distributed among his officers, valuables to the amount of £112,000,000. On his return, he levied war against the Usbecks and others; but had nearly lost his life by an assassin, instigated by his own son. In 1745, he defeated the Turks at Erivan. A conspiracy having been formed against him by the commander of his body-guard, and his own nephew, he was assassinated in his tent, June 8, 1747; his nephew, Ali Kouli, succeeding to the throne. This extraordinary usurper was of a tall stature and robust form, with handsome and expressive features. His conduct sufficiently marks his cruelty, ambition, and rapacity. His most favourable feature appears to have been a disposition to religious toleration. On his accession to the throne, he required certain curses pronounced annually on the caliphs preceding Ali, and other incentives to religious strife, to be dispensed with; which being objected to by the head of the clergy, he had him bow-strung.

NÆNIA (*Latin*); a funeral song, among the ancients, sung generally by women, at interments. As they were composed by the persons who sung them, and were rather unmeaning, the word came to signify any trifling, unmeaning song. *Nænia* was also the goddess of lamentation, who was invoked at the funerals of the aged, and had a temple before the Viminal Gate.

NÆVIUS, CNEIUS, one of the most celebrated among the earliest Roman poets, was born in Campania, and wrote tragedies and comedies after the model of the Greek. He also wrote an epic poem upon the Punic war, and another in imitation of the Cyprian Ilias. He lived in the first half of the sixth century after the building of Rome. By the introduction of some of the Roman nobility into his comedies, he provoked their anger, was banished from the city, and retired to Utica. Fragments only of his works have come down to us.

NAGASAKI, or NANGASACKI; a seaport of Japan, on the south-west coast of Ximo, situated at the end of a commodious bay; lon. 129° 45′ E.; lat. 32° 44′ N. It is a large commercial town, the only place where Europeans are permitted to trade, a privilege now confined to the Dutch. The Dutch town is built on the island of Desima, 600 feet long, and 120 broad, adjoining Nagasaki, and contains several large storehouses. The harbour is three miles long, and one broad. The Japanese town is divided into the inner and outward town; the former of which contains twenty-six, and the latter sixty-one streets, in none of which strangers are suffered to dwell; they have particular suburbs allotted to them, where they are narrowly watched by the emperor's officers. The chief public buildings are five *janaguras*, or large houses, of timber, where are kept three imperial *junks*, or men-of-war, ready to be launched at command; the palaces of the two residing governors, and other princes and grandees of the first and second rank; about sixty-two temples, within and without the city; most of them built on eminences, and serving not only for devotion, but also for recreation; the common prison, standing near the middle of the town, and consisting of about one hundred huts, or cages, separated from each other. The houses are low and mean; the inhabitants are mostly merchants, tradesmen, shopkeepers, and handicraftsmen. See *Japan*.

NAHANT is the Indian name of a peninsula, which extends into the sea from the township of Lynn, Massachusetts, nine miles south of Salem, and fourteen north-east from Boston. It is divided into Great Nahant, Little Nahant, and Bass Neck. The isthmus leading from the main land to Little Nahant is a mile and a half long, and very narrow. Passing over this small peninsula, another delightful beach, ninety rods long, connects it with Great Nahant. These beaches are very hard and smooth, and are of sufficient width, at low water, to accommodate thousands with a delightful walk or ride. Great Nahant contains 305 acres of land. The shores of this peninsula are bold and rocky. When an easterly wind drives the sea into the bay, the dashing of the waves against these shores presents a scene of great sublimity. During the most sultry part of summer, there is usually a refreshing breeze at Nahant, which renders it a place of great resort for those who seek for health or pleasure.

NAHL, JOHANN AUGUST, a sculptor, born 1710. at Berlin, and educated there under the celebrated Schluter. After having made a tour through France and Italy, he returned to Berlin in 1741, where, and likewise at Potsdam, Sanssouci, and Charlottenburg, many of his works are to be seen. In 1746, he went to Switzerland, and passed nine years in that country, principally at Berne. In 1755, Nahl was created professor in the academy of arts in Cassel, and there executed the admirable colossal statue of the landgrave Frederic, which stands in Frederic's square. He died in Cassel, 1781.

NAHUM; one of the twelve minor prophets, whose prophecies relate to the destruction of Nineveh, which he describes in vivid colours. His object, according to some late German writers, seems to be to represent to his nation, groaning under the oppression which they had suffered from the Assyrians, the total destruction of the haughty capital, as a just punishment of Jehovah. The period in which he lived is, however, uncertain, some placing it before, and some contemporary with that event.

NAIADS (from the Greek *ναιω*, to inhabit, or *ναω*, to swim), in the Greek mythology; nymphs of fountains and brooks. The notions and tales of the ancients concerning the Naiads resemble, in some points, those which the northern mythology gives us of the Nixies. The Naiads are represented as beautiful women, with their heads crowned with rushes, and reclining against an urn, from which water is flowing.

NAIL-MAKING. Nails are made both by hand and by machinery. *Wrought nails* are made singly at the forge and anvil, by workmen who acquire, from practice, great dispatch in the operation. Machines have been made for making these nails perfectly, and with rapidity; yet they have not come into general use, owing to the cheapness of the product by manual labour. *Cut nails* are chiefly made by machinery invented in the United States of America. The iron, after having been rolled and slit into rods, is flattened into plates of the thickness intended for the nails, by a second rolling. The end of this plate is then presented to the nail machine, by a workman, who turns the plate over once for every nail. The machine has a rapid reciprocating motion, and cuts off, at every stroke, a wedge-shaped piece of iron, constituting a nail without a head. This is immediately caught near its largest end, and compressed between *gripes*. At the same time, a strong force is applied to a die at the extremity, which spreads the iron sufficiently to form a head to the nail. Some nails are made of cast iron, but these are always brittle, unless afterwards converted into malleable iron by the requisite process.

NAIN; a village eight miles from Nazareth, forty-two from Jerusalem, at the foot of mount Hermon, celebrated as the place where Christ restored a dead man to life.

NAIRN; a small county in the north-eastern part of Scotland, formerly included in Morayshire, by which it is bounded on the east and south; on the north, it borders on the Moray Firth, and on the west it joins Inverness-shire. It is from sixteen to twenty miles in length, and from ten to twelve in breadth. The river Nairn, descending from the hills of Inverness, and flowing towards the north-east through a fertile valley, falls into the firth at the county town, to which it gives its name. The Findhorn intersects the southern part of the county, which consists chiefly of high moorland. Population of the county in 1831, 9,354.

NAIVETE; a French word, which has become naturalized in several other languages; for instance, in the English. The word is of Latin origin, derived from *nativus* (natural, something possessed from nature); in low Latin, *naivus*. The French *Dictionnaire de l'Académie* gives the following definition of *naif:—naturel, sans fard, sans artifice*, also *qui représente bien la vérité, qui imite bien la vérité*, and of a person, *qui dit sa pensée ingénument et sans détour*. Sometimes it is used in dispraise, and then means, *qui est trop ingénu dans sa simplicité*. It could easily be imagined, that a word of such a description, received into a foreign language, would be used in no very distinct and precise meaning. The essential meaning of the word is a natural, unreserved expression of sentiments and thoughts, without regard to conventional rules, and without weighing the construction which may be put upon the language or conduct. Thus it is intimately connected with what the ancients called *charis* (*gratia*), as Ramdohr, in his work *Charis*, has shown. *Naïveté*, therefore, can appear such only to a person accustomed to the practice of conventional proprieties. *Naïveté* generally implies inexperience of the world; hence it is not unfrequently taken for want of judgment. It implies simplicity of heart, unimpaired by the chilling experiences of life, and unfettered by the capricious regulations of society, trusting with childlike confidence, as it has no disposition to cunning or guile. Schiller says *naïveté* unites childlike with childish simplicity; and the latter ingredient awakens in the observer the smile of superiority. But as soon as we have reason to believe that the childish simplicity is more truly childlike, proceeding from a heart full of innocence and truth, and a greatness of soul which disdains concealment and artifice, then the smile of self-complacency vanishes, and is succeeded by admiration of the ingenuousness presented to us. The term is sometimes applied to works of literature or the fine arts; for instance, to poetry, which expresses natural feeling in a simple manner; particularly to that of the earlier ages or lower orders of society; or to music, which, without studied correctness, speaks directly to the heart. No affectation is so offensive as affected *naïveté*, because it bears the stamp of hypocrisy and deceit on its forehead; and yet how often is it met with in modern society!

NALDI, SEBASTIANO; a celebrated Italian buffo singer, who visited London in the early part of the present century. Naldi met his death in Paris, in 1819, by the explosion of an apparatus which had been invented for cooking by steam.

NAMES. These are, 1. given or baptismal names (see Dolz's work upon Baptismal Names, Leipsic, 1814); 2. family names, which are added as an hereditary distinction to the proper or baptismal names. The Greeks, with the exception of a few families at Athens and Sparta, had no family names. Among the Romans, each person had commonly three names —a proper name (*prænomen*, the distinction of the individual), the name of the clan (*nomen*), and the family name (*cognomen*). Sometimes, also, a surname was added, which was borrowed from some distinguished exploit or remarkable event. The *prænomen* was placed first, and commonly written with one or two letters; for example, A., Aulus; C., Caius; L., Lucius; M., Marcus; P., Publius; Q., Quintus; T., Titus; Ap., Appius; Cn., Cneius; Sex., Sextus, &c. Then followed the *nomen;* for example, Cornelius, Fabius, Julius (from the clan (*gens*), Cornelian, Fabian, Julian). Lastly came the *cognomen;* for example, Cicero, Cæsar, Scipio, and others. In the name M. Tullius Cicero, M. is the *prænomen*, which distinguishes him from his brother, Quintus; Tullius, the *nomen*, which distinguishes the clan (*gens*); and Cicero the *cognomen*, which shows his family. Instances of surnames (*agnomen*) are *Africanus* (see *Scipio*) and the like. In Germany, and other kindred nations, family names were little used by commoners before the fourteenth century. Every one had a baptismal name only. The most ancient method of distinguishing different individuals of the same name consisted in adding their father's name to their own; hence originated many English, Danish, and German names, which end in *son, sohn, sen;* for example, *Johnson, Williamson, Thorwaldson, Wilmsen* (that is *Williamsson*). To this class belong, without doubt, also, those proper names ending in *i* (the termination of the Latin genitive), which frequently occur as names of a clan, such as *Augusti* (*Augusti filius*). In a similar manner originated the Spanish names ending in *ez*, such as *Fernandez, Rodriguez;* that is to say, Ferdinand's, Rodrigo's son. (See the articles *Mac*, and *Fitz*.) The Arabians call no one by his own or proper name. Suppose some one whose father is named *Hali*, and whose own name is *Zoar;* he would be called *Ebn Hali* (Hali's son), and his son *Ebn Zoar*. With feudalism, new names were introduced, derived from the districts conferred on the nobles, or from the feudal relations. The nobility had, everywhere, family names long before the commoners. Another class of family names among commoners was derived from their occupations or the places of their birth; for example, *Smith, Miller, Fisher, French, Welsh, Dutch*, &c., or from the signs which tradesmen put up before their shops, such as *King, Duke*. Sometimes striking external peculiarities have given origin to names, which have descended to the posterity of those on whom they were bestowed, such as *Brown, Long, Broadhead*. In Germany, family names first came into general use among commoners in the seventeenth century. See Wiarda's *Ueber Deutsche Vor und Geschlechtsnamen* (Berlin, 1800), Eusèb. Salverte's *Essai Historique et Philosophique sur les Noms d'Hommes, de Peuples et de Lieux, considérés principalement dans leurs Rapports avec la Civilisation* (Paris, 1824, 2 vols.).

NAMUR; lately a province of the kingdom of the Netherlands, since 1831 belonging to Belgium. It is composed of the greatest part of the county of Namur, of a part of the principality of Liege, and some parts of the duchy of Brabant and French Hainault; within these limits, constituted in 1814, it contains 156,400 inhabitants, on a superficial area of 1380 square miles. The soil is remarkably rich; the face of the country is a plain, interrupted by low hills, which are covered with woods. Besides the products of tillage and grazing, which is extensively carried on, iron, copper, lead, marble, and coal are found. The county of Namur was sold by the last count to Philip the Good, duke of Burgundy, in 1421. By the marriage of Maximilian with Mary of Burgundy (1477), it passed, with the other Belgic provinces, to the house of Austria; by the peace of Luneville, it was ceded to France, and formed a part of the French empire till 1814, when it was annexed to the new kingdom of the Netherlands. See *Netherlands*.

NAMUR; the capital of the Belgic province of the same name, and an Episcopal see, situated at the confluence of the Sambre with the Meuse; lat. 50° 28′ N.; lon. 4° 21′ E.; twenty-eight miles from Brussels; 116 from Amsterdam. The fortifications, which were destroyed by Joseph II. (1784), have been restored, and, since 1817, considerably enlarged; it has also a citadel on a steep rock. The cathedral is the principal public edifice: there are sixteen other churches, several hospitals, &c.; population, 16,150. Cutlery and other iron wares, glass, leather, tobacco, are the principal articles of manufacture. Namur has been often taken in the wars between France, Holland, and Austria, and has been several times inundated.

NANCY; a city of France, formerly the capital of the duchy of Lorraine, now the chief place of the department of the Meurthe; a bishop's see; lat. 48° 42′ N.; lon. 6° 10′ E.; population, 29,122. The natural situation of the city, in a pleasant plain, near the left bank of the Meurthe, is agreeable, and the buildings are handsome. The embellishments of the place are principally owing to Stanislaus, king of Poland, who resided here. The old town is dark and irregularly built, but the new town is regularly laid out, and contains handsome streets, with splendid buildings and delightful public walks. The royal square, from which a triumphal gate leads into Carrière square, containing a promenade, terminated by the government palace, and two beautiful gates, leading into the old town, and the Pepinière, a charming walk, is particularly distinguished. Alliance square has its name from two pillars erected, in 1759, commemorative of the alliance concluded between France and Austria. Among the churches, the cathedral, and the Franciscan church, with its rotunda, are the most deserving of attention; the latter contains the tomb of Charles the Bold, duke of Burgundy, who fell under the walls of Nancy, in 1477. There are also an academy, a public library of 23,000 volumes, a lyceum, a society of arts and sciences, a cabinet of natural philosophy, a botanical garden, and numerous other literary and charitable institutions. Woollen and cotton goods and paper hangings are the principal articles of manufacture. Louis XIV. took possession of Nancy in 1661, and caused the fortifications to be demolished.

NANGASACKI. See *Nagasaki*.

NANI, John Baptist Felix Gaspar, a Venetian historian, was born at Venice, in 1616, and educated with care. In 1638, he accompanied his father to Rome, whither the latter was sent as ambassador. In 1643, he himself was sent as ambassador of the republic to France. His mission lasted twenty-five years, during which he enjoyed the confidence of cardinal Mazarin. He was appointed historiographer and keeper of the archives of the republic. He resided three years as ambassador at Vienna. From Louis XIV., he obtained back Candia. He was also made procurator of St Mark, the highest dignity after that of doge, and was one of the commissioners who compiled the *Legum Venetarum compilatarum Methodus* (1678, 4to). He died in the year 1678. He left a relation of his second mission in France, and a report on the condition and resources of Germany; but his great work is *Istoria della Republica Veneta*, the first part of which was published in 1676 (4to), the second, after the author's death. It forms the eighth and ninth volume of the Collection of Venetian Historians (1720, 4to). Nani begins his work with the year 1613. It is praised for the political sagacity which it exhibits, but the style is censured.

NANKEEN, or NANKING; a sort of cotton cloth, which takes its name from the city of Nanking, where it was originally manufactured. It is now imitated in most other countries where cotton goods are woven; but those of the East are superior, on account of the natural colour of the cotton (*gossypium religiosum*) being reddish, while, in those countries where white cotton is used, it is necessary to give it the proper hue by artificial means.

NAN-KING, or NANKIN, or KIANG-NING; a city of China, capital of Kiang-nan, 500 miles south-east of Peking; lon. 118° 47′ E.; lat. 32° 5′ N.: the amount of the population is uncertain; it has been computed at one, two, and even three millions. Nanking surpasses in extent all the other cities of China. We are assured that its walls are sixteen miles in circumference. This city is situated at the distance of three miles from the river Yangtse-kiang. It is of an irregular figure, the mountains which are within its circumference having prevented its being built on a regular plan. It was formerly the imperial city; for this reason it was called *Nan-king*, which signifies the *southern court*; but since the six grand tribunals were transferred to Pe-king, it has been called *Kiang-ning*, in all the public acts. Nanking has lost much of its ancient splendour. It had formerly a magnificent palace, no vestige of which is now to be seen; an observatory, at present neglected; temples, tombs of the emperors, and other superb monuments, of which nothing remains but the remembrance. A third of the city is deserted, but the rest is well inhabited. Some quarters of it are extremely populous, and full of business. It is still the first city in China with regard to manufactures. The staple one is silk, also the cotton stuffs that bear its name; beautiful paper and printing. It is also the most learned city in the empire, and produces the greatest number of doctors, and has the best furnished booksellers' shops. The streets are not so broad as those of Pe-king; they are, however, very beautiful, well paved, and bordered with rich shops. Here are no public edifices corresponding to the reputation of so celebrated a city, except its gates, which are beautiful, and some temples, among which is the famous porcelain tower—a pagoda of octagonal form, 200 feet high, and divided into nine stories, by plain boards within and without, by cornices and small projections covered with green varnished tiles. It is mounted by 884 steps.

NANNINI, Agnolo (known under the name of *Firenzuola*, the place whence his family originated), a celebrated author, born in Florence, in 1493, studied at Sienna and Perugia, went to Rome, and entered the order of Valombrosa, and became successively abbot of Sta. Maria di Spoleto, and of S. Salvador di Vajano. He was, from his youth, a friend of the noted Pietro Aretino, whom he resembled in his morals. The time of his death is uncertain. His works, of which the best edition appeared at Florence (3 vols. 1763), bear the marks of a lively, satirical, licentious mind; they are partly in verse and partly in prose, and are celebrated for their purity of style, on which account they are often cited by the Crusca. Among them are two comedies, *I Lucidi* and *La Trinunzia*, an imitation of the Golden Ass of Apuleius, eight *Novelle*, and a Dialogue on the Beauty of Women, &c.

NANTES, a city of France, capital of the department of the Lower Loire, an episcopal see, is situated on the Loire, twenty-six miles from the Atlantic, in an agreeable country, formerly in the province of Brittany; lon. 1° 23′ W.; lat. 47° 13′ N.; population, 81,739. It is one of the largest and richest commercial cities in France. Its old ramparts have been demolished, and it is now connected with its five suburbs, which surpass the city in extent and beauty; it has twenty squares, seventeen churches, and many handsome buildings; the streets are generally well laid out and neatly paved. Nantes contains, besides the various judicial and executive offices, a commercial chamber, a commercial tribunal, a lyceum, a medical and anatomical school, a navigation school, a public library (30,000 volumes), a picture gallery, and other scientific and literary establishments. The manufactures are extensive and increasing; cloths, cotton goods, cutlery, printed linens, hats, leather, cordage, iron, cables, earthenware, glass, spirituous liquors, are among the principal articles produced. Ship-building is carried on to a considerable extent. The sugar refineries are numerous. Its commerce with Africa, the American and Indian colonies, and all parts of Europe, is active and important. Its inhabitants are also engaged in the cod and other fisheries. Ships of above ninety tons unload at Paimboeuf, a village twenty miles below Nantes. In 1824, 2963 vessels entered the port, of which 352 were engaged in the fisheries, and 2392 in the coasting trade. Henry IV. here issued the edict called from this city, granting the Protestants the free exercise of their religion, in 1598. (See *Huguenots*.) Louis XIV. revoked it in 1685. Nantes suffered much during the revolution, by the war of the Vendée, carried on under its gates, by the atrocities (*Noyades* and republican marriages) of the infamous Carrier (q. v.), and by the interruption of its commerce. Before the conquest of Gaul by the Romans, it was the capital of the Namneti or Nanneti. It was afterwards, with Rennes, the residence of the dukes of Brittany, and was annexed to France by the marriage of Louis XII. with Anne of Brittany.

NANTUCKET; an island of Massachusetts, south of the peninsula of cape Cod, from which it is distant about twenty miles. It is about 120 miles south-south-east of Boston. The island is fifteen miles long, and its widest part is eleven miles; lat. 41° 13′ to 41° 22′ N.; lon. 69° 56′ to 70° 13′ W. The town of Sherburne formerly comprehended the whole island; but this name is now out of use. The island, town, and county of Nantucket have the same limits; but the county of Dukes is associated with it for several political purposes. A great part of the inhabitants are of the denomination of Friends, or Quakers. The land is mostly held in common. Little attention is paid to agriculture; and the sheep and cows of all the inhabitants feed in one great pasture. The right of the island was originally granted by William, earl of Sterling, to Thomas Mayhew, and conveyed by him to nine proprietors, who divided it into twenty-seven shares, in 1659. It is mostly a joint property to this day, although the number of shares has increased to more than 3000. The inhabitants are mostly concerned in the whale fishery, and the seamen are the most skilful and adventurous in the world. Their trade suffered greatly by the late war, and by the war of the revolution. It has since been more flourishing, and the spermaceti works are very extensive. The port of Nantucket is on the north-west side of the island, and has a very good harbour. Nantucket contains two banks, two insurance offices, and seven houses of public worship. The population, in 1820, was 7266; in 1830, 7202. The amount of shipping, in 1820, was 28,512 tons. Education is well attended to, and the habits of the people are generally industrious and moral. For many years, Nantucket has been destitute of indigenous trees, and few are cultivated.

NANTUCKET SHOAL; a dangerous sandy shoal, south-east of Nantucket island, about forty or fifty miles long. Its breadth is various, and the shoal seems to be longer and broader in some years than in others. Many vessels are wrecked on it.

NAPÆÆ (Greek ναπη, a grove); the nymphs of woods. See *Nymphs*.

NAPHTHA. See *Bitumen*.

NAPIER, JOHN, of Merchiston, near Edinburgh, the distinguished inventor of the logarithms, was born in the year 1550. He was descended from an ancient race of land proprietors in Stirlingshire and Dumbartonshire. His father, Sir Alexander Napier of Edinbellie, in the former county, and Merchiston, in the county of Edinburgh, was master of the mint to James VI., and was only sixteen years of age when the subject of this memoir was born. The mother of the inventor of the logarithms was Janet, only daughter of Sir Francis Bothwell, a lord of session, and sister of Adam, bishop of Orkney. There is a prevalent notion that the inventor of the logarithms was a nobleman: this has arisen from his styling himself, in one of his titlepages, *Baro Merchistonii;* in reality, this implied *baron* in the sense of a superior of a barony, or what in England would be called lord of a manor. Napier was simply *laird* of Merchiston—a class who in Scotland sat in parliament under the denomination of the *lesser barons*.

Napier was educated at St Salvator's college, in the university of St Andrews, which he entered in 1562. He afterwards travelled on the continent, probably to improve himself by intercourse with learned and scientific men. Nothing farther is ascertained respecting him, till after he had reached the fortieth year of his age. He is then found settled at the family seats of Merchiston, near Edinburgh, and Gartness, in Stirlingshire, where he seems to have practised the life of a recluse student, without the least desire to mingle actively in political affairs. That his mind was alive, however, to the civil and religious interests of his country, is proved by his publishing, in 1593, an exposition of the Revelations, in the dedication of which to the king, he urged his majesty, in very plain language, to attend better than he did to the enforcement of the laws, and the protection of religion, beginning reformation in his own "house, family, and court." From this it appears that Napier belonged to the strict order of presbyterians in Scotland; for such are exactly the sentiments chiefly found prevalent among that class of men at this period of Scottish history.

In 1596, he is found suggesting the use of salt in improving land; an idea probably passed over in his own time as chimerical, but revived in the present age with good effect. No more is heard of him till, in 1614, he astonished the world by the publication of his book of logarithms. He is understood to have devoted the intermediate time to the study of astronomy, a science then reviving to a new life, under the auspices of Kepler and Galileo, the former of whom dedicated his Ephemerides to Napier, considering him as the greatest man of his age in the particular department to which he applied his abilities. The invention was very soon known over all Europe, and was everywhere hailed with admiration by men of science. Napier followed it up, in 1617, by publishing a small treatise, giving an account of a method of performing the operations of multiplication and division, by means of a number of small rods. These materials for calculation have maintained their place in science, and are known by the appellation of Napier's Bones.

In 1608, Napier succeeded his father, when he had a contest with his brothers and sisters, on account of some settlements made to his prejudice by his father, in breach of a promise made in 1586, in presence of some friends of the family, not to sell, wadset, or dispose, from his son John, the lands of Over Merchiston, or any part thereof. The family disputes were probably accommodated before June 9, 1613, on which day John Napier was served and returned heir of his father in the lands of Over Merchiston. He did not long enjoy the inheritance which had fallen to him so unusually late in life. He died, April 3, 1617, at Merchiston castle, and was buried in the church of St Giles, on the eastern side of its southern entrance, where is still to be seen a stone tablet, exposed to the street, and bearing the following inscription:—"Sep. familiæ Naperoru. interius hic situm est."

Napier was twice married; first, in 1571, to Elizabeth, daughter of Sir James Stirling of Keir, by whom he had a son and a daughter; secondly, to Agnes, daughter of James Chisholm of Cromlix, by whom he had ten children. His eldest son, Archibald, who succeeded him, was raised to the rank of a baron by Charles I., in 1627, under the title of lord Napier, which is still borne by his descendants. A very elaborate life of him was published in 1835 (Blackwood, Edinburgh).

NAPLES (*Napoli*); capital and royal residence of the kingdom of the Two Sicilies, in the Terra di Lavoro; lat. 40° 50′ N., lon. 14° 15′ E., with 351,754 inhabitants, exclusive of foreigners. Antiquity gave it the title of *Otiosa;* at present, notwithstanding history records forty rebellions by the Neapolitans, it bears the appellation of *Fidelissima.* Its situation, population, and wealth, entitle it to rank among the first cities of the world. Splendidly situated on the margin of a majestic bay, from which the islands of Capri and Ischia rise in bold outline; overlooked and menaced, on the right, by Vesuvius; on the left gently sinking into the arms of the Pansilippo,—it seems to revel in the blessings which Heaven pours upon the happy land. The ancients knew how to appreciate the enchantments of this region, and fables told of a temple and grave of a Siren, by name *Parthenope* (from which it derived its ancient name), situated here; but the fable and the name only denote the charms of this Eldorado. The Neapolitan is still proud of his country: he calls it a piece of heaven fallen upon the earth, or exclaims, with patriotic ardour, "See Naples and die (*Vedi Napoli e poi muori!*") And, indeed, few regions possess so many advantages. The air is mild, balmy, and salubrious; the heat of summer, except when the sirocco blows, is tempered by the cooling influences of the sea, whose azure mirror attracts and delights the eye, while its bosom affords a bounteous variety of fish; the fields are decked with grain and vines, which wind picturesquely around the elms and noble fruit-trees. About 350,000 people throng the streets of the city, in which the bustle ceases not, by night or day. The most spacious and magnificent of all the streets—the Toledo—resembles a perpetual fair, and the passenger must be cautious to avoid being run over by the *curricoli*, or one horse vehicles, which dart by with the rapidity of lightning. The harbour, which, however, is not very large, swarms with vessels from all quarters of the globe; and the pier, or mole, is always full of men, who are either pursuing their business, or are idly assembled around the booth of a pulcinello, or around a juggler or minstrel, and improvvisatore. The fashionable world, especially in the evening, promenade in superb equipages the streets Sta. Lucia and Chiaja, which stretch along the sea; the last is adorned with stately palaces, among which is the Villa Reale, a royal garden, lying on the edge of the sea, and containing the celebrated group of the Farnese Bull. The prospect over the bay, to Vesuvius and the coasts of Sorrento, is unique. But it is only nature and the activity of its present, with the various memorials of its past existence, that makes Naples and its environs so enchanting. The reflecting traveller, after having contemplated, in Florence and Rome, the wonders of art, and the monuments of proud times that are gone,—great even in their ruins,—finds in Naples little to gratify, and much to offend his taste for the beauties of art. The luxuriance of nature seems to have been communicated to the style of art, and given it a character of exaggeration. This is true of the architecture, with the exception of the office of finance, in the street called Toledo. The edifices of importance in Naples betray bad taste, in excess of ornament and unsuitable additions, or bear the stamp of insignificance in their baldness and uniformity. Statuary and painting are in no better condition. Music has been more successfully cultivated. Those ornaments of Rome—obelisks and fountains—appear here only in miserable imitations. Even the public inscriptions, particularly those of the time of the Spanish dominion, are written in a style of Oriental bombast. Among the 122 churches (none of which are distinguished for their architecture), the 130 chapels, and 149 monasteries, that of St Januarius, or the cathedral, is the principal. It was built in 1299, from the designs of Niccolo Pisano; but the Neapolitans have endeavoured to destroy, as much as possible, its Gothic character. The body of the saint reposes in a subterranean chapel, under the choir. His blood is kept in the splendid chapel of the Treasure, adorned by four altar-pieces, from the pencil of Domenichino. Il Gesu Nuovo is considered the handsomest church in Naples; at least, it has the best dome, though it is overcharged with unmeaning ornament. The church of the rich convent of S. Chiara resembles a dancing-hall, rather than a temple; it formerly contained some frescoes by Giotto. S. Domenico is large; S. Filippo Neri, rich in marble and paintings; S. Paola Maggiore shows, on its front, the remains of an ancient temple of Castor and Pollux; S. Apostoli is admired; small, but hallowed by the tomb of Sannazzaro, is the church Sta-Maria del Parto in Mergellina, founded by him. The Carthusian monastery S. Martino, situated on a hill, under the castle of S. Ermo, enjoys a most delightful prospect, and is, at present, the barracks of the Invalids. The whole structure is superb, and the church is ornamented with peculiar richness. Above the monastery is situated the castle of S. Ermo, which commands the whole city, and, with its cannon, checks the violences of the lazzaroni (q. v.), of whom there are about 30,000. Naples is also fortified against external attacks, especially by way of the sea; for to the east lies the Castello Nuovo, and, to the west, the Castello del Uovo (so called from its oval shape) extends, on a rock, into the sea. Among the palaces, the royal palace is distinguished above the rest for its architecture; the place before it is one of the greatest ornaments of Naples. Another royal palace at Capo di Monti, is unfinished, but contains many paintings, and other works of art. The ancient residence of the viceroys of Naples, La Vicario has been appropriated to the accommodation of several tribunals, and, in part, converted into prisons. Among the other palaces are the Maddalone, Francavilla, Gravina, Tarsia, which last has a considerable library, open to the public. The most important collections in the arts and sciences are contained in the building of the academy Degli Studj (Museum Bourbon), the lower apartments of which are allotted to ancient statues, of which we shall here mention only the Farnese Hercules, the Farnese Flora, the equestrian statues of the two Balbuses, the Venus καλλιπυγος (*aux belles fesses*), and an excellent Aristides. The second floor contains a valuable collection of Etruscan vases, a gallery of paintings, and the royal library. The university founded by Frederic II., in 1224, is of some consequence as a building, but of little note as a place of education. It contains several good collections; for instance, a mineralogical cabinet. The botanical garden is gradually improving. There is also an observatory, a royal medical college, a military school, a naval college, an academy of agriculture, manufactures, and arts, a college for the instruction of Chinese and Japanese youth, two Jesuit colleges, &c., and a royal society of sciences. The number of benevolent institutions is above sixty. Among them are two large hospitals—*Degli Incurabili* (where, however, sick of all kinds are received) and *Della Santissima Annunziata*, which is very rich, and receives and provides for foundlings, penitent females, &c. There are five other hospitals, many religious fraternities, and several conservatories, which last were long famous as the seminaries of music for all Europe. The Albergo dei Poveri, with a school of mutual instruction for 400 children, is one of the greatest buildings of the kind. But pleasure, not serious business, has its abode in Naples, and amusement is the general aim. For the idle populace, there is no want of entertainment—pulcinellos, music, oranges, macaroni, and room to sleep. For the better classes, there are four theatres, of which the largest, S. Carlo, was burned in 1816, but has been splendidly rebuilt. Besides this theatre, there are the Teatro Nuovo, de' Fiorentini, and S. Carlino. In respect to music and representation, they hardly reach mediocrity; but the ballet is magnificent. The nobles are opulent and fond of parade; the citizens are thriving; and the lowest class (the lazzaroni) are, in general, so temperate that, from the cheapness of provisions, they can live with the least pittance, got by work or begging, and reserve something for the *divertimenti* on the mole, and, if they have no other shelter, trust to the mildness of the climate, and spend the night under the portico of a palace or a church. Compared with the number of inhabitants, the manufactures are unimportant; the artisans have little skill. The furniture made in Naples is clumsy. The best jewellers, tailors, and shoemakers are foreigners; the best *traiteurs*, Milanese; and the only circulating library was set up, a few years ago, by a Frenchman. From the situation of the city, its commerce might be extensive. The bank of the Two Sicilies has a capital of 1,000,000 ducats. Female beauty is rare in Naples, but the men are vigorous and well formed, especially at the age of maturity. In literary cultivation, the Neapolitans are altogether behind the other Italians, although they have many famous names. Among the scholars of the nineteenth century, some Neapolitans are distinguished, as Piazzi, Cuoco (author of a History of the Revolution of 1799, and of the *Viaggi di Platone in Italia*), the prince of S. Giorgio (an antiquarian and poet), the duke of Ventignano (a tragic poet). The lawyers, 4000 in number (called *paglietti*, or *straw-hats*), hold a great portion of the real estate in their hands, in consequence of the number and length of the lawsuits. The character of the people is not so suspicious as many travellers have represented it. There is much good humour and cordiality, and a temperance worthy of imitation among them; with all their violence, murders are seldom heard of. The immorality is not more than that of other great cities; and the love of idleness and pleasure has its foundation and excuse in the nature of the climate.

La terra molle, e lieta, e dilettosa,
Simili a se gli abitator produce.
TASSO'S *Ger. Lib.* I. 62.

The environs of Naples are rich in wonders of nature, art, and innumerable remains of antiquity. On the west side of the city is the ridge of the Pausilippo. It is said to owe its name to the effect of its beauty in lulling the sense of grief (*ἀπο της παυσεως της λυπης*). Its grotto is an arched way, which the ancients often mention, but which Alphonso I. enlarged, and the viceroy Peter of Toledo paved. (See *Pausilippo*) In a garden above it is situated the pretended tomb of Virgil, a *columbarium* or Roman tomb, with several niches, in which once stood urns. The laurel, which once flourished there, but which had to surrender its foliage to every traveller, is gone. Following the road through the grotto of Pausilippo, we come to the lake of Agnano, which is enclosed in a picturesque manner by mountains, of which the one on which is situated the monastery of the Camaldoli is the highest. The prospect from this eminence extends over the whole of Campania Felix, far out over the islands and sea, and is incontestably one of the richest and most delightful in the world. The lake of Agnano has the property of boiling up in some places, but is not, however, hot. In the summer, when all the hemp of the neighbourhood is rotted in the lake, the air is extremely unhealthy. On its banks are the sudatories, or vapour-baths of S. Germano, consisting of vaults, from the floor of which a sulphureous vapour issues, and the celebrated *Grotta del Cane*, the bottom of which is covered with a stratum of carbonic acid gas, in which the guides generally immerse a dog, and draw him out, when on the point of suffocating, to recover in the open air. A grotto leads into another romantic valley, surrounded by the Leucogean rocks. At the foot of these hills is the *Acqua delle Piscianelle*, a very warm sulphureous water, issuing from the ground with a noise. On the other side of the rocks lies the Solfatara (*Forum Vulcani*, *Campi Phlegræi*), a very remarkable volcanic valley, 900 feet long, and 750 broad. A volcanic mountain was, in all probability, once carried down here, without being entirely extinguished. The ground, which is covered with a whitish clay, and trembles under the feet, is hollow; from every hole and crack, sulphureous vapours issue. The deposits of the native sulphur, in various colours, on the wild rocks, increase the terrific appearance of this region. On leaving it, and turning towards Pozzuoli, all the charms of southern flowers, and the prospect of the sea, greet the eye. We approach Pozzuoli over the remains of an ancient road, admiring, on the way, the relics of former splendour, particularly the ruins of a *Piscina* (commonly called a labyrinth), of a great amphitheatre, and of the *thermæ*, or warm baths. The old Via Campana is studded, on both sides, with the picturesque ruins of ancient tombs, consisting mainly of *columbaria*, and still exhibiting traces of painting. The town of Pozzuoli is situated on a small peninsula, and contains 14,600 inhabitants. The cathedral was formerly a temple, dedicated to Augustus, and still contains several antique columns. Of a statue of Tiberius, only a very beautiful pedestal, in the market place, has been preserved. By far the most beautiful monument of Roman antiquity is the ruins of a temple of Jupiter Serapis, which was built in the reign of Domitian. Three columns only of Cipollino marble are at present standing, overlooking in sadness a chaos of beautiful fragments. What is called the *bridge of Caligula*, in the harbour of Pozzuoli, consists of a row of pillars, projecting above the surface of the water, probably the ruins of a mole. On the other side of the city lies Monte Barbaro (the ancient *Mount Gaurus*, celebrated for its costly wines), at the foot of which stood Cicero's academy and Cumanum. Next in order is the Monte Nuovo, which was raised in 1538, in the night, by an earthquake, that utterly destroyed the contiguous village of Tripergole. On this occasion, the neighbouring Lucrine lake, whose oysters and fish were in so high repute with the ancient gourmands, was almost entirely drained, and is now a small pond. Not far from this place are the steam-baths of Tritola (called, also, *Stufe di Nerone*), a series of grottoes, filled with a hot, suffocating vapour, to which the sick resort from Naples. Through the cave of the Cumæan Sibyl, mentioned by Virgil, we pass from the Lucrine lake to lake Avernus, a round basin, surrounded by woody hills, probably the crater of an extinct volcano. Following the road along the bay of Pozzuoli, we come to Baiæ (q. v.), highly celebrated among the Romans, where there are still several ruins, which seem to be the remains of the famous *thermæ*. In the vicinity lies the Lago di Fusaro, which, in this region of fables, was the Acheron of the ancients (*Acherusia Palus* of Virgil), and between this and the Avernus is Cuma, displaying but few traces of the ancient Cumæ. Between Baiæ and the village of Bacola (the Bauli of the ancients) is the *Piscina Mirabile*, the remarkable remains of an ancient reservoir, and the *Cento Camarelle* (Hundred Chambers), a suite of twelve or thirteen subterranean apartments, probably the foundation of some great edifice. On one side of Bacola is situated a lake, called Mare Morto, and connected with the sea merely by a narrow strait, on the banks of which the ancients placed the Elysian fields. At the eastern extremity of the bay of Pozzuoli lies Capo Miseno, the site of an ancient city. The *Grotta Dragonara* is now the most important object there. Between Cumæ and the river Volturno, on a large marsh (Lago di Patria), is a tower, called *Torre di Patria*, which is regarded as the sepulchre of Scipio Africanus. On the east side of Naples, the road leads to Vesuvius, Herculaneum, and Pompeii. (*See these articles.*) Four miles from Naples lies the village and palace of Portici. The style of the palace is entirely destitute of taste, and it is untenantable. The high-road passes through one of the courts of the castle. Sixteen chambers contain a collection of more than 1500 fresco paintings, and other treasures of antiquity, saved from Herculaneum. At Caserta, Charles III. employed Vanvitelli to erect a palace, imposing from its magnitude, but, from its monotony, resembling a barrack rather than a royal residence. The situation is excellent. The famous aqueduct *(acquidotto Carolino)*, which conveys the water from Monte Taburno to Caserta, is unique of its kind, and comparable with the boldest works of the Romans. While the country around Naples resembles a flourishing garden, the sea is also adorned with the most beautiful scenes. A sail in the bay of Naples, along the coast, or to the islands, is one of the greatest pleasures in the whole tour of Italy. Capri (q. v.), which rivets the attention, is at some distance. More convenient for short excursions are the small islands of Lazaretto and Nisida, and near to Baiæ and Miseno, are Procida and Ischia. Vineyards, gardens, groves, and villages alternate in charming variety, in Ischia; in their midst rises majestically to the height of 2356 feet Mt. Epomeo, or S. Nicola, formerly a volcano; but, since 1302, it has not disturbed the tranquillity of the beautiful island. The sick derive benefit from the cold mineral springs there. The island of Ischia contains 24,000 inhabitants. Respecting Naples, see Romanelli's *Napoli antica e moderna* (1815, 3 vols); *Nuova Guida di Napoli* (1826).

Naples, Kingdom of, See *Sicilies, The Two.*

NAPLES AND SICILY, Revolution of, in 1820 and 1821. The civil condition of Italy has contained, for centuries, the seeds of political revolutions. The French revolution matured and unfolded them. In Naples and Palermo, new causes of discontent arose, which resulted in an insurrection. The king, before he returned to Naples, had abolished (July 23, 1814) the constitution established in Sicily by lord Bentink, in 1812, on the model of the British. The reforms introduced by the minister Medici were carried into effect too slowly to satisfy the people; and the Neapolitan officers, who had served under Murat, could not endure the humiliations inflicted on their national pride by the Austrian field-marshal count Nugent, commander-in-chief of the army of the Two Sicilies, and minister of war. When count Nugent abolished the French organization of the army, and introduced the Austrian; when the police made use of the Calderari (q. v.) to suppress the Carbonari; when Medici raised the land tax to thirty-five per cent. on the income, and, in consequence of the concordate with the pope, re-established forty-two monasteries; and the success of the Spanish constitution appeared to favour the plans of the Carbonari, who then numbered 642,000 members,—Michael Morelli, lieutenant of a troop of horse, and the priest Louis Minichini, ventured to commence an insurrection, with the view of obtaining a representative constitution. July 2, 1820, Morelli induced his squadron to raise the cry, "God, the king, and the constitution!" The insurgents increased, embracing both militia and regular troops, and, a day or two later, intrenched themselves in Monteforte. Several cities, as Salerno, now declared themselves for the cause of the constitution, and the soldiers refused to fight against their comrades. On the evening of the 5th, general William Pepe placed himself at the head of a regiment of dragoons in Naples, and united with the insurgents, who declared him their leader. On the following day, another regiment in Naples, which guarded the royal palace, and the civic guard, sent deputies to the king, with a petition that he would comply with the wish of the nation. On the 6th, the king issued a proclamation, declaring that he would, within eight days, present the plan of a constitution. At the same time, he appointed a new ministry. The troops were ordered to retire into their quarters; but they demanded that the king, within twenty-four hours, should accept the constitution of the Spanish cortes of 1812. Ferdinand I. resigned the royal power to the crown prince, as *alter ego* (q. v.), and the latter promised the introduction of the Spanish constitution. The king confirmed this, and promised his approbation of all the future doings of the *alter ego*, who now established a provisional junta, to which the lieutenant-general Florestan Pepe and baron David Winspeare belonged. W. Pepe, having been nominated by the vicar-general commander-in-chief of the army, entered Naples, on the 9th, at the head of the insurgents, and, on the 13th, the king and crown-prince entered the hall of the junta, to swear to observe the Spanish constitution, with certain modifications. Thus the revolution appeared to have been completed without bloodshed.

In Sicily, the revolution took an unexpected direction. When information of the revolution in Naples reached Palermo, the people immediately expressed a wish for the adoption of the Spanish constitution. It happened that, on the festival of St Rosalia, the commander of the place, general Church, an Englishman, having insulted the popular badges—the yellow cockade and the Sicilian eagle—a tumult ensued. The general saved himself by flight: all measures taken for the public tranquillity were fruitless: the people possessed themselves of the arms in the forts, broke open the prisons, murdered the prince Catolica, together with other distinguished men, and committed the wildest extravagances. A Franciscan monk, Joachim di Vaglica, placed himself at the head of the furious multitude, and put to flight the

Neapolitan troops. This happened on the seventeenth, on which day about 1500 men were killed and wounded. Thereupon general Naselli sailed for Naples with about 100 soldiers. The Neapolitans who had escaped slaughter, to the number of about 6000, were treated as prisoners. At length, a junta, established by the municipality and the heads (*consoli*) of the communities, restored order, by instituting a guard of citizens, among whom the most distinguished persons, as well as priests and monks, performed service. The persons who had been put in confinement, were sent out of the city without arms, and an amnesty was proclaimed. The junta, July 26, summoned deputies from the Sicilian cities, to meet in a national assembly at Palermo; but Messina and Catanea refused to send any. The junta, at the same time, sent deputies to the government at Naples, to treat concerning the independence of Sicily, and an alliance between the two nations; but, on information of the events of the 17th, all the Sicilians in Naples were declared prisoners of war, to protect them from the fury of the people; and it was determined to reduce Palermo by force, where the junta, though they had concluded to acknowledge king Ferdinand, still insisted on a separate parliament for Sicily. In the mean time, a civil and guerilla war had broken out in Sicily, because particular towns, as Messina and Trepani, opposed the cause of independence. After general Florestan Pepe, with 4000 men, had landed in Sicily, Sept. 2, other cities likewise declared for Naples, and the troops of Palermo were almost everywhere beaten. About the 20th, a treaty for the submission of Palermo was concluded; but the monk Vaglica instigated the people to rebel, removed the junta, and formed another government, under the administration of the prince of Palermo, so that hostilities recommenced. At length, a capitulation took place, Oct. 5, according to which, a majority of the Sicilians were to settle the question relating to the national parliament, and the Neapolitans took possession of the city and the forts. Florestan Pepe allowed a general amnesty, at the same time proclaiming the Spanish constitution, and appointed another junta. But the parliament assembled at Naples rejected this arrangement, and sent general Coletta, with 5000 Calabrians, to Palermo, to supersede Pepe. He disarmed the inhabitants, and imposed upon them, as a punishment, the expenses of the war,—a fine of 90,000 *oncette*. The united parliament, consisting of deputies from Naples and Sicily, was opened, Oct. 10, by the king in person, and party spirit soon mingled in the new order of things. The Carbonari saw themselves surrounded by secret enemies, particularly the revived Calderari, who were joined by all the discontented, and the ministers became objects of suspicion. The monarchies of Europe would not sanction the forcible degradation of the royal power, least of all Austria, which had received a formal assurance of the continuance of monarchy in the kingdom of the Two Sicilies, and the non-introduction of the representative system. The powers of the first rank therefore declined receiving the new ambassadors from Naples, and, Aug. 25, Austria proscribed the Carbonari of the Lombardo-Venetian kingdom. The forces of the Neapolitan government consisted of 52,000 troops of the line, supported by 219,000 movable national guards, and the standing national guards amounted to 400,000 men. There were also 10,000 *gens d'armes*, and men employed to guard the coasts; but the spirit of the regular troops was not to be depended on. Many officers left the service, and ill-will arose between the soldiers and citizens, which was increased by the privileges granted to the militia. The administration of the government was interrupted, and the distrustful people did not share the enthusiasm of their orators. The deficit in the revenue made a loan of 1,500,000 ducats from Parisian bankers necessary. The new fabric of government had no firm foundation to support it in a contest with Austria, which was collecting an army of 80,000 men, under general baron Frimont, in Upper Italy. Russia and Prussia made common cause with Austria; and, at the congress of Troppau, where the emperor of Austria arrived, Oct. 18, the emperor Alexander, Oct. 20, and the king of Prussia, Nov. 7, together with their ministers of state, and several ambassadors, the principle of armed interference in the internal affairs of a state, to support the (so called) legitimate authority, and the monarchical principle, in Europe, was first declared and acknowledged; but the application was determined on at Laybach. At Troppau, the three monarchs wrote, with their own hands, to the king of Naples, Nov. 20, to invite him to Laybach. The king of France also advised him to take this step. The appearance of an English and French squadron, at this time, in the roads before the harbour of Naples, to protect the royal family, in case of urgent danger, excited distrust and alarm in one party, and hope and joy in the other. The hall of the parliament, and the lodges of the Carbonari, resounded with heroic and patriotic speeches. There appeared to be a universal confidence in victory: none dared to utter opposite sentiments. Volunteers collected, and oath upon oath was taken. The king, Dec. 5, after receiving the letter of the monarchs assembled at Troppau, determined to go to Laybach, and signified this to the parliament, Dec. 7; whereupon this body declared that they could not consent to his journey, unless it was undertaken to obtain acknowledgment of the constitution sworn to. At last the king declared, on the 10th, that his participation at Laybach had no other end than to maintain the Spanish constitution, as sworn to, and to prevent war. The ministers now resigned, and the king named others. The king sailed on the 13th, with his wife, the duchess of Floridia, in a British ship of the line, landed, on the 19th, at Leghorn, and went through Florence to Laybach, where he arrived Jan. 8, 1821. The crown-prince took the constitutional oath as regent in the parliament, at Naples, on the 18th. The parliament, Dec. 19 and 21, decreed the abolition of all feudal burdens, services, &c. Entails were likewise destroyed. The army consisted of three divisions, in three important situations, the first on the road to Itri, the second in the pass of San Germano, and the third, under general William Pepe, on the heights of Abruzzo. They formed, with the garrisons, a body of 54,000 troops of the line, and from 50 to 60,000 militia, national guards, and volunteers. A small squadron of frigates and gun-boats was destined to intercept the supplies of the Austrians, in the Adriatic sea. For months before the actual commencement of the war, a general enthusiasm was manifested for liberty and the defence of the country. On the arrival of the king in Laybach, where the emperor of Austria had arrived, Jan. 4, and the emperor of Russia, Jan. 7 (the king of Prussia had returned from Troppau to Berlin, Dec. 21), he found the congress determined to acknowledge nothing which had happened in Naples since July 5. Austria, for the security of its own power in Italy, promised the aid of her troops to carry into effect the secret treaty concluded with the king of the Two Sicilies against the introduction of the representative system. By the treaty of Feb. 2, concluded in the name of the three courts of Vienna, Petersburg, and Berlin, an Austrian army was to be furnished to the king, to be supported by him, from the time of its passage over the Po, for the space of three years, the period during which it was to remain in the kingdom. On the 9th, the ministers of the three great powers announced to the regent that an Austrian army was approaching the borders, to take possession of the kingdom, either peaceably, or by force; and that, should it be driven back, a Russian army was ready to support it. William Pepe now summoned to arms all the volunteers and militia, under their ancient names, legions of the Bruttii, Samnites, &c., and reported that he had assembled a body of 150,000 men, badly clothed, indeed, and worse armed. Meanwhile, baron Frimont (q. v.), at the head of an Austrian army, had passed the Po, Feb. 5, and advanced from Bologna, on the two principal roads, on the right through Tuscany and the States of the Church, and on the left through the legations and the Marks, towards Abruzzo. A small Austrian squadron, under the command of the marquis of Paulucci, lay, prepared to sail, in the harbour of Ancona. A proclamation from king Ferdinand, at Laybach, Feb. 23, announced to the army that he should return to his kingdom, and commanded his subjects and troops to assist the Austrian army, which was advancing to Naples for the protection of the true friends of their country and the faithful subjects of the king. He afterwards proceeded to Florence. The frontiers of Naples were guarded with care: from Gaeta to the Apennines, was protected by Carascosa, who was stationed, with the best troops, on the road from Rome to Naples by San Germano, which was made impassable. William Pepe defended Abruzzo, which was guarded by rocks, defiles, and mountain streams. The head-quarters were at Aquila. From hence, Pepe, in order to anticipate the attack of the Austrians, sallied forth, Feb. 21, into the Roman territory, occupied Rieti, and pressed forward, even to Terni; but a body of 2500 Austrian cavalry from Viterbo having arrived at the bridge of Otricoli before him, he left Terni, and his position at Rieti, without firing a shot. Frimont, hereupon, on the 24th, fixed his head-quarters at Foligno. Hence the Austrians spread the royal proclamation of the 23d, and Frimont, at the same time, issued one of his own, declaring to the Neapolitans that he came as a friend, and would exact contributions from no place excepting those where the will of the king was opposed. This dissolved the slight band of connexion among the militia, already discouraged by want of ammunition, food, and clothing, and entire battalions now dispersed. General Pepe, March 7, with 10,000 men, attacked the vanguard of the Austrian army, but was defeated; whereupon his troops fled in disorder to the mountains; so that, at ten o'clock in the evening of this day, the Austrians entered Cività Ducale, together with the fugitives. On the same day, a body of 3000 men, advancing from Leonessa, was put to flight near Lugo. These two battles on the 7th, the first and last of the campaign, cost the Austrians hardly sixty men, and decided the revolution. As the Austrians continued the pursuit on the 9th, the Neapolitans evacuated Velino, and the strong castle of Antrodocco, the important pass at Madonna della Grotte, and that at St Thomas, so that the Austrians, on the evening of the 10th, occupied Aquila. Thus the war ended, without the army under Carascosa, on the Garigliano, having made a movement. General Pepe could not rally the scattered forces, and he hastened to Naples. The Austrians marched from Abruzzo to surround the right wing of the army on the Garigliano. Carascosa immediately left the stations of Itri, Frondi, and San Germano. The militia now began to disperse in this quarter also, so that the regent, who was in Capua, returned to Naples, where fear and confusion prevailed, in consequence of the news received from Abruzzo. All measures for the continuation of the contest were baffled by the rapid advance of the Austrians. At length, parliament, March 12, besought the regent to act as mediator between the nation and the king. The king, however, professed himself unable to give any promises concerning the future, or to stop the march of the Austrians. On the farther advance of the Austrians, Carascosa's army dispersed. The militia returned home, and the soldiers of the line joined the Austrian troops. The royal guard alone remained with general Carascosa, and occupied Capua, tearing off the national cockade, and returning to their allegiance. Thereupon the truce requested by Carascosa was signed, March 20, and Capua, as well as the remaining places, were taken possession of by the Austrians, in the name of the king of Sicily. The Carbonari now meditated a mountain and guerilla warfare, when the capitulation of Naples, including the strongholds of Gaeta and Pescara, concluded the 23d, extinguished the last spark of the revolutionary fire. The great lodge of the Carbonari was dissolved. William Pepe, and the remaining leaders of the insurrection, received permission to leave the country. The parliament separated the 24th, and, a few hours after, the Austrian army marched into the capital. The regent, with his family, went to Caserta. The king solemnly entered Naples, May 15. He had already, while at Florence, appointed a provisional government, which now abolished the revolutionary institutions, restored the old forms, dissolved the Neapolitan army, and prosecuted the authors of the insurrection. Divisions of the Austrian army, which occupied Sicily in the beginning of June, first restored quiet in 1822, in the provinces (where Morelli, Lorenzo de' Conciliis, and Minichini wished to excite a guerilla war), after the people of both kingdoms had been disarmed. General Joseph Rossarol excited new commotions in Sicily, by proclaiming a republic at Messina; but his plan to do the same in Calabria failed. The troops which he had instigated to revolt submitted to the king, and nothing remained for him but flight into Spain. Thus ended the revolution. For further information, see *Sicilies, Kingdom of the Two.*

NAPLES YELLOW, a dye, is prepared by exposing lead and antimony with potash to the heat of a reverberatory furnace. It stands tolerably well, but turns black upon the contact of iron. A native pigment of this kind is also obtained from a species of lava.

NAPOLEON BONAPARTE. See *Bonaparte.*

NAPOLI DI MALVASIA. See *Monembasia.*

NAPOLI DI ROMANIA, or NAUPLIA; a city and port of the Morea, on the eastern coast of a small peninsula, on the gulf of Nauplia or Argolis. The harbour is capable of accommodating 600 ships. Population, before the revolution, 10,000; at present, about 5000. The Venetians fortified the place so strongly, on Vauban's system, that it can only be reduced by famine. Among the outworks are Palamidi, or Upper fort, which commands the lower town, and Albanitika, or Lower fort, in which are the chief batteries towards the gulf. The only approach by land is a road enclosed by the sea and by rocks, and which is swept by the batteries of Palamidi, and the walls and bastions of the lower town. It was taken possession of by the Turks in 1715. During the Greek revolution, it was first reduced by the Greeks (1823), and, in April, the first regular Greek congress was held there, and, in 1824, it became the seat of the government. Ibrahim advanced towards Napoli in 1825, but, being repulsed in the battle of the mills, abandoned the intended attack. See *Greece, Revolution of.*

NARBONENSIS. See *Gaul.*

NARBONNE (*Narbo-Martius*); a city of France, in the department of the Aude, seven miles from the gulf of Lions, with which it is connected by the canal of Narbonne; lat. 43° 11′ N.; lon. 3° 0′ E.; population, 10,097. The streets are narrow and crooked, the houses badly built. The archiepiscopal palace, a sort of fortress, with square towers, and the cathedral, are the most remarkable buildings. There are several churches, hospitals, and public establishments here. Narbonne was one of the oldest cities of Gaul. In 118, a Roman colony was established there. It became the capital of Gallia Narbonensis, and was ornamented with splendid buildings, of which some fragments only are still to be seen. Simon de Montfort demolished the walls in the war against the Albigenses: the present walls were built by Francis I. The archbishopric of Narbonne has been merged in that of Toulouse.

NARBONNE-LARA, Louis, count de, born at Colorno, a place in the duchy of Parma, in 1755, went to France in 1760, was educated at court, entered the military service, and, in 1785, was colonel of the regiment Angoumois. He was afterwards employed in the war office, and, having embraced the national cause in the revolution, was named commander of the national guards of the department of the Doubs. In 1794, he was appointed *maréchal de camp* by the assembly, and, at the end of that year, became minister of war. By his influence, three armies were organized, under the command of Rochambeau, Luckner, and Lafayette. In 1792, he was removed from his post in the ministry, and he immediately joined the army. After the 10th of August, he was outlawed, and owed his safety to the friendship of Mme. de Staël. Narbonne retired to England, and used every exertion to save the king. In 1800, he received permission to return to France, and, in 1809, was named general of division. He was, not long after, appointed minister plenipotentiary to the court of Munich, and aid-de-camp of Napoleon. In this capacity, he made the campaign of 1812, was sent ambassador to Vienna, in 1813, and, in the same year, died at Torgau, of which place he had just been appointed commander.

NARCISSUS, or DAFFODIL; a beautiful and favourite genus of plants, belonging to the natural family *amaryllideæ*, and to the *hexandria monogynia* of Linnæus. The species are chiefly natives of the south of Europe, and the neighbouring parts of Africa and Asia. They have been cultivated, from remote antiquity, on account of the elegance of their flowers, which vary in colour, in the different species, from snow-white to the deepest yellow, and, besides, give out a delightful fragrance. On account of their easy culture, they are common in the flower-gardens, and have produced numerous varieties. The root is a tunicated bulb. The leaves are linear, about as long as the stem, flat, or slightly canaliculate. The flowers are terminal, solitary, or in a cluster; never upright, but always inclining in one direction. Previous to their expansion, they are contained in a membranous spatha. The corolla is double, the outer envelope consisting of six petaloid divisions, while the inner is cup-shaped, with the margin entire, or variously indented, in the different species. On this cup depends much of the beauty of these flowers; and it disappears on doubling them, which operation, unfortunately, is very easily accomplished.

NARCISSUS; 1. according to mythology, the son of the river-god Cephisus and the nymph Liriope, or, according to a less common account, Liroessa. Tiresias the Seer predicted that he would live to old age, if he should not become acquainted with himself. The surpassing beauty of the young Narcissus excited the love of all the maidens and nymphs. Echo pined away to a mere voice, because her love for him found no return. Being heated one day in the chase, he went to drink from a fountain, and there saw, for the first time, the reflection of his own beauty. Nothing could turn the unhappy youth from this fountain. His raging passion for himself destroyed him; and the compassionate gods transformed him into a yellow-leafed flower, which still bears his name. Such is the account which Ovid gives, in his Metamorphoses (lib. iii. 339—510.) The unhappy fountain, in which Narcissus saw himself, has since been shown at Thespiæ, in Bœotia—a country where, according to the accounts of travellers, these beautiful flowers still abound. For another Narcissus, see *Messalina*.

NARD (*νάρδος*, *nardus*), among the Greeks and Romans; a sort of aromatic oil; and also a sort of plant. Pliny mentions several species of the latter. The ancients were accustomed to anoint themselves with nard, at their feasts. In the Scriptures, the use of it is also mentioned (*John* xii. 3, and *Mark* xiv. 3), where different substances seem to be intended.

NARDINI, Pietro, one of the first violinists of his time, was born at Leghorn, in 1725, studied under Tartini at Padua, and soon became the most distinguished pupil of that eminent artist. In 1762, Nardini was placed at the head of the chapel in Stuttgard; but returned to Leghorn, in 1767, and composed most of his works after this period. In 1770, he went to Florence, as first violinist in the chapel of the grandduke of Tuscany, and died in that city, in 1796. His compositions are of a grave character, and must be executed in the spirit of the Tartini school.

NARRAGANSEK BAY intersects the state of Rhode Island, and is about twenty-eight miles long, and ten miles broad. Its entrance extends from point Judith, on the west, to Seekonnet rocks, on the east; and the northern termination is at Bullock's point, five miles below Providence. It receives Providence river on the north, and includes the islands of Rhode Island, Canonnicut, Hope, Patience, and several others. It affords capacious harbours, and is navigable at all seasons.

NARRAGANSETTS; one of the five principal tribes of Indians inhabiting New England at the time of the first settlement of the English colonies. They occupied a portion of the southern part of the country around Rhode Island. A small remnant of them still resides near Charleston, Rhode Island.

NARROWS, The; a channel between Long Island and Staten island, connecting New York bay with the Atlantic, nine miles south of New York. The channel is nineteen hundred and five yards wide, and is well defended by forts and batteries.

NARSES; a eunuch of the court of the emperor Justinian I., at Constantinople. The place of his birth is unknown. He so ingratiated himself with the emperor, that he appointed him his chamberlain and private treasurer. In 538, he was placed at the head of an army, destined to support the general Belisarius in the expulsion of the Ostrogoths from Italy; but the dissensions which soon arose between him and Belisarius occasioned his recall. Nevertheless, in 552, he was again sent to Italy, to check the progress of Totila the Goth. After vanquishing Totila, he captured Rome. He also conquered Tejas, whom the Goths had chosen king in the place of Totila, and, in the spring of 554, Bucellinus, the leader of the Alemanni. After Narses had cleared nearly all Italy of the Ostrogoths, and other barbarians, he was appointed governor of the country, and ruled it fifteen years. During this time, he endeavoured to enrich the treasury by all the means in his power, and excited the discontent of the provinces subject to him, who laid their complaints before the emperor Justinian II. Narses was deposed in disgrace, and sought revenge by inviting the Lombards to invade Italy, which they did in 568, under Alboin, their king. Muratori, and other authors, have doubted whether Narses was concerned in the invasion of the Lombards. After his deposition, he lived in Naples, and died, at an advanced age, at Rome, in 567.

NARUSZEWICZ, Adam Stanislaus, a Polish poet and historian of eminence, born in 1733, was descended from an ancient Lithuanian family, and entered, in 1748, the order of the Jesuits. After a journey through Germany, France, and Italy, he was made superintendent of the *collegium nobilium* of the Jesuits at Warsaw. After the abolition of his order, the king engaged him, in 1773, to write a detailed account of the first partition of Poland. His work, of which nothing has ever appeared in print, pleased the king so much, that he encouraged him to write a complete history of Poland. This work is distinguished for its acute criticism, extensive reading, and concise and unadorned style, after the manner of Tacitus, and is the most important that has ever appeared on the history of Poland. Unfortunately it is incomplete. The first volume, intended to embrace the earliest and most uncertain periods, and to be published after the other volumes, never appeared. Naruszewicz left a collection of materials for this work, in three hundred and sixty folio volumes, extracted from public and family archives, and divided according to the years of the reigns of the different kings. They were put into the hands of the famous Thaddæus Czacki, the author of an excellent work on the Lithuanian laws, who undertook to continue the history. As a poet, Naruszewicz distinguished himself in several styles, particularly in the idyl. He also wrote a Polish translation of Tacitus (1775, 4 vols.), in which he has imitated the brevity of the original with surprising success; a Biography of the Lithuanian General John Charles Chodkiewicz (Warsaw, 1805, 2 vols.); Tauryka, or History of the Tartars; and other works. He died of a broken heart, occasioned by the fate of his unhappy country, at Warsaw, 1796, and was lamented, both for his talents, and his noble and philanthropic character.

NARVA, or NARWA; a town and fortress on the west bank of the Narowa, which flows from lake Tchudskoi, or Peipus, into the gulf of Finland; population, 3580, principally Germans, mostly engaged in making nails, and sawing timber; lat. 59° 22′ N.; lon. 28° 14′ E.; seventy-five miles southwest of St Petersburg. Its commerce is considerable; the exports are timber and boards, flax, hemp, corn, &c. The fisheries; particularly of salmon, are important. Narva is celebrated for the great victory gained by Charles XII. (q. v.), in its vicinity, over the Russians, in 1700. The latter retook the place by storm, in 1704.

NARVAEZ, Pamphila de, born at Valladolid, came early to America, which was then just discovered, served (1510) under Esquibal, governor of Jamaica, and was afterwards commander of the expedition sent against Cortez by Diego de Velasquez, governor of Cuba. (See *Cortez.*) He sailed, in 1528, with four hundred men, intending to establish a colony in Florida, discovered the bay of Pensacola, and, having marched into the country, was never heard of more.

NARWHAL (*monodon*, L.). This extraordinary marine animal, of the whale tribe, which is also known under the name of *sea-unicorn*, is of considerable size, attaining the length of from fifty to sixty feet. The narwhal is distinguished from the other whales by having no teeth, properly so called, and in being armed with a formidable horn, or defence, projecting from the upper jaw. Sometimes the animal is provided with two of these formidable weapons; but, in most cases, it is single, and is attached to the left side. It is about six to ten feet long, spirally striated, of a white colour, harder and heavier than ivory. This horn, or tooth, was, at one time, in high repute in Europe, not only as a substitute for ivory, but also for its supposed medicinal powers, as an antidote against poisons, and in the cure of malignant fevers. From the accounts of voyagers, it appears that, notwithstanding this weapon of defence, as well as the strength and velocity of the animal, the narwhal is one of the most peaceable inhabitants of the ocean. It is termed by the Greenlanders the *forerunner of the whale*, as, whenever it makes its appearance, that animal soon follows. Cuvier is of opinion that there is but one species, those recognised by Lacepede and others being only varieties.

NASEBY; a village in Northamptonshire, England, twelve miles from Northampton. In 1645, Cromwell entirely defeated Charles I. in the vicinity. See *Cromwell.*

NASH, Richard, commonly called *Beau Nash*, is known to fame as the celebrated master of fashion in the watering place of Bath in England; and his fortunes are well calculated to point a moral for the place of which he was the hero. He was born in 1674, at Swansea, in Glamorganshire, and was intended for the law, but entered the army; being disgusted at the discipline and his subordinate rank, he soon forsook it, and took chambers in the Temple. Here he devoted himself entirely to pleasure and fashion; and when king William visited the Inn, he was chosen master of the pageant with which it was customary to welcome the monarch. So pleased was William with the entertainment, that he offered him the honour of knighthood; but Nash refused it, saying, "Please your majesty, if you intend to make me a knight, I wish it may be one of your poor knights of Windsor, and then I shall have a fortune at least equal to support my title." In 1704, he was appointed master of the ceremonies at Bath, and immediately instituted a set of regulations as remarkable for their strictness as for their judicious adaptation to the wants and society of the place. While in the plenitude of his power and popularity, Nash lived in the most splendid style, supporting his expenses by a long run of success at the gaming-table. His dress was covered with expensive lace, and he wore a large white cocked hat. The chariot in which he rode was drawn by six gray horses, and attended by a long retinue of servants, some on horse, others on foot, while his progress through the streets was made known by a band of French horns and other instruments. His common title was the *king of Bath*; and his reign continued, with undiminished splendour, for more than fifteen years. His health then began to decline, and his resources grew less plentiful. As the change in his spirits and circumstances became more evident, his former acquaintances gradually forsook him, and he died at the age of eighty-eight, in comparative indigence and solitude. He was buried, however, with great magnificence, at the expense of the city; and his epitaph, a neat tribute to his memory, was written by doctor Harrington

NASSAIRIANS. See *Nosairians.*

NASSAU; a sovereign duchy of the German empire, bordering on the Prussian province of the Lower Rhine, Hesse-Darmstadt, and Frankfort

The Rhine runs along its southern border, and receives the Lahu from the duchy. The superficial area is 1759 square miles, with a population of 320,470, of whom a little more than one half are Protestants. The court and about one third of the people are Calvinists; but since 1817, the Lutherans and Calvinists have been united under the title of the *Evangelical Christian church*. The face of the country is rather uneven; the soil is fertile. Hochheim, Rudesheim, Johannisberg, Marcusbrunnen, Asmanshausen, &c., yield the finest Rhenish wines. There are mineral springs at Wiesbaden (the capital), Niederselters, Ems, Schlangenbad, Geilnau, &c. The revenue of the duchy is estimated at 1,810,000 guilders; the debt at 5,000,000: the contingent to the army of the confederacy is 3028 men. The duke has the thirteenth vote in the diet, with the duke of Brunswick; and in the *plenum* he has two votes, and the fourteenth seat. The present duke of Nassau, William (born 1792), resides in Wiesbaden, and in the beautiful castle Biberich. The estates, by the constitution of 1815, are composed of two chambers —that of the nobles, consisting of the princes of the blood, six hereditary members, and six members elected by the nobility, and that of the deputies of the country, twenty-two in number. The founder of the house of Nassau appears to have been Otho of Laurenburg, brother of Conrad I. (in the tenth century). His descendants afterwards took the name of Nassau, from a castle of that name. In 1255, two lines were formed, that of Walram, or the elder line, and that of Otho. From the former is descended the present ducal house of Nassau, which received the ducal title from the confederacy of the Rhine, which it helped to establish, in 1806. From the younger line is descended the reigning house of Holland, or of Orange-Nassau. See *Netherlands*.

NATCHEZ; once a powerful tribe of Indians, residing on the eastern side of the Mississippi, in the western part of the state of the same name, whose melancholy fate has derived a new interest from the muse of Chateaubriand. According to their own traditions, the Natchez had emigrated from the south, and their manners and opinions resembled, in many points, those of the civilized tribes of that part of the country. Inhabiting a delightful country, under a mild climate, they were a polished people, in comparison with their savage neighbours. They had laws, an established worship, a temple dedicated to the Great Spirit, on the altar of which burned a perpetual fire, and chiefs who derived their origin from the sun. They had treated the French colonists with great kindness, and had been courted by them on account of their power. (See *Louisiana*.) A quarrel having taken place between a French soldier and an Indian, the latter was shot by the garrison of fort Rosalie (a French post in the territory of the Natchez), and the offenders were left unpunished. The consequence was a war, which was, however, terminated by the influence of one of the principal Indian chiefs. Soon afterwards (1723), French troops were secretly introduced into the settlement, and great numbers of the unsuspecting Natches massacred. To this outrage was added another, which stung the Indians to madness: the French selected, as a site for a town, a spot (two miles from the present town of Natchez) occupied by a large and ancient Indian village, and ordered the huts of the natives to be removed. The latter formed a plan of vengeance: they attacked the fort by surprise, and put to death the garrison. They also destroyed all the French settlements in that part of the country. A powerful force was sent against them, and, unable to resist it, they retired silently in the night, crossed the Mississippi, and fortified themselves on the Red river, not far from Natchitoches. Pursued thither, they attempted to cut their way through the enemy; the greater part of them fell in the attempt; the males who survived were sold, as slaves, in St Domingo; the women were enslaved at home. Thus perished the tribe of the Natchez.

NATIONAL ASSEMBLY, and NATIONAL CONVENTION. See *France*.

NATIONAL DEBT. See *Public Debt*.

NATIONAL DOMAINS (*biens nationaux*); the name given to the church lands which, during the French revolution of the last century, were declared the property of the nation, and sold as such. The lands of emigrants, and the crown lands, were also declared national domains. The national domains were created by several decrees of the national assembly, occasioned by financial embarrassments. The king sanctioned a decree of the national assembly, of Nov. 2, 1789, declaring the church lands (estimated at above 3,000,000,000 of livres) at the disposal of the nation; and a decree of Dec. 19, 1789, converting the crown lands, with the exception of nine residences, into national domains. Another law authorized the sale of this public property, to the amount of 400,000,000, and ordered the issue of assignats (q. v.) to that amount, which, on Mirabeau's motion (April 17, 1790), were made a circulating medium. Not long before (February 13), the national domains were increased by the suppression of the monasteries, and, March 18 of the same year, it was decreed that a certain amount should be sold to each municipality—an important decree, which attached all the cities and towns to the new order of things. Finally (before Necker's resignation), June 29, all the national domains, except the crown lands (see *Domains*) and forests, were declared alienable. At the same time, the amount of the assignats was increased (Sept. 22, 1790) to 1,200,000,000, and gradually rose to nearly 40,000,000,000 of livres (in February, 1796). This policy made most of the purchasers of the national domains zealous supporters of the revolution. But fluctuations in the value of the assignats, and great speculations in them, were the consequences of the great issue, increased by the insecure tenure of the confiscated estates of the emigrants, which had been added to the national domains by a law of July 27, 1792. In the western and southern departments, the purchase of these estates was dangerous; erasures of names from the emigrant lists were made, and those who returned received back such of their property as had not been sold. The original purchasers of national domains were, therefore, desirous to sell them again, and only the third or fourth holder considered his title secure. On the same account, they were divided and sold in parcels. Napoleon's measures, in respect to the national domains created under him, are related in the article *Domains*. When Louis XVIII. published the constitutional charter, in 1814, he declared (in article 9). *Toutes les propriétés sont inviolables, sans aucune exception de celles qu'on appelle nationales, la loi ne mettant aucune différence entre elles.* The unsold national domains were, however, restored to the emigrants, and, as they claimed the entire restitution of their estates, all the national domains began to be considered insecure, so that at least three millions of proprietors felt their property in danger—a circumstance which had no little influence on the event of March 20, 1815. It was fortunate for France that the chamber of 1816, &c., and the ministry of Louis XVIII., recognised the rights of the holders of the national domains in the spirit of the charter. Since that time, the national domains have been separated from the crown lands, and the sale of the former has been permitted only in special cases, by particular laws; for instance, in order to pay the sum exacted by the allies, and to create an entailed estate for the duke De Richelieu. For the indemnification of the emigrants, see *Emigrants*, and *France*.

NATIONAL GALLERY. This splendid English collection comprises the greater part of the pictures which belonged to the late Mr Angerstein. They were purchased, by order of George IV., for forty thousand pounds, as the foundation of a national gallery, and were first exhibited to the public in May, 1824. Amongst them are the Village Festival, by Wilkie; *Marriage à la Mode*, by Hogarth; Christ raising Lazarus, by Sebastian del Piombo; the Woman taken in Adultery, by Rembrandt; Julius II. by Raphael; and beautiful specimens of Cuyp, Vandyck, Annibal Caracci, Claude, G. Poussin, Rubens, Titian, Coreggio, N. Poussin, Domenichino, and Velasquez.

NATIONAL GUARDS. See *Guards*.

NATIONAL INSTITUTE. See *Institute, National*.

NATIONS, LAW OF. By *national law*, or, as it is more commonly called, the *law of nations*, we understand that portion of public law which concerns the rights, duties, and obligations of nations. This is a very comprehensive subject, and can only be glanced at in this place, since a full and accurate examination would occupy volumes. Nations are considered as moral persons, having duties to perform, as well as rights to enforce, and are bound to the observance of the great principles of justice, which are applicable to the relations which subsist between each nation and its own subjects, and between each nation and every other nation. Vattel has defined the law of nations to be the science which teaches the rights subsisting between nations or states, and the obligations correspondent to those rights. But it is obvious that he here speaks of one branch only of that law, and that he altogether passes by another most important branch; namely, the rights and obligations which subsist between the nation and its own subjects. It would be more correct, therefore, to divide it into two great leading heads, namely, the *internal law of nations*, or that which arises from the relations between the sovereign and the people, and the *external law of nations*, or that which arises from the relations between different nations. The former may be properly called the *public law of the state*, whether it arise from the principles of natural justice, or from positive institution. The latter is appropriately called *international law*, and is again divisible into two heads, the one which regulates the rights, intercourse, and obligations of nations, as such, with each other; the other, which regulates the rights and obligations more immediately belonging to their respective subjects. Thus the rights and duties of ambassadors belong to that head which respects the nation in its sovereign capacity; and the rights of the subjects of one nation to property situated within the territory of another nation, belong to the latter head. The former is frequently denominated the *public law of nations*, and the latter the *private law of nations*. The great foundation on which the law of nations rests, is the law of nature, or that system of principles which is deduced by human reason from the nature of man, and his social obligations, for the direction and government of human societies. Not that every principle of natural law is applicable to nations, in the same way and manner as it is to individuals; but that nations, being moral persons, are bound by the same principles, so far as they admit of a just application to them. And among Christian nations, these principles are illustrated and enforced by the superior sanctions and doctrines of divine revelation. It is obvious, that the principles of natural law are not, of themselves, sufficient to regulate, in a fixed and definitive manner, all the complicated relations of society; for, in many cases, no rule is, or can be, furnished by human reason, which is, necessarily, the sole and true rule to govern them. There are many cases in which the rule is a matter of indifference, or of convenience, or of arbitrary regulation; and every nation is free to adopt or reject the rule which is framed by another. There are, again, other cases, in which a nation may justly yield up its own strict rights, or modify them, without any departure from the principles of justice, or moral obligation. The law of nations may, therefore, be divided into two great classes of principles, namely, those which arise from natural or universal law, and those which are of mere positive institution. The former is denominated the *universal law of nations;* the latter, the *positive law of nations*. And the latter is again divisible into the *customary law*, or that which arises from the silent consent of nations, as evidenced by general usages and customs, and habits of intercourse; and the *conventional law*, which arises from express compacts, or treaties between nations, or in a particular state, from the fundamental constitution of such state. We do not propose, in this place, to enter upon any theoretical investigation of the principles of the law of nations, but merely to present a practical summary of the most important of them. Our object is to furnish a guide to the actual state of this branch of public jurisprudence, rather than an exposition of the reasons on which it is founded. In considering this subject, it is our design to treat, first, of the internal law of nations, or that which concerns a nation considered by itself; and, secondly, the external law of nations, or that which concerns its intercourse and relations with other states.

1. *Nations considered in themselves.* When any society of men, or body politic, is united for the purposes of government, and for mutual protection, we are accustomed to call such society, or body politic, a *state*, or *nation*. To every state, or nation, we ascribe the attributes of sovereignty, independence, and equality with every other. Every nation which governs itself, without dependence upon any foreign power, is deemed a sovereign state. By *sovereignty*, is meant the absolute right to exercise supreme power, without any responsibility to any superior, except God. This is sovereignty, in its largest sense; and in this view it is despotic and uncontrollable. But it must not be understood that the possession of such an absolute, despotic sovereignty, is indispensable to the existence of a nation, or that it is ordinarily conferred, or proper to be conferred, upon its own functionaries. All that is meant is, that it is competent for the people composing any state, or nation, to exercise such power, or to confide it to their public functionaries; and the exercise of of it by either cannot, properly, be questioned by any foreign state or government. Theoretically speaking, this absolute sovereignty may be said to be inherent in every nation, as a potential attribute; but, practically speaking, it rarely has any existence, as an actual attribute, in the organization of any government. The forms of government are divisible into three sorts: democracies, or governments by the people; aristocracies, or governments of a select few; and monarchies, or governments of a single head; and each of these may be variously mixed up with the others, so as to form a complex government, such as a representative democracy, or republic, or a limited monarchy, or a limited aristocracy. In a pure despotism, indeed, all sovereign power is concentrated in the head; but such a government rarely exists; for, in governments usually styled despotic,

the customs and institutions of the society, and the habits, and manners, and opinions of the people generally, interpose some indirect checks, and compel the sovereign to yield a practical obedience to some limits prescribed to his prerogatives. If he does not, there is often an ultimate resort of popular or aristocratical power, which, by cutting him off, administers an effectual, though sanguinary remedy. In free governments, this despotic sovereignty is a mere residuary power in the people, if it can be said to have any positive existence at all. It never is confided to any public functionaries, except for transitory purposes; and it is contrary to the theoretical principles of such governments that it should be intrusted, as a permanent attribute, to the legislative, executive, or judicial departments. Nations, therefore, in a just sense, are deemed sovereign, not so much because they possess the absolute right to exercise, in their actual organization, such transcendent and despotic authority, but because whatever they do exercise is independent of and uncontrollable by any foreign nation. The sovereignty of many nations is, in its actual organization, limited by their own constitutions of government; but, in relation to all foreign states, the sovereignty is, nevertheless, complete and perfect. And a nation may even have a limited connexion with or dependence upon other nations, and yet retain a general sovereignty, in all other respects, and thus entitle itself to be deemed a sovereign nation, if it still possesses the power to govern itself by its own authority and laws. In respect to each other, then, nations possessed of sovereignty, in the limited sense above stated, are deemed equals, and are entitled to the same general rights and privileges. Relative strength is of no consequence; it neither confers nor abstracts any sovereign power. Relative weakness creates no dependence, and, in a just sense, compels to no sacrifice of national attributes. In respect to its own internal concerns, every nation possesses general and supreme authority. How that authority shall be exercised, and by whom, depends upon the particular constitution of each state, and is subject to the modification and control of the national will, expressed in such manner as the people prescribe. The authority of the nation over all its members is, by the very act of association, deemed, in all that concerns the general welfare of the nation, complete and supreme. All the members are bound to obedience and allegiance; and, in return, the nation is bound to protect and preserve its members.

It may be proper, however, to express the rights and duties of a nation in a more exact form than can be communicated in such general propositions. 1. Every nation possesses full jurisdiction to create, alter, abolish, and regulate its own form of government, in such a manner as to provide, from time to time, for its own safety and happiness. 2. Every nation possesses an exclusive jurisdiction, within its territory, over all persons and things therein. 3. Every nation possesses a right to demand the allegiance of all its own subjects, and to bind them by its own laws, whether they are at home or abroad. 4. Every nation has a right to the temporary allegiance and obedience of all persons who are strangers and foreigners, so long as they reside within its territorial limits. 5. Every nation has a right to exercise jurisdiction, in common with every other nation upon the high seas, and in all other places not exclusively belonging to some other nation. 6. Every nation has a right to enforce its own regulations upon its own subjects, and upon all other persons sailing under its flag and protection upon the high seas, and to govern its trade thereon, not interfering with the common rights of other nations. 7. Every person has a right to hold all persons, born within its limits, and not specially exempted by the law of nations, to be its subjects, and bound thereto by natural allegiance. 8. Every nation has a right to naturalize foreigners residing within its territory, at its own pleasure; but such naturalization cannot impair or destroy the rights of other nations, to whom they may previously owe allegiance. 9. Every nation possesses a supreme legislative, executive, and judicial authority, and may confer such portion of these powers upon its public functionaries, for the purposes of its own safety, interest, and happiness, as it may deem proper. 10. Every nation has a right to acquire and hold property, as its own public domain, for public purposes. 11. The rights of persons, and the rights of property, within its territory, are subject to the control and regulation of every nation, according to its own constitution and laws. 12. The territory within the limits of every nation, not owned by any private persons, belongs to the nation in its sovereign capacity. 13. Every nation, in virtue of its eminent domain, has, in cases of necessity, and for the public safety and happiness, a right to dispose of any portion of the wealth or property of its subjects. 14. Every nation possesses the power, in virtue of its sovereignty, to punish all crimes committed against it, and to enforce all civil obligations due to it from the persons subjected to its authority. Such are some of the more important rights of sovereignty, belonging to nations.

We may now enumerate some of their duties. 1. Every nation is bound to protect the rights and possessions of its subjects against all aggressions. 2. Every nation is bound to prevent its subjects from doing any wrong or injustice to the subjects of other countries. 3. Every nation, in virtue of its obligation to preserve the peace, liberty, and happiness, of its own subjects, is bound to provide for the enactment of all good and wholesome laws for these purposes; and, especially, to provide for the necessities of the nation itself; to promote agriculture, commerce, manufactures, and all lawful pursuits, which are calculated to relieve the wants, promote the prosperity, or encourage the just enterprise of its subjects. 4. Every nation is bound to provide for the due and regular administration of justice; for the redress of wrongs; for the preservation of civil, political, and religious liberty; for the cultivation of piety and sound morals; for the suppression of vice; for public education and instruction; and for all other objects which are essential to the true interests and happiness of the people. Such, in a general view, are some of the more important duties of nations, in respect to their internal concerns.—It has been already stated that every nation possesses a right to all territory within its own limits, not belonging to private persons; and it may be added, that, as all such territory is held for the national benefit, it may be alienated, and disposed of, according to the will of the nation. All property, however acquired by the nation, is subject to the like disposition. Thus all the national revenues arising from taxation, or rents, or other income, or resources, may be applied as the nation deems proper for its own welfare. But there are many things which a nation holds for the public use and benefit, in respect to which all the subjects possess, or may possess, a common right of enjoyment. Thus rivers, lakes, and arms of the sea, within the limits of the territory of a nation, are possessed and owned by the nation, in virtue of its occupation of the adjacent country; and, until alienated, they are held for the common benefit of all the people, and may be used by all the people for the purpose of fishing and navigation. Of the like nature are roads, and highways, and canals established and supported at the expense of the nation. All these territorial rights and possessions, however, are subject to the municipal regulations of every nation, according to its own choice, and constitution of government.

2. *Of Nations, considered in Relation to each other.*—The basis, on which all the rights and duties of nations, in their intercourse with each other, rests, is the fundamental maxims, that they are all moral persons, and that each has a perfect equality, in sovereignty and social rights, with every other. They are treated as moral persons possessing a sense of right and wrong, and responsible to the common Creator for a just discharge of all the duties common to the human race. They are bound to do justice, to perform the offices of humanity, and to render mutual assistance to each other, in the same manner, and upon the same principles, that bind individuals to like duties. If there is any difference, nations are under a superior obligation to perform all social duties, because their means are more extensive, and their authority more complete, than those of individuals. Hence it is the duty of every nation to succour and assist another, that is suffering by famine, pestilence, or other calamity; to cultivate friendship and good-will towards all others; to abstain from all injury and wrong to all others; and to cherish, as far as may be, an honest and frank intercourse with all others, upon principles of reciprocal benevolence. However imperfectly these duties may, in a practical sense, be performed by nations, they are the clear result of undeniable principles of the law of nature, sanctioned and supported by the positive declarations of Christianity. The other maxim, to which we have alluded, is the perfect equality of nations, whether great or small, maritime or inland, strong or weak. In this respect, they are treated like individuals, who, however differing in capacity and strength, are deemed entitled to equal rights and privileges, in the general scale of the human race. In a just sense, then, all nations are of equal rank and dignity, although, by custom and usage, a precedency in mere matters of ceremony and courtesy is often conceded to nations which have a high antiquity, or superior renown, or uncommon power. The rights and duties of nations, in regard to each other, may be divided into two general heads,—those which belong to a state of peace, and those which belong to a state of war.

We shall first treat of those which belong to a state of peace. 1. Every nation is bound to abstain from all interference with the domain of other nations. That domain extends to every thing which a nation is in possession of by a just title, whether it be by purchase, or cession, or conquest, or by a title founded solely on a long possession. In respect to foreign nations, not only the public domain, but all the private property of the subjects of a nation, situated within its limits, is deemed the property of the nation. This right of domain is exclusive; and, consequently, no nation can rightfully exercise any jurisdiction or sovereignty within the territories of another, either over persons or things. If a nation chooses to leave some part of its territory desert and uncultivated, this does not justify any other nation in seizing upon or occupying it. But, where a desert territory has no owner, there the nation that first discovers or occupies it, is generally allowed to possess a just title to it. But if the territory, when discovered, is occupied by inhabitants, no just right exists to expel or to subdue them, upon any recognised principles of national law. Such inhabitants have just as good a title, founded upon possession, as can be claimed by any other people. 2. Where two nations border on a river, or lake, or arm of the sea, it often becomes a matter of dispute how far the limits of each extend, and how far either may exercise exclusive jurisdiction over such places. No principles can be laid down, which will embrace all cases of this sort. But as a nation may acquire exclusive dominion in a river, lake, or arm of the sea, some rules have been laid down as guides on this subject. When a nation takes possession of a country bounded by a river, it is considered as appropriating to itself the river also, if there is no adverse possession or appropriation. In such cases, a priority of possession or occupation is generally allowed to give the superior right. If a nation has long enjoyed the exclusive use of such river, lake, or arm of the sea, for navigation, fishing, &c., that is understood to strengthen its title of possession. If no priority of occupation is, or can be established, by either of two nations inhabiting the opposite banks of a river, each is considered as having an equal title; and, in such a case, the right of dominion of each will extend to the middle of the stream of the river (*usque ad filum aquæ*). Where a nation possesses the territory on both sides of a river, so far as such territory extends, it is deemed to be the owner of the river itself; but other nations, owning, in like manner, above or below, on the same river, may have a right of passage, or other servitude. In respect to the main sea, in former times, several nations laid claims to an exclusive dominion, or, at least, to a pre-eminence in and over certain parts of it. But the general doctrine now maintained is, that all nations have equal and common rights on the high sea, and they are not bound to admit any superiority there. The sea which washes the coast of a nation, to the extent of a cannon-shot, or a marine league, is now deemed to be a part of the territory of the nation, over which it may, for its own protection, exercise an exclusive jurisdiction. And, in respect to persons subjected to its laws, every nation now claims a right to exercise jurisdiction on the high seas, for the purpose of enforcing, not only the law of nations, but its own municipal regulations. 3. From the exclusive jurisdiction and sovereignty of a nation, within its domain, it follows, that no other nation has a right to punish for crimes committed by its own subjects therein. No foreign nation has a right to pursue any criminal, or fugitive from justice, therein; but its claim, if any, is a mere right to demand him from the nation itself. From this peculiar and exclusive jurisdiction, which a nation exercises within its own territory, over persons and things, other nations are accustomed, upon principles of comity and general convenience, to respect the decisions of the local tribunals, and to recognise the rights generally derived from them. It might otherwise happen that, with every change of domicil, the entire rights of property might be subjected to new litigation; and a judgment, valid where it was rendered, might be set aside by a tribunal having no competency to exercise an appellate jurisdiction. 4. Every nation has a right to regulate its own intercourse and commerce with other nations, not denying them just rights, in such a manner as is most conducive to its own prosperity and interests. It ought not, however, to restrict commerce, which is generally beneficial to all mankind, beyond what a just care of its own interests dictates. And it will not, if it be wise, impose any restrictions upon trade, which tend to a destruction of free commerce, or to create an unjust monopoly. In respect to its conduct towards foreigners, every nation seems under a moral obligation to treat them with respect, kindness, and humanity, during their sojourn within its territories. And though, strictly speaking, no foreigner has any right to claim a permanent domicil, or to exercise his trade or business within its territories, any interference with the ordinary pursuits of such persons is generally deemed a harsh exercise of power. And if a nation allows foreigners to enter into its territory, it is bound to respect their rights, so long as they conduct themselves peaceably; and if, in breach of good faith, it proceeds to punish them vindictively, when they have committed no offence, it is justly responsible for its conduct to the nation to which they belong. Foreigners, however, are bound to obey the laws of a country, as long as they reside within it, and under its protection. And as they are amenable to its laws, so they ought, in reason, to have the assistance of its courts of justice to vindicate their own rights. The property held by foreigners within a country, according to the laws, ought to be protected in the same manner as that of natives. It is a general rule among nations to regulate the descent, distribution, and alienation of immovable property exclusively by the laws of the country wherein it lies. As to movable property, it is now a common custom, and seems most reasonable and just, to allow foreigners the liberty of disposing of it by will, or otherwise, according to the laws of their own country, or of their own permanent domicil. Some governments, in the case of the death of foreigners within their territory, have exercised a very harsh right of appropriating the property left by such persons to themselves. But this exercise of right, or rather of power, has been generally discountenanced, in latter times, among civilized nations. The rights of foreigners are, however, so much a matter of municipal regulation and policy, that it is difficult to lay down more than a few very general principles on the subject. 5. How far a nation is bound to concede to others the exercise of any right, within its own territory, has been a matter of much speculation among writers on the law of nations. It has been often asked, whether a nation has a right to demand, in case of necessity, that another shall supply it with provisions, or allow it to procure necessaries therein; whether a nation may insist upon a right of passage through the territory of another nation, either for persons or merchandise; whether it may claim for its subjects a right to reside in the territories of another nation; whether it may, of right, demand from a nation the free use of a thing, within its territory, which is inexhaustible, and is of innocent use, such as of water. To all such questions there can be little more than a general reply, viz. that it is the duty of every nation to concede to the necessities of others whatever may not incommode itself, or affect its interests, or endanger its peace or prosperity. 6. The intercourse between nations can scarcely be beneficially carried on without the instrumentality of some public agents. They may have disputes to adjust, injuries to redress, rights to ascertain, mutual objects and interests to promote,—all of which may require great deliberation and many conferences. It is obviously impossible for the government of a nation to carry on its negotiations at a distance, without the aid of some public functionaries, who shall represent its sovereignty, and have authority to act in regard to its rights. Hence arises the right of every nation to send and to receive ambassadors, and other public ministers. And this right of embassy, inasmuch as its tendency is to promote justice, harmony, peace, and social virtue, among nations, has always been deemed peculiarly sacred. The law of ambassadors forms, therefore, a large head in the law of nations; and it is observed with a jealous and scrupulous care by all civilized nations. As representatives of the nation itself, ambassadors, and other public ministers, are exempted from all responsibility to the civil and criminal jurisdiction of the countries to which they are sent. Their persons are held sacred and inviolable. Their property, and servants, and retinue, enjoy a like privilege. Their houses are deemed, in some sort, asylums; and they have many privileges conceded to them, which do not belong to any other persons in the country where they reside. These rights, and privileges, and immunities, are not, however, to be considered as favours granted to the individual, but as a sovereign claim and public security insisted on by all nations, and refused by none. The peace and safety of all nations are essentially connected with the strict observance of them; and they are rarely infringed, except under circumstances of peculiar aggravation and injury. 7. It is through the medium of ambassadors, and other public ministers, that treaties, conventions, and other compacts between nations, are usually negotiated, thus forming a positive code for the regulation of their mutual rights, duties, and interests. In the modern practice of nations, such treaties and compacts are not generally deemed final and conclusive until they have been ratified by the respective governments to which the negotiators belong. When made, such treaties possess the highest sanctity and obligatory force. They are, indeed, sometimes violated; but they never can be justly violated, except in cases of great and positive wrongs on the side of the other contracting party, or from extreme necessity, or from a change of circumstances, which renders them wholly inapplicable or unjust. Many rules have been laid down for the interpretation of treaties. But they all resolve themselves, ultimately, into one great maxim, which is, that they are to be understood and construed according to their obvious meaning, and the intention of the contracting parties. Treaties may be dissolved in several ways;—first, by the voluntary assent of the parties; secondly, by a formal dissolution, pronounced by one of the parties, acting upon its own responsibility, in the exercise of sovereign authority; thirdly, by operation of law, as in cases where the contracting parties lose their distinct sovereignty, and become incorporated into a single nation; fourthly, by implication, as when new treaties are formed between the parties upon the same subject, or new alliances are contracted, which are incompatible with existing treaties. 8. As to the modes of terminating disputes between nations. These are various,—by compromise; by mediation, by arbitration; by conferences and congresses; by tacit acquiescences in the claims of the other side; and, lastly, on a failure of all these, by an ultimate resort to arms. This resort may be by a limited or by an unlimited warfare; by a limited warfare, as by retaliation, by reprisals, or other modified redress; by an unlimited warfare, as in cases of general hostilities in a public war. It is obvious, that a resort to arms can be properly had only when all peaceable means of redress have been exhausted, and for causes of an important nature.

And this leads us to the consideration of the rights and duties of nations in regard to each other, which belong to a state of war,—First, between the nations at war. The right of declaring war results from the right of a nation to preserve its own existence, its own liberties, and its own essential interests. In a state of nature, men have a right to employ force in self-defence; and, when they enter into society, this right is transferred to the government, and is an incident to sovereignty. 1. What are just causes for entering into a war, is a question which has been much discussed by publicists. It is difficult to lay down any general rules on the subject, and nations must be ultimately left to decide for themselves, when the exigency arises. In general, it may be said, that war ought not to be entered into, except for very cogent reasons, as it necessarily involves much personal suffering, and many private as well as public sacrifices. No man can look upon the conflicts of armies and navies, the pillage of cities, the devastation of provinces, and the destruction of property and of life, which it unavoidably involves, without feeling that a deep moral responsibility attaches upon the nation which undertakes it. Defensive wars are necessarily justifiable from the fact, that they involve the existence or safety of the nation and its interests. But offensive wars are of a very different character, and can be justified only in cases of aggravated wrongs, or vital injuries. 2. In respect to the mode of declaring war. It may be formal, as by a public declaration, or informal, as by actual hostilities. In modern times, nations are accustomed, generally, to make a public declaration, and to justify themselves before the world, by a manifesto of their reasons. 3. The effects of a declaration of war. The first effect is to put all the subjects of each of the nations in a state of hostility to each other. All public and all private social intercourse are suspended between them. They are not at liberty to engage in trade, or commerce, or contract with each other; and they retain the character of enemies, in whatever country they may be found. In the next place, all the property belonging to each is deemed hostile. If it be personal property, it may be captured as prize; if lands, it may be seized, and confiscated, at the pleasure of the sovereign; if it be merely in debts or stock, it may, in the extreme exercise of the laws of war, be equally liable to confiscation. In general, each nation restrains the right to make captures, and to carry on hostilities, to such persons as are in public employment, or to such as receive a public commission for this purpose. Mere private warfare is not allowed, except under many restrictions. Thus the usual modes of carrying on war are by armies, navies, and privateers, acting under the immediate authority of the government. 4. But, although the extreme rights of war are thus rigorous and oppressive, there seems no reason to exclude, even between enemies, the common duties of humanity. While the battle rages, indeed, every thing but slaughter and victory are forgotten. But, as soon as it is over, the conquerors are bound to treat the wounded with kindness, and the prisoners with a decent humanity. And they who knowingly offend, in these cases, are guilty of a gross violation of duty in the eyes of God and man. And there are some things which seem positively prohibited from their cruelty and brutal barbarity; such are the violation of female captives, the torturing of prisoners, the poisoning of wells, the use of inhuman instruments of war. 5. In time of war, there is occasionally an intercourse between the belligerents, which should always be held sacred. Thus the granting of passports, and ransom of prisoners and property; the interchange of prisoners by cartels; the temporary suspension of hostilities by truces; the passage of flags of truce; the engaging in treaties of capitulation, in cases of besieged armies or cities,—all these are matters which are held in great reverence, and demand the exercise of the utmost good faith. *A fortiori*, there should be a total absence of all fraud and stratagem, in cases where preliminary negotiations are entered into for the purpose of restoring peace. 6. In respect to captures made in war, they generally inure to the benefit of the sovereign, unless he has made some other positive distribution of them. When any conquest of territory is made, the inhabitants immediately pass under the dominion of the conqueror, and are subject to such laws as he chooses to impose upon them. Generally, it is for the interest, as it certainly is the common policy, of the conqueror to respect the rights of private persons and private property. But in strictness, his power over each is unlimited, unless so far as it may be restrained by articles of capitulation, or by moral or religious obligations. In cases of reconquest, the property, unless previously disposed of, returns to the original owner by the *jus postliminii*, in like manner as the restoration of a prisoner of war to his own country reinstates him in his prior rights. 7. There are also certain rights which war confers on the belligerents in respect to neutrals. Thus they have a right to blockade the ports, or besiege the cities, of their enemies, and to interdict all trade by neutrals with them. They have a right, also, to insist that neutrals shall conduct themselves with good faith, and abstain from all interference in the contest by supplying their enemy with things contraband of war. And if neutrals do so interfere, they have a right to punish them, either personally or by a confiscation of the property taken *in delicto*. And hence arises the incidental right of search of ships on the high seas, for the detection of contraband goods.

We next come to the consideration of the rights and duties of neutrals. A neutral nation is bound to observe entire impartiality between the belligerents. It is bound to consider the war just on each side, at least to assume it to be so, so far as regards its own conduct. It should do nothing, therefore, which favours one party at the expense of the other; although, if it has previously entered into treaties with one of them, by which it is bound to lend a limited aid, by supplying stores or troops, it is obliged to conform to its treaty obligations. This becomes often a duty full of peril and difficulty, and, in many instances, will involve the neutral in all the embarrassments of becoming a party to the war; for the other side has a right to treat such interferences as acts of hostility, although, if they are of a very limited extent, they are often silently tolerated. Neutral nations are, strictly speaking, bound to compel their subjects to abstain from every interference in the war, as by carrying contraband goods, serving in the hostile army, furnishing supplies, &c. In practice, however, in cases of contraband goods, the belligerents content themselves with exercising the right of confiscation; and the neutral nation submits to this as a just and fit remedy, without any complaint. Subject to the exceptions above referred to, a neutral has a right to insist upon carrying on its ordinary commerce, with each of the belligerents, in the same manner as it had been accustomed to do in times of peace. Whether it may carry on a trade with either belligerent in war, which is interdicted in peace, is a point which has given rise to very sharp controversy in modern times, and especially between Britain and America, the former contending for the restriction to the accustomed trade, the latter insisting upon also carrying on the unaccustomed trade. Whether a neutral nation is bound to allow a passage to the troops of either belligerent through its own territory, is a point often discussed. Strictly speaking, neither party has a right to insist on such a passage; and if it is granted to either, and materially affects the fortune of the war, it is almost always construed as an act of hostility to the other party, and is resented accordingly. A neutral nation has also a right to insist, that no hostilities shall be committed by the belligerents within its territorial limits. The persons and the property of enemies, which are within such limits, are deemed inviolable, and entitled to neutral protection. But the property of an enemy, found on board a neutral ship on the high seas, is deemed good prize, and *e converso* the property of a neutral, found on board of an enemy's ship, is deemed neutral. The reason for the difference is, that upon land the neutral sovereign has exclusive jurisdiction, within his own territory, over all persons and property within it. But all nations have a common jurisdiction on the high seas to enforce their rights, and the right of search carries with it an incidental jurisdiction over all enemy's property found therein, in the ships of a neutral. This right of search, however, is strictly confined to merchant ships, and is never extended to ships of war, belonging to the nation itself; for in such ships the national sovereignty is exclusive. In general, too, the character of neutral, or enemy, is decided by the fact of domicil. A native born subject of one belligerent, who resides in a neutral country, is treated, at least for the purposes of trade, as a neutral; and, on the other hand, a neutral subject, domiciled in an enemy's country, is treated, for the like purposes, as an enemy. In cases of civil war, the rights and duties of neutrals are not essentially different. Every neutral is bound to abstain from all active interference in the contest, on one side or the other. If the contest gives rise to the establishment of independent governments, formed out of the severance of the old empire, it is not deemed an act of hostility to recognise each as having a sovereign existence as a nation. But while the contest is dubious, and the affair wears the appearance of a mere private rebellion, such a recognition would be deemed an active interference to promote the civil war, and therefore would, or at least might, be resented as a departure from the neutral character.

Such is a very general outline of some of the more important principles which are recognised in the law of nations. To go into the details would require an entire treatise upon the law of prize, and another upon many complicated questions, growing out of international rights and duties in times of peace.

NATIVITY, in astrology; the theme or figure of the heavens, and particularly of the twelve houses, at the moment when a person was born; called, also, the *horoscope*. See *Horoscope*, and *Astrology*.

NATOLIA, or ANATOLIA, or ANADOLI; a province of Asiatic Turkey, bounded N. by the Black sea, E. by Armenia and Syria, S. by the Mediterranean, and W. by the Archipelago and the sea of Marmora; about 650 miles long, from E. to W., and 400 broad, from N. to S.; square miles, 270,000; population, 6,000,000. Within these limits are included not only Natolia Proper, but also Caramania, Roum, and Aladulia. The whole is divided, by the Turks, into six pachalics, viz. Natolia, Sivas, Trebisond, Konieh or Cogni, Marasch, and Adana. The capital of Natolia Proper is Kintajah; the principal seaport, Smyrna; the other principal towns are Bursa, Angora, Sinob, Guzel-Hisar Aphiom-Karahisar, and Ismid. It is divided into seventeen *sangiacats*. Natolia was anciently called *Asia Minor*, which comprised ancient Bithynia, Paphlagonia, Galatia, Phrygia, Mysia, Æolia, Ionia, Lydia, Caria, Doris, Pysidia, Licia, and Pamphylia. (*See the articles*.) The soil is in general fertile, producing corn, tobacco, and fruits of various kinds, cotton and silk; and, notwithstanding the indolence of the Turks, the commerce is considerable, particularly in carpets, leather, drugs, cotton, silk, and other articles of manufacture and produce. The greater part of the inhabitants are Mohammedans; but there are many Christians, principally of the Greek church, governed by patriarchs, archbishops, and bishops, who are tolerated by the Porte. There are, likewise, many Armenians, and some Roman Catholics. See *Ottoman Empire*.

NATROLITE. See *Zeolite*.

NATRON; a salt which is found in the ashes of several marine plants; in some lakes, as in the Natron lakes of Egypt; and in some mineral springs, &c. See *Soda*.

NATURAL BRIDGE, in Rockbridge county, Virginia. This bridge, which is over Cedar creek, is a great curiosity. Its dimensions are vast; its appearance lofty, grand, and even awful. It stands on the ascent of a hill, which, according to the opinion of some persons, has been cloven by some great convulsion; but according to the opinion of others the chasm has been worn by the action of the water. The fissure, at the bridge, is 250 feet deep, forty-five wide at the bottom, and ninety at the top. The rock, which forms the bridge, is sixty feet broad in the middle, and is covered with earth and trees. Here is a post-office; fourteen miles S. W. of Lexington, and 180 W. of Richmond.

NATURAL HISTORY is the description of all bodies belonging to nature, in one of the narrow senses of the word *nature*, in which it is confined to the visible objects of this earth, including, of course, the phenomena of their growth and formation. The systems of the different kingdoms of nature will be found under their respective heads; and our limits do not permit us to give here an account of the general systems which have attempted to classify all the phenomena of created objects. Generally speaking, only the external description of the objects of nature is comprised in natural history, and chemistry and natural philosophy are excluded, leaving only four chief divisions: 1. geology, or mineralogy in its most extensive sense; 2. phytology, or botany (the natural history of plants); 3. zoology (description of animals); and, 4. anthropology (the natural history of man). Another division has been made, by German naturalists, with reference to the form of bodies, their composition, and their functions (if they are endowed with life), which gives rise to the three departments of morphology, chemistry, and biology or physiology. Aristotle is to be regarded as the founder of natural history. (See *Aristotle*.) Of the Romans, Pliny the Elder deserves to be particularly mentioned. He left a collection of notices respecting natural history, though deformed by a mass of incorrect observations and fabulous reports. In the darkness which the middle ages spread over the West, the natural sciences suffered severely; nature was dealt with in a most barbarous and absurd manner by the schoolmen. With the revival of learning a new day dawned on natural history; Bacon led the way to closer observation, and much was done, in the last century, by Conrad Gesner in Zurich, Aldrovandi at Bologna, Ray in England, Tournefort in France, and others; but Linnæus first collected and systematized the treasures of natural science. He gave us the first system of nature; and though it is an artificial system, and not founded in nature itself, he has done more for natural history than almost any man for any other branch of knowledge. Since his time, natural history has been cultivated with the greatest zeal in Germany, Britain, France, Sweden, Russia, and of late in the United States. Buffon did much for this science, by the splendid style in which he taught it. The desire to treat natural history according to a natural system, not only in single branches, like botany, but, if possible, in its whole range, became more and more general. Oken has occupied himself with the latter task particularly, and given to the public several results of his labour. The number of works, in the various departments of natural history, is very great. Bohmer's *Bibliotheca Scriptorum Hist. natural.* (Leipsic, 1785 et seq., in 5 parts, 10 vols.), gives those which appeared before the beginning of this century, when a very interesting period commences. A complete view of the present state of this science may be found in Cuvier's *Dictionnaire des Sciences Naturelles*, which has been publishing, since 1816, in Paris, in large 4to. Among the manuals on natural history, Blumenbach's *Naturgeschichte* is one of the most distinguished. Not unworthy to be mentioned here is the *Naturhistorischer Atlas*, by Goldfuss (Düsseldorf, 1824).

NATURALISTS, Association of German Physicians and. Natural philosophy and natural history are studies very extensively cultivated in Germany, by men who devote themselves particularly to the scientific pursuit of these studies, as well as by physicians, &c.; and it was thought that an annual meeting, which might assemble many of the persons thus engaged, would have the most beneficial influence on the progress of science, by the free interchange of their ideas and discoveries, and the mutual stimulus which they would afford each other, besides the benefit which those from a distance would derive from visiting the various museums and libraries. Professor Oken proposed, accordingly, a plan of such a society, which actually went into operation in 1822, and has repeated its annual meetings, each time in a different city, alternately in Southern and Northern Germany, ever since, with the most successful results. The society was established September 18, 1822. Its meetings are always in autumn, and do not last longer than a week. Every author of a work on natural philosophy or medicine is considered a member; inaugural dissertations, however, are not considered as scientific works for this purpose. No election of members takes place. Whoever attends is a member for the time. Meetings are always with open doors, and begin September 18. The members are divided into classes, who meet by themselves, in addition to the general meetings. Each year a president and secretary (the only officers) are chosen for the next year. The association makes no assessment, and holds no property except its records. The expenses of the meeting are defrayed by the members present. Men of science from almost all parts of Europe have attended the last meetings, and, in 1829, when it was at Heidelberg, an invitation was received from the baron De Ferussac, in Paris, requesting this association to coöperate with the society who carry on the Universal Bulletin, in Paris. See a more minute account of this society in No. LXVII. of the North American Review, with a translation of its constitution.

NATURALIZATION. See *Alien*.

NATURAL LAW, or, as it is commonly called, the *law of nature*, is that system of principles, which human reason has discovered to regulate the conduct of man in all his various relations. Doctor Paley defines it to be the science, which teaches men their duty and the reasons of it. In its largest sense, it comprehends natural theology, moral philosophy, and political philosophy; in other words, it comprehends man's duties to God, to himself, to other men, and as a member of political society. The obligatory force of the law of nature upon man is derived from its presumed coincidence with the will of his Creator. God has fashioned man according to his own good pleasure, and has fixed the laws of his being, and determined his powers and faculties. He has the supreme right to prescribe the rules, by which man shall regulate his conduct, and the means, by which he shall obtain happiness and avoid misery. He has given to man the power of discerning between good and evil, and a liberty of choice in the use of those means, which lead to happiness or misery. The whole duty of man therefore consists in two things: first, in making constant efforts to ascertain what is the will of God; and, secondly, in obedience to that will when ascertained. For the purposes of the present article, we shall assume, without undertaking to prove, that there is a God of infinite power, knowledge, wisdom, benevolence, justice, and mercy; that he has created man with suitable powers and faculties to pursue and obtain happiness; that man is a moral, dependent, and accountable being; that his soul is immortal; that his ultimate happiness or misery is dependent upon his own conduct; that there is a future state of retribution, in which the inequalities of the present life will be adjusted according to supreme wisdom and goodness; that, by a right application of his powers and faculties, man may always discern and pursue his duty; that virtue, or doing good to mankind in obedience to the will of God, has attached to it the reward of everlasting happiness; and that vice, or doing wrong in disobedience to that will, is, by the very constitution of man's nature, necessarily connected with suffering and misery, directly or ultimately. In short, that man cannot be permanently happy by the practice of vice, and must be permanently happy by the practice of virtue. We shall assume these propositions, not because they are not susceptible of complete proof, but because, not being intended to be discussed in this place, they nevertheless form the basis of the subsequent remarks.

From the moral government of God, and the moral capacity and accountability of man, we deduce his general rights and duties. 1. His duties towards God. In the just performance of these duties consists piety or devotion. In a large sense, indeed, every performance of our duty is but a performance of some duty towards God; since it is his will which makes it a duty. But in the restrained sense, in which we are accustomed to use the phrase, we refer it to those duties of which God is peculiarly the object. As he is our Creator, we owe him supreme worship and reverence; as he is our Benefactor, we owe him constant gratitude and thankfulness; as he is our Lawgiver and Judge, we owe an unreserved obedience to his commands. We are frail and dependent beings, and we have constant reason to implore his assistance, his mercy and his forgiveness. Hence arises the duty of prayer, as a solemn recognition of our dependence on God; as a means of religious improvement and of cultivating devout affections; as an effectual instrument of communing with our own hearts; as a source of consolation under the afflictions of life; and as an exercise of piety fitted to give a spiritual elevation to our thoughts, and a livelier and more enduring sense of our duty. From the same causes also flow the duty of public and social worship; of maintaining religious institutions; of aiding in the diffusion of religious knowledge; and of keeping in view, in all our words and actions, an habitual and reverential fear of God. —2. The duties of man towards himself, or those which terminate in himself. Among these we may enumerate the duty of personal holiness; of self-preservation; of temperance; of humility; of personal improvement in knowledge, wisdom, and virtue; and of preserving a conscience void of offence towards God and towards man.—3. The duties of man towards other men, or what are called his *relative* duties, arising from the various relations, which he sustains or may sustain towards others.—Now these duties flow from the correspondent rights of others. And this leads us to the consideration of the different sorts of rights. Rights are usually divided into such as are natural or adventitious, alienable or inalienable, perfect or imperfect. We call those rights *natural*, which belong to all mankind, and result from our very nature and condition; such are a man's right to his life, limbs, and liberty, to the produce of his personal labour, at least to the extent of his present wants, and to the use, in common with the rest of mankind, of air, light, water, and the common means of subsistence. *Adventitious* rights are those, which are accidental, or arise from peculiar situations and relations, and presuppose some act of man, from which they spring; such as the rights of a magistrate, of a judge, of electors, of representatives, of legislators, &c. We call those rights *alienable*, which may be transferred, by law, to others, such as the right to property, to debts, houses, lands, and money. We call those rights *unalienable*, which are incapable, by law, of such transfer, such as the right to life, liberty, and the enjoyment of happiness. We call those rights *perfect*, which are determinate, and which may be asserted by force, or in civil society by the operation of law; and *imperfect*, those which are indeterminate and vague, and which may not be asserted by force or by law, but are obligatory only upon the consciences of parties. Thus a man has a perfect right to his life, to his personal liberty, and to his property; and he may by force assert and vindicate those rights against every aggressor. But he has but an imperfect right to gratitude for favours bestowed on others, or to charity, if he is in want, or to the affection of others, even if he is truly deserving of it. It is difficult to make any exact enumeration of what may be deemed the general rights of mankind, which may not admit of some exceptions, or which may not be deemed capable of modification under peculiar circumstances. Thus the most general rights, which belong to all mankind, may be said to be the right to life, to liberty, to property, and to the use of air, light, water, and to the fruits of the earth. And yet, under certain circumstances, life, and liberty, and property, may justly be taken away; as, for instance, in order to prevent crimes, to enforce the rights of other persons, or to secure the safety and happiness of society. And in like manner the free use of air, light, and water, may be interdicted.—In regard to imperfect rights, although the sanction is wholly upon the conscience of the party under a sense of religious responsibility, the obligation to perform the duties corresponding to them is, nevertheless, to be deemed as imperative, as if they also possessed the strongest earthly sanctions; since they arise from the commands of God, and are to be done in obedience to his will. Every man is, therefore, bound to exercise charity in its largest sense; to be just, grateful, kind, and benevolent; to promote the general happiness; to speak the truth, and to abstain from falsehood; to abstain from oppression, anger, revenge, hatred, malice, slander, uncharitableness, persecution, and every other injurious act or passion. These are duties, which are incumbent on him in respect to all the human race. There are others, again, which arise from peculiar relations to others; such are those, which belong to him in the character of master or servant, magistrate or subject, parent or child, husband or wife. Among the duties of masters and servants, we may enumerate, on the part of the master, the duty to enjoin on servants no unnecessary labour or confinement, from caprice, or wantonness, or passion; to insult no servants by harsh, opprobrious, or scornful language; to refuse them no harmless pleasures; to promote their welfare by all reasonable means. On the part of servants, the duty to be industrious, and punctual in the discharge of their duty, faithful and honest; and to yield a ready obedience to all just commands. On the part of magistrates, the duty of exercising power with moderation and mercy as well as justice. On the part of subjects, the duty of obeying the laws and supporting the institutions of society. On the part of parents, the duty of maintaining, educating, and otherwise providing for the intellectual, moral, and physical improvement of their children. On the part of children, the duty to render their parents a just homage, love, and reverence, to obey their commands, to lighten their labours, assuage their sorrows, and, as far as may be in their power, to administer to their infirmities, and to support and succour them when in poverty. On the part of husband and wife, the duty to promote domestic peace and harmony; to cultivate mutual love and forbearance; and in prosperity and in adversity, in sickness and in health, in life and in death, to be true, and watchful, and tender, as those whom God has united in bonds of permanent obligation and sanctity. And this leads us to the consideration of the subject of marriage, and some of the rights and duties flowing from it. Marriage is an institution, which may properly be deemed to arise from the law of nature. It promotes the private comfort of both parties, and especially of the female sex. It tends to the procreation of the greatest number of healthy citizens, and to their proper maintenance and education. It secures the peace of society, by cutting off a great source of contention, by assigning to one man the exclusive right to one woman. It promotes the cause of sound morals, by cultivating domestic affections and virtues. It distributes the whole of society into families, and creates a permanent union of interests, and a mutual guardianship of the same. It binds children together by indissoluble ties, and adds new securities to the good order of society, by connecting the happiness of the whole family with the good behaviour of all. It furnishes additional motives for honesty industry and economy in private life, and for a deeper love of the country of our birth. It has, in short, a deep foundation in all our best interests, feelings, sentiments, and even sensual propensities; and in whatever country it has been introduced, it has always been adhered to with an unfailing and increasing attachment. Polygamy, on the other hand, seems utterly repugnant to the law of nature. It necessarily weakens, and, in most cases, destroys the principal benefits and good influences resulting from marriage. It generates contests and jealousies among wives; divides the affections of parents; introduces and perpetuates a voluptuous caprice. It has a tendency to dissolve the vigour of the intellectual faculties, and to produce languor and indolence. It stimulates the sensual appetites to an undue extent, and thus impairs the strength and healthiness of the physical functions. It debases the female sex. It retards, rather than advances, a healthy and numerous population. It weakens the motives to female chastity, and to exclusive devotion to one husband. Besides; the very equality in point of numbers of the sexes, seems to point out the law of God to be, that one woman shall be assigned to one man. And in point of fact, the countries, where polygamy has been allowed, have been uniformly debased, indolent, and enervate, having neither great physical, nor great intellectual ability. If marriage be an institution derived from the law of nature, then, whatever has a natural tendency to discourage it, or to destroy its value, is by the same law prohibited. Hence we may deduce the criminality of fornication, incest, adultery, seduction, and other lewdness; although there are many independent grounds, on which such criminality may be rested. It follows that the right of divorce must be a very limited right; and that divorces are forbidden by the law of nature, except for causes of a very extraordinary character. It is manifest, that a power on either side to dissolve the marriage at will, would rob the state of matrimony of many of its principal blessings and advantages. It would deprive one of the parents of the comfort and gratitude of the children of the marriage. It would defeat the main purposes of their union, and weaken all domestic ties between parents and children. On the other hand, a very restricted allowance of divorces has a natural tendency to preserve peace and concord in families, by perpetuating a common interest, and encouraging mutual forbearance and affection. By denying, except for extraordinary reasons, the right of divorce, we discourage, in a proportionate degree, the desire, as well as the means of accomplishing it. Christianity has confined the right of divorce to the single case of adultery; though the law of nature may perhaps be thought to justify some few other exceptions.—4. We next come to the duties of man as a member of political society. And, here, we shall briefly treat of certain rights and duties, which may arise from the law of nature independent of any organization into political societies, but which more naturally find a place here, because they constitute the principal grounds for such organization. Thus the right of property, the obligation of contracts, the duty of speaking the truth, the sanctity of oaths, with other corresponding duties, strictly speaking, may be perfect in a mere state of nature, without the recognition of any fixed society; for they may exist and have a necessary application independent of such society. But their value and importance are far more felt, and far better provided for, in political society, and, therefore, properly belong to the present head.

1. The origin of political society.—The origin of political society may be traced back to the primitive establishment of families. From the union of a number of related families grew up tribes; and from tribes gradually grew up colonies and nations. Accidental associations for offence or defence may, in some instances, have introduced the first elements of fixed society between strangers; and a sense of mutual interest and mutual dependence may have rendered them permanent. Coeval with the establishment of civil societies was the origin of civil government. Parents, from necessity as well as from prudence, exercised, and were admitted rightfully to exercise, immediate authority and government over their children and families. The patriarch or chief of a tribe, in like manner, exercised authority over those, who were of his blood and lineage. And, silently, the powers of rule or government were either divided as convenience or accident dictated, or were retained by the head, as the common bond of the union of the whole. Sometimes, indeed, government did or might arise from military associations for plunder or protection. And in such cases the strongest, the most intelligent, and the most enterprising and valiant, were the most likely, in the first instance, to be intrusted with the highest powers. The necessity, in all such cases, of prompt submission and obedience, in order to accomplish the immediate objects in view, furnished a sufficient excuse, if not just reason, for intrusting the leaders with summary and despotic authority.

2. Governments, then, may be properly deemed to arise from voluntary consent, or from long acquiescence and prescription, or from superior force. The fundamental objects of all civil governments are, or ought to be, to promote the welfare and safety of the whole society. It is obvious, that no single individual can protect himself to the same extent, or by the same means, as an organized society or government can protect him. The latter has the powers, authority, union, and resources of numbers. Men enter, then, into civil societies for the protection of their persons, and personal rights and property. In a state of nature, if either be invaded, the only redress is by the application of positive force by the individual who is injured. But under the establishment of civil governments, the redress is taken from the individual, and is administered by the government itself through its own functionaries, and according to its regulations, and by the authority and force of numbers. The entering into civil society, therefore, necessarily, or, at least, naturally, induces the surrender of all those private rights, which are indispensable for the good order, peace, and safety of the whole society. And, indeed, unless some surrender of powers and rights were made, there could be no such thing as a regular government, since each person would be at liberty to do as he pleased, and there could be no such thing as lawful authority on one side to give a rule, or, on the other side, any duty of obedience. Civil government, then, may be properly said to consist in the exercise of such delegated powers, as are proper or necessary for the safety, protection, and happiness of the whole community. And civil liberty may be said to consist in not being restrained by any laws, which are not conducive to the public welfare. We sometimes see governments existing, in which these objects are but imperfectly obtained, and ask ourselves, why they are not changed. There are several reasons, which may help us to a just understanding of the facts, and enable us satisfactorily to solve the inquiry, how it should happen, that governments should fail of attaining the very objects, on which they are founded, and yet be supported by the acquiescence of the people. In the first place, in every government, there are many persons, who obey from mere prejudice, or the habit of obedience, and from an inherent indisposition to contemplate any thing otherwise than as it at present exists. They do not stop to consider, whether it can be made better or not. They are content, from a *vis inertiæ*, to let things remain as they are. In the next place, those whose obedience is governed by reason, are often persuaded to obedience by the consciousness of their own inability to procure suitable changes; by the dread of civil commotions; by doubts as to the method of curing existing evils; and by the persuasion, that in many instances the form of government has become so interwoven with the habits and institutions of the people, that as much mischief as good might be done by a change. In the next place, in every government, many persons have a direct and positive interest in preserving the government as it is, and even in perpetuating its very corruptions. They may be a favoured class, enjoying peculiar privileges, ranks, or patronage; they may have their whole property and importance involved in the existence of the present state of things. In the next place, the actual moral and intellectual power, and even physical power, of the state in its present organization, may be so combined in the structure of the government, that they may present insuperable barriers to any change. If, for instance, the whole of the privileged classes should happen to be the only educated persons in the nation; if the whole priesthood should depend upon the government for its influence and support, and its exclusive patronage and privileges; if the whole wealth of the community should be lodged in few hands, and those few should be the very heads of the government; if the military power should be so organized, that it could scarcely find the means, or possess the power, to act except under the existing arrangements;—in any, and in all of these cases, it is easy to perceive, that there would be immense difficulties in introducing any fundamental and salutary change. It could scarcely take place but upon some general convulsion, which should break asunder all the common ties of society. But it may be asked, as civil government is formed by the whole people, whether it can ever be justly altered, except by the will of the whole. If by the will of the whole be meant the will of each individual singly, it may be answered in

the affirmative; for by entering into society, men necessarily engage to be governed by the will of the majority, since unanimity in all matters of civil polity is impracticable. The will of the majority or the will of the minority must govern. If the latter, by a veto, can stop all measures, the majority are governed by them. All reasoning and all principle, therefore, unavoidably lead to the result, that the will of the majority must be deemed the will of the whole for all practical purposes; and as the interests of the whole society require this, it is binding on every part of it.

3. The origin of property. One of the great objects of political society is the protection of property; and many learned discussions have taken place as to the origin and nature of property. Some things are of common and universal use by all mankind, and to such use all mankind have an equal right. Such, generally speaking, are (as we have seen) air, water, and light. Other things belong, exclusively, to one or more persons, and no others have a right to intermeddle with, possess, or enjoy them. Such an exclusive right in things is called *property*. How did such a right originate? It is plain, that, in a mere state of nature, no man could insist, that he possessed any such exclusive right to things in general; for, if one possessed it, all would equally possess it, which would be the same as to affirm its non-existence. The earth, and its various fruits, herbage, and trees; the various inferior animals, such as birds, fishes, and beasts, either for food, or covering, or pleasure, or labour, seem alike to belong to all mankind, and are for the use of all. To a limited extent, possession and use of a thing must, indeed, confer a temporary or permanent ownership. If, for instance, a man stands or lies on a particular spot of ground, during the time of such occupation, he must have the exclusive right of occupation, for it is indispensable for his immediate use, and no other person can show a better right to it. So if he gathers fruit, for the purpose of eating it, no other person can have a better right to eat it than himself; and he must, therefore, have an exclusive right, because it is necessary to the use. But if he does not hold the fruit to eat it at present, but lays it aside for future consumption, his right to the exclusive use of it is not so clear; it is somewhat more remote; it does not turn upon immediate possession, and immediate use. It may be said, that he has, by his labour, gathered it, and therefore he has a superior title to it. But, though his labour is his own, it does not follow, that, because he bestows it upon another thing, he thereby acquires any exclusive ownership in that thing. It may be extremely inconvenient, and, perhaps, even injurious to the common claims of others, that he should so bestow his labour upon it. They are not, therefore, bound to respect any claim founded upon such labour. Some persons found the right of property upon a presumed or tacit consent of all mankind, which is a mere theory, and wholly unsupported by any universal facts. Others found it upon mere occupancy; but that, at most, gives only a present and temporary right, during such occupancy. Others, again, found it upon the very equality of all mankind, and contend that, as God has given all things for the use and necessities of all, each may appropriate to himself whatever is proper to satisfy those necessities. But, even here, he must leave sufficient to satisfy the necessities of others; and they may take, of the stores so appropriated, enough to supply their own necessities. The truth, however, seems to be, that, in a state of nature, each man actually appropriates to himself whatever he desires, and can get; and he then holds it by the title of the strongest; and no other person respects his title any longer than it can be so maintained, though no one can show a better title to it. As soon as families are formed, the necessity of providing for their own mutual comforts and wants, gradually leads them to hoard up and appropriate food, and other things for future use. The convenience, and, sometimes, the necessity of an interchange of commodities with other families, of which each has a superfluity, leads to an increased accumulation. Possession and power are the guardians of these gathered stores; and a sense of convenience and mutual interest induces every family to regard with respect the commodities in possession of the other. Thus the first rudiments of exclusive property begin in the fact of actual possession and power, and the title gains strength and permanence from a sense of the beneficial results to the interests of all the neighbourhood, and, ultimately, to the whole society, with which each family and tribe are connected. The advantages of the admission of such an exclusive right are soon felt by all reflecting minds, and gradually prepare the way for a more solemn recognition of it. It is perceived, that its tendency is to increase the products of the earth, by creating inducements to plant, when the planter is secured in his exclusive right to the harvest. It also improves the comforts and conveniences of life, and introduces a fit distribution of labour; and it cuts off a great source of perpetual contest and warfare among those, who would, otherwise, be struggling for the common prize. In the ordinary course of things, movables, such as fruits, and flocks, and herds, and fishes, first become property. Land rarely becomes permanent property until a much later period in the history of nations.

4. But, whatever may be the origin of the right to property, it is very certain, that, as it is now recognised and enforced, it is a creature of civil government. Whatever right a man may have to property, it does not follow, that he has a right to transfer that right to another, or to transmit it, at his decease, to his children or heirs. The nature and extent of his ownership; the modes in which he may dispose of it; the course of descent, and distribution of it upon his death; and the remedies for the redress of any violation of it, are, in a great measure, if not altogether, the result of the positive institutions of society. Accordingly, we find that, in different nations, all these subjects are regulated in very different manners. In some nations, all the children inherit the property, upon the death of the ancestor; in others, the eldest son only. In some, there is power to dispose of the whole, or of a part only, by will and testament; in others, this power has been denied. In some, the duration of the right of property is perpetual; in others, it is limited. In some, it may be alienated at all times, and in perpetuity; in others, the power of alienation is restrained. In some, long possession confers title; in others, it confers none. Above all, the capacity to dispose of property is variously regulated by civil institutions. It is obvious, that idiots, and madmen, and infants, ought not to be allowed to dispose of property, since they have no rational discretion. But at what period of life shall a man be deemed to possess such discretion? At ten, or twenty, or thirty years of age? Shall it equally apply, at all times, to both sexes, under all changes of condition? In all nations, some peculiar regulations have been adopted to settle these questions, which, by the law of nature, it would not be easy to settle by any uniform and fixed rule. The power of disposing of property is sometimes allowed at eighteen, sometimes at twenty-one, sometimes at twenty-five, and sometimes at thirty years of age. It is sometimes permitted to married women, but it is more commonly denied to them. Who can say,

which of these periods is the true one, or which of these privileges is the proper one?

5. Another great object of society is the protection, not only of property in *things*, but of property (if we may so say) in *actions*. A great portion of the business of human society is founded upon contracts, express or implied; and these contracts, especially in modern times, constitute the bulk of the fortunes and acquisitions of many persons, from the humblest mechanic up to the most opulent stockholder. The obligation of contracts, or, in other words, the duty of performing them, may, indeed, be deduced from the plainest elements of natural law,—that is, if such contracts are just and moral, and founded upon mutuality of consideration. It is indispensable to the social intercourse of mankind. It is conformable to the will of God, which requires all men to deal with good faith, and truth, and sincerity, in their intercourse with others. It is indispensable, in order to prevent injuries to others, whose acts, and interests, and property, may depend upon a strict fulfilment of such contracts. But, in a state of nature, the obligation of contracts, however perfect in itself, cannot ordinarily be enforced upon the other contracting party to its just extent. The only remedy is positive force; and this, in many cases, is impracticable, and is generally inconvenient. The institution of political society brings the moral, as well as the physical power of the whole in aid of the natural obligation of contracts. The remedy is generally peaceable, perfect, and easy. But it may be naturally asked, what contracts are really obligatory. The true answer, in civil societies, is, all such contracts as the law of the land declares to be obligatory, or of which it permits the obligation to be enforced. The true answer, independent of the positive recognitions of civil society, is, all such contracts as are moral, just, practicable, and have not been extinguished in any lawful manner. Contracts which are immoral, or which have resulted from fraud or oppression; contracts which require impossible things, or are repugnant to natural justice; or which are founded in essential mistakes, as to persons, characters, or things; or which involve the breach of other paramount obligations, cannot, upon the principles of eternal justice, be obligatory.

6. Without going more at large into the origin and objects of political society, it will be seen, that these objects require the delegation (as has been already intimated) of certain powers and authorities to those, who are to administer the government. The ends required are the preservation of the general rights and the general welfare of the community; and the means to accomplish these ends must be given by the express or implied assent of the government. The civil powers, which, in every well constituted society, seem indispensable for this purpose, are the legislative, executive, and judicial powers. In order to secure the safety and happiness of the society, it is indispensable, that there should be somewhere lodged a power to make laws for the punishment of wrongs, and for the protection of rights, and for the promotion of the peace, health, and good order of the society. And, as there is a perpetual change in human affairs, and laws and institutions, which are adapted to one age, are frequently unfit for another, there must exist in the government a power to alter, amend, and modify existing laws;—and, as human legislation must necessarily be imperfect, the power to improve it may always be presumed to be useful, since experience often points out mistakes and deficiencies. The power of legislation must, therefore, in its nature, include the power of abolishing, as well as of enacting laws. Again, as the exigencies of the society must require expenses to be incurred, and revenues to be raised to defray those expenses, the power of taxation naturally belongs to the power of legislation, as a means to accomplish the appropriate ends of society. But, if laws exist, they soon become a dead letter, unless obedience to them can be enforced; for it is found that moral obligation alone is not sufficient to insure a perfect performance of duty. The existence of an executive authority, to which is intrusted the due and vigilant execution of the laws, seems indispensable. And, as controversies may arise, in a great variety of cases, as to what is the right of one party, and the duty of another; whether property belongs to one party, or to another; whether a contract has or has not been performed; whether a wrong has or has not been done; whether a crime has or has not been committed,—it seems also indispensable, that a power should exist, whose jurisdiction should extend over all controversies of this sort, and should finally decide upon them. This power is the judicial power; and its free, independent, and honest exercise is as important to the safety and happiness of society, as either of the other two. In short, without a due administration of civil and criminal justice, society is, and can be, of little value. The merit of every government must, therefore, be subjected to this, as the truest test of its real excellence.

7. In what manner these various powers, legislative, executive, and judicial, are to be exercised, and to what functionaries they are to be intrusted, depends upon the particular organization of each society or nation, or what is usually called its form or constitution of government. Where the society is small, and within a very limited extent of territory, it is possible to have them all exercised in an assembly of the whole people by the whole people. This would be a pure democracy. But it is obvious, that though possible, in an exact sense it is scarcely practicable; for all the people of even a small territory can rarely be assembled; some will be absent from accidental circumstances of illness, and age, and more pressing duties. And, probably, in no society whatever were these powers ever, in fact, exercised by the whole people, in any single assembly; for idiots, madmen, infants, have been universally excluded; and married women, and persons guilty of crimes, have been usually excluded. The most simple form, in which the powers of government have ever been actually administered, probably is by a majority of that part of the people, which has actually been assembled for such a purpose. And this is, in fact, though in its humblest form, a delegation of the sovereign power of the whole, since it intrusts the authority of the whole to the part, which is assembled. It is also, though in its humblest form, a *representative* government; for the whole are represented by those, who are present. We ordinarily call such a government a *democracy*, or government of the whole people. But in societies, which are composed of large masses of population, such a form of government is unwieldy, and burthensome, and inefficient. The people, are, therefore, driven to a delegation of their authority to a smaller number of persons, who can act as their representatives in the discharge of the legislative, executive, and judicial functions. Sometimes all these powers are concentred in a single person; and then the government assumes the form of a pure despotism; sometimes they are all exercised by one and the same select body, composed of a few select persons, and then the government is, in form, a pure aristocracy. Sometimes the powers are divided, and distributed among various functionaries, and then the government becomes a mixed form of government. If the executive power, in such a case, is delegated to a single

person, it is then called a *monarchy*, or a *limited monarchy*. If the executive power is exercised by a select body of men, it is called an *aristocracy* or *limited aristocracy*. If the executive power is exercised by a magistrate elected by the people from time to time, and removable by the people, it is sometimes, though not, perhaps, with perfect accuracy, called a *republic*, or a *limited republic*. If, in a monarchy, the power of legislation is shared by the representatives of the people, it is called a *mixed monarchy;* if in an aristocracy it is so shared, it is called a *mixed aristocracy;* if in a republic, it is called a *representative republic*. But it is obvious that all these forms of government may be variously mixed together by delegations and limitations of the executive, legislative, and judicial powers, in different proportions; and the actual structure of every government depending upon the choice, or necessities, or prejudices, or accidental combinations, of each society, they do not admit of any determinate classifications. But, whatever be the form of the government, the aggregate exercise of the legislative, executive, and judicial powers constitutes what is commonly called the internal sovereignty of a nation.

8. From the nature and objects of civil government, we deduce not only the rights, but the duties of magistracy. These, of course, depend upon the nature of the functions, which belong to the particular department, legislative, executive, or judicial. All magistrates are responsible to God for the due and honest discharge of their duty; and, in republican forms of government, these magistrates are also made, in some shape, directly or indirectly, responsible to the people. Every civil government is bound to promote the interests of agriculture, commerce, and manufactures, as conducive to the strength and happiness of the people. Every government is bound to protect the persons, the personal rights, and property of its citizens from violation and injury. Every government is bound to establish courts of justice, to provide for the punishment of crimes, to enforce the obligation of legal contracts, to encourage marriages, to prohibit immorality, to cultivate a sense of religious obligation, to allow a free exercise of religious worship, and a free expression of religious opinion, so far as it is not inconsistent with the public peace and safety. Every government may impose oaths or other solemn affirmations, appealing to the consciences of parties, for the purpose of ascertaining the truth of facts, or to secure the just performance of duties. It may, therefore, reasonably require, that witnesses should be sworn, or otherwise solemnly bound to testify the truth; and it may also reasonably require parties to take promissory oaths and affirmations for the future discharge of official and other duties. And here ends our imperfect sketch of some of the leading principles of natural law, in their practical application to the relations of man to God, to himself, to other men, and to political society. The consideration of the rights and duties of nations to each other, and of their external sovereignty, and independence, and equality, belongs to another head, that of law of nations. See *Nations, Law of.*

NATURAL PHILOSOPHY. See *Philosophy, Natural.*

NATURAL RELIGION. See *Religion.*

NATURAL STATE OF MAN is frequently used as synonymous with the state of man previous to the growth of civilization, in which he is considered by some as entirely rude, by others as possessing the relics of intelligence, derived from a prior and better state. Some consider him as having begun in a rude state, but as assisted in the first steps of his intellectual progress by inspirations or revelations from Divine Providence, without which, notwithstanding his faculties, fitted for high improvement, he would have been at first more destitute even than the brutes. This view is well represented and defended, among other works, in Richard Whately's Introductory Lectures on Political Economy (London, 1831). The expression *natural state*, if intended to designate the state best fitted to the nature of man, is ill applied to savage life, notwithstanding the poet's dreams of a golden age of innocent ignorance, and the reveries of philosophers like Rousseau upon a state of savage virtue, uncorrupted by the vices of civilization. We believe that man's *natural state* is that of society, in a physical, as well as in a moral, point of view, and that man, in the savage state, is no more in a natural condition than a pine tree which is found growing near the limits of perpetual snow on the Alps, where it is stunted to the height of two or three feet. The characteristic trait of man in his (so called) *natural state*, or, rather, brute state, is improvidence, which reduces him almost to a level with the brutes, and effectually prevents his progress towards civilization; and it is a curious fact, that none of the savage tribes with which modern travellers have made us acquainted, have shown any tendency to intellectual advancement in the course of centuries, unless brought into frequent contact with civilized races—a fact which certainly is a strong argument for those who ascribe the beginning of civilization to the direct interference and assistance of Providence. See *Civilization.*

NATURE; a word of vast and various signification. In its most extensive meaning, it denotes the world, the universe; in short, the creation; hence it comprises both the physical world and the spiritual, as both are created. Those philosophers, ancient and modern, who consider God as inseparably connected with the universe, to which his animating breath gives life, include even him under the idea of nature. In fact, they have not unfrequently confounded God with the laws and principles of nature.* But the Christian expresses, by *nature*, in its most extensive meaning, the *universe*, as contradistinguished to *God*, the Creator. In another application of the word, *nature* is contradistinguished to *art*, and signifies every thing which is not artificial, not purposely produced or practised with reference to rules of art. In this sense, we speak of a *natural* poet, or artist, products of *nature*, &c. It must be observed here, that, in many cases, it is very difficult to draw the exact limit between nature and art. *Natural* is also used in contradistinction to *taught*, or *communicated;* thus we speak of *natural powers*, in contradistinction to the ability acquired by education, and *natural religion*, or that which man is supposed to acquire from observation of himself and the creation around him, in contradistinction to *positive religion*, or such as is revealed, and established by special circumstances. The term *natural religion* has been used, also, in a very different sense. It means, sometimes, that polytheism which is founded on the worship of the deified powers of nature. According to some, all polytheism has such an origin. In the narrowest sense, *nature* means the peculiar character of the various objects of nature in its widest sense, as given above. In this application, it is often used for character only, and we even speak of the "nature of God." In reference to men, *nature* is very frequently used for the physical constitution, and moral disposition, of an individual. In theology, the word *nature* is often used; thus men speak of the "divine and human natures of Christ," of the "natural state of man," &c.

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* *Natura est principium et causa efficiens omnium rerum naturalium, quo sensu a veteribus philosophis cum Deo confundebatur.* Cic. *De Natura Deor., Lib. I. c.* 8, *et sequentib.*, and *Lib. II., c.* 22 and 32. To define *natura* by reference to the *res naturales* can hardly be considered very philosophical.

In the fine arts, *nature* often means the successful imitation of nature; but, with artists of a higher order, *nature* does not signify a mere copy, but, as it were, the expression of the ideal of nature, at which she aims in all her formations, yet without reaching it, as she never produces, in crystallization, precisely that mathematical figure which constitutes her model. (See *Copy*) Though the angles are exact, there is always some side larger than the others.

NATURE, PHILOSOPHY OF. The German *Naturphilosophie* is very different from the English *natural philosophy*. This latter is termed, by the Germans, *Physik*, or *Naturkunde*. The philosophy of nature, in the German sense, is an investigation of its inmost principles, such as the great question of the connexion between matter and mind, either in the case of the individual man, or of the connexion between God and the outward universe, and other questions of this sort, the riddles that have always vexed the human understanding. Natural philosophy (*Physik*) is the great instrument of the philosophy of nature, furnishing it with the materials from which its conclusions must be drawn. Such speculations, even if not likely to lead to any satisfactory results, are yet not to be hastily condemned. One of the strongest proofs of the elevation of which man is capable, is his perpetual striving to rise above the field of ordinary observation, to "pass the flaming bounds of space and time," and, in spite of the weakness of mortality, to explore the abyss of the infinite and the everlasting. If we take the word *nature* in its most comprehensive sense, as embracing the whole of existence, it will include man both as a spiritual and a material being; so that the philosophy of nature, in this sense, will embrace all the departments of philosophy. In its more common sense, however, it has a more limited meaning, and is contradistinguished to *intellectual* philosophy. While this latter strives to investigate the essential principles of religion, morality, law, the philosophy of nature seeks for the ultimate elements of what is generally termed *natural science*. The origin of this philosophy of nature is to be looked for among the Greeks, where Pythagoras presented his views of it in a mathematical form. The term itself is undoubtedly derived from the *Philosophiæ naturalis Principia mathematica* of Newton, although Newton himself advised the students of natural science to avoid this sort of speculation. Schelling must be considered as the reviver of the philosophy of nature in Germany, and has been followed by many others, particularly Oken. Although, as we have said, we do not consider such inquiries as unsuitable exercises of the human mind, we are far from admiring the extravagances to which they have, in many cases, led the German philosophers. Deprived of the subjects which exercise the activity of man in free states, the Germans have pushed their speculations, in many branches of philosophical science, beyond all reasonable limits, and not unfrequently lost themselves in a wilderness of words, reminding us of the remark of Goethe's *Mephistopheles*:

Denn eben wo Begriffe fehlen,
Da stellt ein Wort zur rechten Zeit sich ein.

For when ideas have grown scant,
A ready word supplies the want.

It is but fair, however, to quote, on the other side of the question, a passage of a contemporary writer,* who treats the subject in a peculiar way. Alluding to the views he has before expressed, he says, "With such an idea of this science (philosophy), it is natural that all German speculations should bear more the character of beginnings than of finished results. Important as some of the results are to which these speculative efforts have led, still their greatest value consists in the unwearied and never-satisfied strivings of the mind to sound and comprehend itself, and that whole, of which itself is but a particle. Jacob, who, in his dream, wrestled with the Lord of heaven and earth, bearing off in his lameness a revelation of Omnipotence, is the true emblem of German philosophy. It is something that you must not expect to turn to immediate account in your particular trade or profession; nor is it necessary, in order to be benefited by it, that you should adopt its results. German metaphysics have been called the best gymnastics of the mind: and the true object of gymnastics, we know, is not to give the power to perform some great and astonishing feat, but methodically to unfold, invigorate, and refine all the growing powers of man."

NAUMACHIA (from the Greek *ναυμαχια*, a sea-fight), among the Romans; a public spectacle, representing a naval action. Cæsar was the first who exhibited a spectacle of this sort, which soon became the favourite amusement of the Roman people. The *circus maximus*, in which they were at first represented, being found inconvenient, buildings were erected by the emperors, particularly calculated for the purpose: these edifices were likewise called *naumachiæ*. They resembled the amphitheatres, and, like them, were, at first, built of wood. Domitian appears to have been the first who erected one of stone. A *naumachia*, built by Augustus, was 1800 feet long and 200 wide, and was capable of containing fifty ships with three banks of oars, besides many small vessels. They were suddenly laid under water by means of subterraneous canals, so that the ships were raised at once from the dry floor before the eyes of the spectators. The water was usually brought from the Tiber, near which the *naumachiæ* were usually built, but sometimes from aqueducts. The *naumachiarii*, or persons who fought in these exhibitions, were gladiators, slaves, criminals, &c., who were doomed to die, unless they were saved by the interposition of the people, or of the person presiding at the show.

NAUMANN, JOHN GOTTLIEB, or AMADEUS, one of the greatest composers, chapel-master to the elector of Saxony, at Dresden, was born at Blasewitz, near that city, in 1741. His father was a peasant, who, perceiving his son's talent for music, permitted him to go every day to school, in Dresden. A member of the chapel at Stockholm, having been led, by chance, into the house of his father, was astonished to find some difficult pieces of music lying on the harpsichord, and offered to take the boy, then thirteen years old, to Italy. The offer was accepted with reluctance. The boy was obliged to perform the most menial services for his master. He followed him, on foot, to Hamburg, and thence, in 1758, to Italy, where he was obliged to earn his own subsistence, by copying music, and to cook for his master. He finally obtained admission into the number of Tartini's pupils in Padua, and, soon after, found a kinder master. He remained for three years in Padua, and then went to Naples, where his taste for theatrical music was awakened. He settled in Venice, where he gave lessons, and composed some theatrical pieces. After a residence of eight years in Italy, he was called to Dresden, where he was appointed, in 1765, a composer to the elector. He soon after made a second journey to Italy, residing chiefly at Naples, where he composed two operas. In 1769, he returned to Dresden, in order to compose the great opera *La Clemenza di Tito*, for the marriage of the elector. In 1772, he made a third journey to Italy, where he composed, within thirteen months, five operas, after which the elector appointed him his chapel-master. He composed, for the theatre of Stockholm, his *Amphion*, *Cora*, and *Gustavus Vasa*, and, for the Danish court, his *Orpheus*. Among his best operas are *Tutto per Amore*, and *La Dama Soldato*. In later years, church-music became his favourite occupation, though he brought out his *Acis* and *Galatea*, as late as 1801. He died Oct. 23 of that year, from an apoplectic stroke. He left a number of sacred compositions, as the Lord's Prayer, several psalms, oratorios, vespers, &c. Naumann was also a great performer on the harmonica, for which he composed six sonatas.

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* Professor Follen, in his Inaugural Discourse, Cambridge, May, 1831.

NAUMBURG, on the Saale; an old city, with about 10,000 inhabitants, pleasantly situated near the confluence of the Unstrut with the Saale, in the Prussian duchy of Saxony, government of Merseburg. The cathedral was built in 1028, and deserves to be examined. It was formerly the see of a Catholic bishop; but, on the death of the last bishop, the spiritual jurisdiction was assumed by the elector of Saxony (1564). The wine of the environs is exported. The Schulpforte is in the vicinity.

NAUPACTUS. See *Lepanto*.

NAUPLIA, or **NAUPLION**. See *Napoli di Romania*.

NAVARINO (*Neocastro*); a fortified town, on the south-west coast of the Morea, north of Modon, with a harbour capable of accommodating 1000 ships, but with a narrow entrance, which admits only two ships abreast. The island of Sphacteria (Sphagia) lies before it. The water is deep enough for the largest men-of-war, and affords a perfectly safe anchorage. The fortifications consisted of four bastions and a citadel, on a high rock. The Venetians, who occupied this city a long time, erected the fortifications, and maintained possession of it against the Turks, until 1715. In 1821, it was captured by Tipaldo, a Cephalonian. In 1825, it was taken by Ibrahim Pacha. October 20, 1827, the combined Russian, French, and British fleet, under the command of admiral Codrington (the French admiral was De Rigny; the Russian, Von Heyden), destroyed the Turco-Egyptian fleet of 214 vessels, drawn up in the harbour of Navarino, in less than three hours. (See *Greece, Revolution of.*) In 1829, the powder magazine in the citadel was struck by lightning, and a great part of the French garrison perished in the explosion. Old Navarino, to the north-west of the harbour, is the site of the ancient Pylos, the residence of Nestor. During the Peloponnesian war (425 B. C.), the Athenian fleet destroyed a superior Spartan naval force in this harbour.

NAVARRE (*Navarra*); a province of Spain, with the title of kingdom, separated from France by the Pyrenees, having the kingdom of Arragon on the south. The kingdom was formed on the dissolution of the empire of Charlemagne, and consisted of Upper Navarre to the south, and Lower Navarre, to the north, of the Pyrenees. In 1512, Ferdinand of Arragon united the former to the Spanish crown, and the latter only remained in possession of the kings of Navarre. When Henry IV. (q. v.), son of Antony of Bourbon, and the heiress of Navarre, ascended the throne of France, this kingdom was annexed to the French monarchy, the sovereigns of which assumed the title of "kings of France and Navarre," which (with the exception of Napoleon) they continued to bear until the recent revolution. (See *France.*) Upper Navarre now forms the Spanish kingdom of Navarre, with 271,285 inhabitants, who mostly speak the Basque language; square miles, 2340; chief town, Pampeluna, with 14,000 inhabitants. Lower Navarre, previous to the French revolution of 1789, formed part of the province of Béarn, and, at present, is included in the department of the Lower Pyrenees. The inhabitants also speak the Basque language. See *Basques*.

NAVE (Middle Latin, *navis;* French, *nef*), in Gothic architecture; the part of the cross (in the form of which cathedrals are built) situated towards the west. See *Architecture*.

Nave of a Wheel. See *Hub*.

NAVIGATION; whatever relates to traversing the sea in ships; the art of ascertaining the geographical position of a ship, and directing her course.

Horace has well said, that his heart must needs have been bound with oak and triple brass, who first committed his frail bark to the tempestuous sea. Nothing, indeed, conveys a higher idea of human daring than the boldness with which man rushes forth to encounter the elements: nothing speaks louder in praise of human ingenuity than that wonderful art by which he is enabled to forsake the land, stretching forth until it fades from the horizon, and nothing visible remains but the hollow heavens above, and a trackless waste below; driven from his course by adverse winds, yet, by dint of perseverance, wearying out the elements; and, at length, arriving, with unerring certainty, at the haven where he would be. And if the daring and ingenuity of the navigator deserve our admiration, the result of his efforts will not appear unworthy of the means. It is to the exercise of his wonderful art, that we are indebted for the improvement of our condition, which arises from the exchange of the superfluity of one country for that of another, the whole world being penetrated, and every clime made tributary to every other, until the whole globe is reduced to one common country. Above all, to navigation are we indebted for that higher and nobler advantage,—the interchange of sense and sentiment, which makes wisdom common to the world, and urges man onward to perfection. Yet it has not always been so. Time was when the canoe, or the raft, constituted the only ship of the sailor, and when the narrow precincts of a lake or river set bounds to his roving disposition, and confined him within view of familiar objects. Advancing a step farther, we find him venturing from headland to headland, or from island to island, with a view of gratifying his curiosity, or bettering his condition, until a gale, driving him to some unknown coast, increases at once his knowledge and hardihood. Meantime, his bark adapts itself to nobler functions, enlarges its size, and improves in form: the rudder is added, the mast is better sustained, and the sail receives a more favourable application. And thus the art by which the ship is made, and that by which it is conducted, advance with equal steps. Deprived of the aid of surrounding objects, the land withdrawn from view, and nothing within the verge of the horizon but a waste of trackless water, the mariner casts his eyes in despair to the overhanging heavens. Aid is granted to his prayers: the constellations assist him in his course: among many revolving stars, he finds one steadfast, and makes it his perpetual guide. Such do we find the actual state of navigation among the savage tribes of our own day; and such was also the progress of the art among the earliest nations that improved it. Not the least of the improvements which we have made in this art, is that simplification in practice, by which it is rendered available with little study and capacity.

Anomalous as it may seem, yet it is true, that more study, more experience, and laboriously acquired information, were necessary to form an Acestes, or a Palinurus, than are now required to furnish forth a La Perouse or a Parry. The master or pilot, of ancient times, who had command of the sailors, and directed all the evolutions, was not merely required to know whatever related to the management of the sails, the oars, and the rudder: he was to be familiar with all the ports that lay in the track of his navigation, the landmarks by which they were designated, and all the rocks, quicksands, and dangers of the intervening deep: he was to know the course of the winds, and the indications which preceded them; also the movements of the celestial bodies, not merely for the purpose of directing his course by them, but to understand the winds and weather, which some of them, as Arcturus and the Dog-star, were believed to portend. Moreover, he had to be skilled in reading the various omens, which were gathered from the sighing of the wind in the trees, the murmurs of the waters, and their dash upon the shore; the flight of birds, and the gambols of fishes. A voyage was, in those days, a momentous and awful undertaking. When the time arrived for the sailing of a ship or fleet, the masts were raised, the sails bent, and all made ready with solemnity, and great parade of preparation. If, as was most usual, the ships were hauled up on the shore, the mariners placed their shoulders at the stern of the ships, and, at the word of command, pushed their bows forward into the sea, leaping aboard when they floated. Levers were used to move the heavier vessels, and, in later times, the *helix* (probably jack-screw), which Archimedes had invented for that purpose. Before putting to sea, the gods were ever solemnly invoked, and propitiated by numerous sacrifices; thus we find all Homer's heroes sacrificing to the gods before they undertake a voyage; and Virgil's Anchises ventures forth only after having devoted a bull to Neptune and a bull to Apollo. Nor did the voyagers alone supplicate protection; the crowds of friends and countrymen, who thronged the shore, joined fervently in prayers for their deliverance from danger, and, like the Venusian poet, commended their departing friends to the presiding deities of the winds and waves. All omens were carefully regarded; the entrails of the sacrifices examined, with every possible prognostic of good or evil; and a very small matter, the perching of swallows on the ships, or an accidental sneeze to the left, were enough to delay departure. As this, however, never took place without the most favourable auspices, it was always joyful. The ships were adorned with streamers and garlands of flowers; and, when the signal was given from the admiral ship, by sound of trumpet, a shout of rejoicing rang through the fleet, sent back by the responding blessings of the friends that remained. After advancing a short space, doves, which the mariners had brought from their homes, were released, and their safe arrival—not unfrequently charged with the last adieu of a departing lover—was considered auspicious of the return of the fleet. The admiral led the van, conspicuous by his painted sails and streamers, and opened a path in which many followed. In moderate weather, the ships often sailed side by side; but, as the wind freshened, and the sea grew rough, the order became more open, to avoid contact. At all times, they kept close to the land, following the indentations of the coast. When night approached, it was customary to anchor, or else to beach the vessels, that the crews might repose, each rower sleeping on his bench, ready to renew his labours with the returning sun. If the amenity of the weather, the friendly aid of the moon, or the open nature of the navigation, admitted of sailing during the night, the plummet or the sounding-pole directed their course, or it was shaped, as by day, from headland to headland. If the land were not visible, the known direction of the wind continued, with the aid of the stars, to guide them. Cynosura was the favourite star of the Phœnicians: the Greeks abandoned themselves to the direction of Helice. Having escaped the multiplied dangers of such a navigation, and having accomplished their object, the ships returned home with songs and rejoicings. If they were to be stranded, the sterns were turned towards the shore, and the vessels forced backwards upon it with the oars, until the crew landing, drew them beyond the reach of the surf. Sometimes they were taken into the beautiful moles, or artificial harbours, which the ancients constructed, with great labour and ingenuity, within the natural ones. These were in the shape of crab's claws, or horns, the ends, which formed the entrance, so overlapping as to exclude the swell of the sea. Castles defended their approach, and a light-tower, placed at the entrance, guided those who sailed along the coast, or desired to enter by night. It was called *Pharos*, from the island at the mouth of the Nile, where the first tower had been erected. Here the vessels were not hauled up, but simply fastened to the rings, or pillars, provided for the purpose, while at the inner port were docks and stores for building and repairing. In this port, too, were temples devoted to the gods, and especially to the patron of the place, where propitiatory sacrifices were made, and vows fulfilled or recorded: here, too, were numerous taverns, and places of more licentious gratification. Whether, however, they stranded their vessels on the beach, or moored them in the harbour, the mariners, before repairing to these resorts, fulfilled the vows made before departures, or in seasons of peril, offered thanks to Neptune, and sacrifices to Jupiter, for having granted them release from the durance of their ships. Upon those who had escaped shipwreck, gratitude was more deeply incumbent. In addition to other sacrifices proportioned to their means, they usually offered the garment in which they were saved, together with a picture descriptive of the disaster. If nothing else remained to them, the hair was shorn from the head, and consecrated to the tutelar deity; hence offering the hair was the last vow of the distressed mariner. There is much that is beautiful in these simple acts of piety; but, except in some Catholic countries of the Mediterranean, where pictures of rescue and garments are still hung before the shrine of an invoked intercessor, and where processions are still made, after escape from shipwreck, none of these touching customs now remain. What can be more beautiful than the grateful sense of divine interference with which Columbus and his followers hasten to fulfil their vows after their safe return to Palos? Such piety, if it availed not to avert present danger, at least served to inspire confidence to meet it; and, when past, the gratitude which it occasioned must have tended at once to refine the sentiments and ennoble the heart.

Imperfect as were the means and knowledge of the ancients in this noble art, yet the Carthaginians, who superadded the greatest commercial enterprise to the greatest skill which had yet been attained, achieved results which may even now be esteemed brilliant. They made the whole of the old world tributary to their city: not contented with exploring every nook and corner of the Mediterranean, they left behind the *ne plus ultra* which had hitherto almost entirely bounded the excursions of their predecessors, visited the Atlantic coasts of Europe, the British isles, and, pursuing the grand idea which afterwards led the Portuguese to India, discovered a vast extent of the western coast of Africa. Pliny even states that Hanno completed its circumnavigation, and returned home by the Red sea. Had not Carthage prematurely fallen beneath the rivalry of a nation braver and more barbarous, Vasco da Gama might have had to seek laurels elsewhere than by sailing first to India, and even Columbus been spared the most brilliant and enviable of all the achievements of navigation,—the discovery of the New World. The art of navigation gained nothing after the fall of Carthage; and the invasion of the northern barbarians effectually extinguished the few gleams of science which had survived her catastrophies. Every thing remained stationary for centuries, until the returning day of civilization began once more to dawn upon the world.

It was not until the close of the twelfth century, that man became sensible of the existence of the most singular property which an all-wise and all-beneficent Creator has provided to be his guide upon the deep; nor until a still later period, that the genius to improve it—the gift of the same good Being—at length rendered it available to so noble a purpose. We allude to the polarity of the magnet, and the invention of the mariner's compass. The property of that mysterious mineral to attract iron was early known to the Greeks and Chinese; but the far more singular one of assuming a particular direction, was not even suspected. Pliny himself, who records every thing known or fancied in his time concerning the magnet, makes no allusion to its polarity. The first accounts of this speak of it as known in the twelfth century, and that mariners sometimes made use of it to ascertain their course. Of the mariner's compass, we can only say that it was either invented or revived in 1302, by one Flavio Gioia, an obscure individual in the kingdom of Naples; and even this is not known with certainty. While the heroes of the remotest times come down to us, not only with an accurate account of battles fought and thousands slain, but with a minute detail of their private lives, and most insignificant peculiarities, posterity is at a loss to know whom to bless for a recent discovery, of all others the most useful in its results, the most important in its influence upon the destinies of man. The effects of this discovery upon navigation were not, however, immediate; for the mariner, as much as any one the slave of habit, could not at once appreciate and confide in the excellence of his new guide. This is the only excuse for the uncertainty which hangs about the identity of the discoverer. The experience of half a century, however, showed the value of this new assistant. Navigation now assumed a bolder character. Prince Henry of Portugal, son of king John, having gained a brilliant reputation in a war with the Moors, turned from these fierce pursuits to the more congenial one of science. Retiring from court, he established himself in a retreat upon the promontory of St Vincent, and, calling round him astronomers and mathematicians from every nation, he collected and systematized all the science of the day. Nor were his researches of a mere speculative character; they were directed to enlighten the field of discovery in which he was engaged, in search of a nearer route to India, and which, though he attained not the grand object of his ambition, repaid him well by the inferior discoveries to which it led. It was to aid these enterprises that he caused charts to be drawn, which, though they involved the monstrous supposition of the earth's being an extended plane, were of no inconsiderable use to the navigator, as they brought together whatever was known of the relative position of the different points of the earth, and enabled him to see, at a single glance, as in a picture, not only the direction of the port which he desired to visit, but also the various coasts, rocks, and quicksands, to be avoided in the way. He also invented the astrolabe, which was simply a quadrantal arch, graduated at the rim into degrees and half degrees, and by directing one edge of which towards the heavenly body whose altitude it was desired to measure, a plummet suspended from the centre was made to mark the angle of elevation. This was used at first to discover the latitude from the elevation of the pole star; for, as that star is in the horizon when viewed from the equator, and rises gradually in approaching the pole, so that it would at length become vertical, it follows, that the elevation is always equal to the observer's distance from the equator, which is the latitude. The error resulting from the star's not being exactly polar, was of little note in those primitive days of the art. Soon after, by causing tables of the sun's declination to be computed, prince Henry enabled the mariner to deduce his latitude more correctly from the meridian altitude of that star. Yet all these improvements, though they added much to what was already known, left the art in its infancy. Columbus was the most accurate navigator of his day; still we find him often making an error of so many degrees in his latitude, that the mistake of an equal number of minutes would not be excused in a modern navigator. To mention one of many instances,—he places San Salvador three degrees north of its true position. But if Columbus made his discovery with such imperfect means, the greater was his merit: to him belongs the credit, by pushing boldly forth amid the uncertainties of the ocean, of forcing navigation, as well as shipbuilding, to provide against new difficulties, and march rapidly onwards in the career of improvement.

From the moment that the hitherto hidden mysteries of the ocean were thus solved, we find improvements and inventions multiplying in rapid succession: First, the log is introduced, to measure the ship's rate of sailing: Nunes, a Portuguese mathematician, next shows that the shortest distance from place to place upon the surface of the globe, must always be along a great circle of the sphere: he also proves the fallacy of the plane chart; Gerard Mercator, a Fleming, next suggests the idea of extending the meridian lines on the plane chart, in receding from the equator, in a ratio equal to the error occasioned by supposing the meridian's parallel, instead of gradually converging as they do towards the poles. By this means, the advantage of a plane surface was retained, without the error of the old chart, or the inconvenience and imperfection of the globular projection. Wright, an Englishman, improving the suggestion of Mercator, calculates a table of meridional parts, increasing the length of the arches of meridians in due proportion towards the pole, and furnishes, thereby, data to determine, in any latitude, the difference of longitude from the departure, or distance sailed east or west. At the same time, Napier's invention of logarithms wonderfully diminishes the labour of calculation, enabling the mathematician, by their help, to substitute for the tedious operations of multiplication and division, the simpler ones of addition and subtraction. Now, too, Gunter presents the seaman with his admirable scale, containing the logarithmic lines, by aid of which and a pair of dividers, all the problems of geometry are easily and accurately performed. The circumference of the earth is ascertained by measuring a given portion of its arch; and the length of a degree being known, the log-line is marked accordingly. The quadrant, or rather octant, is invented, and measures the altitude of the heavenly bodies to the nearest minute, undisturbed, like the astrolabe, by the motion of the ship. The sextant and circle still improve upon the octant and each other. And now the tables of the moon's motions, invented by Mayer, with a view to ascertain the longitude, are improved by Maskelyne, and published periodically at the expense of the British government. The idea of finding the longitude by the watch had been early suggested as an important use of that admirable machine; but it continued too imperfect until the last century, when the munificent rewards offered by Britain so stimulated mechanical ingenuity, that it has at last become admirably adapted to this important purpose.

To those who are ignorant of the means by which men are enabled to trace their way over a trackless deep, and to whom the whole art is a mystery, it may be interesting to learn how seamen, and often very ignorant ones, are able successfully to practise it. We shall, therefore, in conclusion, briefly explain the actual practice of navigation: and, first, it may be necessary to premise that, in order to determine and designate positions on the surface of the globe, latitude and longitude have been invented. Nor is this system entirely arbitrary, since nature herself furnishes the data. We have the poles, determined points of that axis round which the earth performs its daily revolutions; equidistant from these poles, and midway between them, nature aids us to conceive a line called the *equator*, and about which, by the motion of the earth in its orbit, the sun seems to perform an equal movement, accomplishing the beautiful scheme of the seasons by an annual excursion on either side. What idea more obvious, and, at the same time, more beautiful and complete, than that of measuring latitude from the equator towards the poles, upon meridional lines perpendicular to it, and formed upon the surface of the earth by planes of its axis? But the latitude, though it indicates the distance from the equator, does not alone determine the position; for the same latitude may correspond to an infinity of places, except only a latitude of ninety degrees: hence, then, the necessity of longitude, measured round the world upon the equator, and small circles parallel to it; for, crossing each other at right angles, the same latitude and longitude can only concur at one given point. Latitude and longitude are measured in degrees, minutes, and seconds; the first, from the equator to the poles, a quadrant of ninety degrees; the second, from the first meridian east and west, a semicircle, or 180 degrees, and meeting at the antipodes In this there are two things deeply to be regretted: one is, that the circle had not been divided into 400 degrees, instead of 360, each quadrant being of 100 degrees, and each degree further subdivided centesimally into minutes and seconds. Every one having any knowledge of figures may appreciate the advantage. The second subject of regret is, that, nature having furnished no data for a line at which to begin the measurement of longitude, the first meridian is arbitrarily chosen, almost every nation selecting its own capital for the purpose: hence charts and nautical almanacs must undergo a tedious reduction before they can be used by mariners of different nations. The cause of science, as well as general convenience, would be greatly promoted by adopting some ocean island as a common first meridian, whence the longitude might be universally estimated, without shocking national vanity.

Let us now show the means by which the mariner guides his bark across the ocean, and is able, at all times, to determine his progress and position. The most important instrument used by the navigator is the compass. It consists of a magnetized needle, freely suspended, by an agate or metal socket at its centre, upon an upright spindle, and possessing the singular property of pointing to the poles. The magnetic virtue is communicated to the needle, which is a flat, oblong, piece of hard steel, by applying a natural or artificial magnet to its two extremities. The magnet has two distinct properties, corresponding to its two extremities or poles, the one called *boreal*, the other *austral* magnetism, and which have a near analogy to the equally mysterious principles of positive and negative electricity. When, then, the poles of the magnet are applied respectively to the intended poles of the needle, magnetic influence is developed, not imparted; for the magnet, instead of losing virtue, has itself gained a new accession; and the needle assumes the wonderful power of pointing to the poles of the earth. Attached to the needle is a circle of paper, called the *card*, upon which the points of the compass are marked, the north and south points corresponding to the poles of the magnet, with which it revolves. The spindle rises from the bottom of a brass or wooden hemisphere, called the *shell*: this shell is connected to the compass-box by means of two concentric rings, or jimbals, which allow it to swing freely as the ship rolls and pitches, so as to maintain a perpetual level. The box, in turn, is placed within the binnacle, which stands in front of the helm. It were vain here, or any where, to speculate upon the cause of magnetism. We are acquainted indeed, with the effects of the phenomenon, but all beyond continues to baffle the search of science. It only becomes us to avail ourselves of its guidance, with humble and devout thankfulness for a gift obviously bestowed to open to us the highways of the deep.

Having in the compass an instrument for directing our course, we next seek the means of ascertaining the distance run. This we find in the log. The log is a long cord, having a piece of wood attached to one end, and called the *chip*. This is of a quadrantal form, and being slung at the corners with line, and loaded at the circumference, when thrown overboard, it remains erect and stationary, and drags the line off as fast as the ship passes through the water. The line is divided into knots and half knots, representing miles and half miles, or minutes of a degree, to which they bear the same proportion as the log-glass does to an hour. Thus the log-glass being filled with sand, to run through in thirty seconds, the length of a knot must be fifty-one feet, the first being the same proportion of an hour that the last is of a mile. As, however, the log is found to come home a little in the effort to draw the line out, it is customary to mark the knot a foot or two less than the true length. The mode of heaving the log to measure a ship's rate, is as follows:—The log-reel, upon which the line is wound, being held by one of the sailors, the officer places himself on the rail to leeward, and a third person holding the glass, he proceeds to prepare the chip, so that the peg of one of the lines holding the chip in a perpendicular direction, will draw out, by the force of the water, when the reel is stopped, and allow it to haul in easily. Then, having gathered a sufficient quantity of line into his hand, he throws it far to leeward, that it may not be affected by the eddies which follow in the wake. The stray line, which allows the chip to get astern, now runs off, and the instant that the white rag, which marks its termination, passes through the hand of the officer he cries, "Turn!" and continues to veer out line until the glass runs out, and the person holding it cries, "Stop!" Then the line is grasped, and the number of knots that have passed off mark the speed of the ship. When this exceeds five miles, it is usual to use a glass of fifteen instead of thirty seconds, counting the knots double. The rate of sailing, per hour, multiplied by the hours sailed, thus gives the mariner the measure of his run.

In addition to these essential instruments for directing the course and ascertaining the distance, the navigator must be provided with octants of double reflection, to measure the altitude of the heavenly bodies; and a circle, or sextant, more nicely graduated, to measure distances between the moon and stars. He should also have with him a book containing the logarithms of numbers, sines, tangents, and secants, to facilitate trigonometrical calculations; tables for correcting altitudes for dip, parallax, and refraction; also lists of latitudes and longitudes for every part of the world; and of time of high water at every port, at the period of full and change of the moon, from which, at all times, to be able to find the tide; and a variety of tables, to facilitate the various problems of navigation. He should also have with him the Nautical Almanac, containing the places and declinations of the fixed stars and planets, and especially the distances of the moon from the sun and other stars, and all that relates to that body, with a view to calculate the longitude by observation. Finally, he must be provided with the general and local charts applicable to his contemplated voyage. Thus furnished, the mariner may set sail with confidence; many do so with no other aids than their compass, log, quadrant, a single chart and book of navigation, and arrive in safety.

But it is less our business to show with how little care a ship may be navigated, than to show how she may be carried from port to port with the greatest possible certainty. Having taken leave of the port, and, when the last land is about to disappear from view, either from the growing distance or the intervention of night, the mariner selects some conspicuous headland, of which the latitude and longitude are noted in his tables, and, placing a compass in some elevated position, remote from any iron object to disturb its polarity, proceeds to determine its bearing, and estimate his distance from it, either by the progress made from it, or by the ready estimate of a practised eye. Or, taking the simultaneous bearings of two distinct points of coast, he has still surer data for deducting his position. This is called *taking the departure*, and is carefully noted on the log-slate, with the time of making the observation. Thenceforth the log is thrown every hour, and the course and distance are entered upon the slate, to be copied into the log-book at the end of the day. The first thing which the navigator attends to, after making the offing which prudence dictates to clear the dangers of the land, is to shape his course for the port of his destination. And first he searches in the chart if there be any point of land, island, or rock, intervening in his way. If there be, the course is primarily shaped with reference to the danger; if not, the differences of latitude and longitude between the two places being taken, the course and distance are obtained by the aid of trigonometry. The shortest distance between any two places on the surface of our sphere, is the arc of a great circle passing through those two places. Thus, between cape Henry, in latitude 37°, and the island of St Mary, in the same latitude, but 50° lon. farther E., the distance is thirty miles less in sailing on a great circle, than if you were to sail due E. on a parallel of latitude, and consequently on a lesser circle of the sphere. In a higher latitude, the difference between sailing on a great or small circle becomes more considerable, as the small circles grow smaller; thus, in the latitude of 60°, a distance equal to that between cape Henry and St Mary would offer a disparity of nearly 200 miles. But, as it is only in sailing on the equator, or on a meridian, that the compass points us uniformly along a great circle of the sphere, in most cases it would be necessary to change the course at short intervals, in order to attain even an approximation towards this desideratum. For instance, in sailing from cape Henry to St Mary, on a great circle, it would first be necessary to sail more than a point northward of E., gradually approaching that direction towards the middle of the distance, when the course should be due E.; thence declining southward, until the land would be made upon a course as much south of E. as, on starting, it was north of it. In high latitudes, when the reduction of distance would offer a sufficient inducement, it may be advantageous to attempt following a great circle; but in the seas ordinarily traversed by mariners, the trifling increase of distance which results from following a uniform course, as obtained by Mercator's sailing, is far more than compensated by its convenience and freedom from all perplexity. For the rest, the wind not unfrequently deprives the fastidious navigator of all choice between a great circle and a loxodromic. At the first noon succeeding the time of taking his departure, the mariner works up his reckoning. This is an epoch fixed by nature, being determined by the passage of the sun over the meridian, and is therefore well chosen as the beginning of the day. The log-slate being marked, he copies the courses and distances, if from head winds or other cause they have been various; the departure from the land is also converted into a course; as is also the current, if there be any known one. He next proceeds to find the difference of latitude and departure from the meridian corresponding to each course, either by geometrical calculation, or, more expeditiously, by reference to tables, then he adds the several differences of latitude and departure, and, if they be of different names, as some north and some south, some east and others west, deducts the less from the greater. With the remaining difference of latitude and departure, he not only finds the course and distance made good, but also the latitude and longitude in; the difference of latitude being applied to the latitude left, by adding or subtracting, in sailing from or towards the equator, at once gives the latitude of the ship. But before the departure can be thus applied to find the longitude, it is necessary to reduce it for the converging of the meridians towards the poles; for, though all degrees of longitude are divided, like those of latitude, into sixty minutes or miles, yet they decrease in length, from being equal to a degree of latitude at the equator, until they become nothing at the poles. There are many ways, more or less accurate, of deducing the difference of longitude from the departure, the latitude being known; they are founded upon this principle: the circumference of the earth at the equator is to its circumference at any given parallel of latitude, as the departure is to the difference of longitude. The most easy and correct way of obtaining the difference of longitude, on an oblique course, is by the aid of a table of meridional parts; for, having taken out the meridional difference of latitude, the mariner has this simple proportion: the proper difference of latitude is to the meridional difference of latitude, as the departure to the difference of longitude. The difference of longitude thus obtained, is applied to the longitude left, adding or subtracting, in sailing to or from the first meridian, and the result will be the ship's longitude; which, with the latitude previously ascertained, determines her position on the chart. The method of navigating thus described is called *dead reckoning*. It is far from infallible, and leaves much to desire. It will, indeed, do pretty well in short runs; but as errors daily creep is from many causes escaping calculation, such as bad steerage, leeway, heave of the sea, unknown currents, and as these accumulate, and become considerable at the end of a long voyage, it becomes necessary for the mariner, removed from all reference to terrestrial objects, to resort to the immovable guides in the heavens, whose motions the God that placed them there has given him capacity to comprehend.

Let us now see how the ship's position on the ocean, represented by latitude and longitude, may at any time, without reference to course sailed, or distance, to capricious winds and stealthy currents, be ascertained with ease and accuracy. And, in the first place, to find the latitude, we have abundant data. All the heavenly bodies are, by the revolution of the earth, daily brought to the meridian, at which time, if their altitude be measured, their declination or distance from the equinox being known, the latitude is readily deduced; it may also be deduced from single or double altitudes of bodies not in the meridian, the times being accurately known. But the meridian altitude of the sun is what furnishes at once the easiest and most correct method of finding the latitude. The meridian altitudes of the stars, and frequently of the moon, must be taken at night, when the horizon is vaguely marked; moreover, their minuteness and want of brilliancy make observation troublesome and uncertain; but when the sun comes to the meridian, the observer brings a brilliant and palpable object down to a well-defined horizon; then, too, he has the advantage of observing, at a self-fixed epoch, the beginning of a new day. So great, indeed, are the advantages offered by the meridian altitude of the sun, that no other means of finding the latitude are used, except when these have failed from a clouded atmosphere, or when the momentary expectation of making the land quickens the mariner's anxiety. We shall, therefore, now explain the method of deducing the latitude from the sun's meridian altitude. Furnished with a sextant, circle, or octant of reflection, the observer goes upon deck, and, having examined the adjustment of his instrument, proceeds to bring down the image of the sun reflected by its mirror, until the lower limb just sweeps the horizon. He continues to follow and measure its ascent, until it ceases to rise; the moment that it begins to fall, and the lower limb dips in the horizon, the sun has passed the meridian. The altitude marked by the index being read off, it is next corrected. And first, the observer adds the semidiameter, in order to make the altitude apply to the centre of the object; next, he subtracts the dip, to meet the error caused by the extension of the horizon, in consequence of the rotundity of the earth, and the elevation of his eye above its surface; also the refraction of the atmosphere, by which the object, when not vertical, is made to appear higher than its true place; lastly, he adds the parallax (a small correction, inconsiderable from the sun's distance), in order to reduce the calculation for the centre of the earth; for which point all calculations are made, and which is ever supposed to be the station of an observer. Having made all these corrections, which many mariners despatch summarily, by an addition of twelve minutes, he has the true meridian altitude of the sun. Taking this from a quadrant, or ninety degrees, gives its zenith distance, or distance from that point in the heavens which is immediately over the observer, and would be met by a straight line passing from the centre of the earth through his position. Now, if the sun were for ever on the equinoctial, the zenith distance would always be the latitude; for, whilst the zenith is the observer's position, referred to the heavens, the equator is there, in like manner, represented by the equinoctial; and we have already seen that latitude is the distance from the equator. But, as the sun is only twice a year upon the equinoctial, and as his distance from it, at times, increases to more than 20°, it becomes necessary to take this distance (called his *declination*) into the estimate. The sun's declination is given, in the Almanac, for the noon of each day; by correcting it for the time anticipated or elapsed, according as the sun comes first to him or to the first meridian, by his position east or west of it, the observer obtains the declination for noon at his own position. This declination applied to the zenith distance, by adding when the sun is on the same side of the equator, by subtracting when on the opposite side, gives the true latitude. A daily and accurate knowledge of his latitude is, then, to the mariner of our day, a desideratum of easy attainment. By its aid, nothing is easier than to sail clear of any rock or shoal that crosses his track, either by a watchful look-out at the moment of passing its latitude, or else by avoiding its parallel entirely, until it be surely passed. Moreover, this is his best and surest guide in aiming at his destined port; for he has but to attain the exact latitude it lies in, and then sail directly upon it, east or west, to be sure of success. And here nature is again his friend: by a singular coincidence, discoverable in glancing at the map of the world, most coasts and continents lie in a northern and southern direction. Hence the value attached, by seamen, to an accurate knowledge of the latitude; and hence the saw of "Latitude, lead, and look-out." But if it be possible to obtain the longitude with any thing like an equal ease and certainty, no one will dispute its advantage. Although, as we have stated, most coasts follow a northern and southern direction, there are yet not a few, such as both coasts of Cuba and San Domingo, which lie east and west, so that points along them are only determined by the longitude. And even to have the satisfaction, not merely to run his finger along the chart, and say, "I am somewhere along that parallel," but to be able to point to the spot, and say, "I am there," is, to the nice navigator, no insufficient motive.

Various ways have been devised to find the longitude, in all of which the great element is time. Inasmuch as the earth performs her diurnal revolution in twenty-four hours, from the time any given meridian is brought under the sun until it reaches it again, it follows that twenty-four hours and 360 degrees are both equal to a circle, and that the equator and other circles of longitude may be indifferently estimated by either of these divisions. Hence the difference of time between two places, is no other than the difference between the sun's coming to their respective meridians, or, in a word, their difference of longitude; and hence it follows that if we, by any means, simultaneously ascertain the time at the first meridian, and the time at ship, we shall have ascertained the longitude. The easiest method of solving this problem is by means of the chronometer. This is a watch so nicely constructed as to go with perfect uniformity, either having no error whatever, or else losing or gaining a known quantity every day. This watch is set to the time of the first meridian, and its rate is carefully ascertained, before leaving the land. To find the longitude by means of it, the mariner has merely to take an observation of the sun or other star, when rising or falling rapidly, and deduce the time of ship; this, compared with the time at the first meridian, simultaneously given by the chronometer, determines the longitude. Several chronometers concurring with each other, may make the mariner sure of his position; but a single one, unchecked by other data, and liable, from its nicety of construction, to easy derangement, is a dangerous guide. The many noble ships so inexcusably lost, in late years, between the entrances of the Delaware and Hudson, owe their destruction to a blind dependence on a single chronometer. The most expeditious and certain way of observing the longitude, is by the eclipses of Jupiter's satellites. Their times of immersion and emersion at the first meridian are noted in the Almanac, and these, compared with the times at which the telescope shows the observer the occurrence of the same phenomena, determine the longitude. But the unsteadiness of a ship at sea deprives the mariner of this expeditious method. Fortunately, there yet remains open to him one of sufficient accuracy: this is, by observing the distance of the moon from the sun and other fixed stars, and comparing the time of observation with that time at which the Almanac shows a similar distance for the first meridian. The only difficulty attending this beautiful method, which the rapid movement of the moon in her orbit, and her consequent change of distance from the stars, renders proportionably correct, consists, in the first place, in nicely observing the distance, and then in correcting it trigonometrically for the errors occasioned by parallax and refraction. A single lunar observation, like a single chronometer, has been confided in to the loss of many a gallant ship; but a series of them, taken from day to day, with stars on different sides of the moon, and concurring to show the same longitude, are worthy of all confidence. Thus, aided by these heavenly guides, is the mariner at all times able to determine his position. He should not, however, be inattentive to any means of information; he should, by observing the difference between the magnetic bearing of some heavenly body, and what calculation shows to be its true bearing, daily inform himself of that wonderful phenomenon,—the magnetic variation; he should, in calm weather, ascertain the direction and force of the current, by lowering a boat, and anchoring it to an iron vessel let down below the superficial strata of the ocean; in approaching the land, he should be attentive to the changing colour and temperature of the sea, which last is, especially on some coasts, an admirable monitor; also to the floating of weeds, and the flight of birds, such as do not stray far from it. All these little cares, the watching of the barometer, and profiting by its friendly predictions, and the frequent inspection of the chart, whilst they take from the dangers of navigation, amuse the mariner, and beguile the tedium of the sea. Thus, then, is a ship conducted from port to port; thus are dangers avoided, difficulties overcome. Though they who traverse the vast ocean leave neither track nor waymark for the guidance of those who follow, it is thus converted into a plain and convenient highway, extending to the extremities of the earth. See the article *Ship*.

NAVIGATION LAWS. The acts of the British parliament, intended to favour British shipping in preference to that of other countries, are denominated *navigation acts*. It is the policy of every nation having any considerable advantages for maritime commerce, to encourage and protect their own shipping, by giving it advantages in the home ports. One mode of doing this is by absolute prohibitions in certain species of trade; another is, by taxing foreign shipping, or the cargoes imported or exported in foreign bottoms, at a higher rate than the national vessels or their cargoes. The most celebrated law of this description is that passed by the British parliament in Cromwell's time, in 1651. Its object was to wrest the carrying-trade of Europe from the Dutch, into whose hands it had, at that time, mostly fallen. For this purpose all foreign vessels were prohibited from engaging in the trade between one British port and another, or between any British port and a colony or dependency of Great Britain. This trade is equivalent to the coasting-trade of the United States of America, and such other countries as have no foreign dependencies. The trade between the ports subject to any government, whether at home or abroad, is a proper object of legislative regulation, and the reasons for confining it generally to the national shipping are obvious; since, if a country depends upon foreign vessels to carry on the trade between its different ports, the means of communication are liable to be withdrawn in case of a war with the nation whose shipping is employed in such trade. Another reason in favour of such a law is founded in the policy of most countries to open to their own citizens the means of employment, as far as their habits, disposition, and capabilities dispose them to fill up such employments. There are other reasons for such a regulation, which need not to be stated here, but which, with those above stated, have induced maritime countries to pursue a similar policy. The other material provision of the law of Cromwell's parliament, was a requisition that foreign ships should bring to England only the products of the countries to which the ships belonged. This at once cut off the Dutch from all their foreign carrying-trade, as far as Great Britain and its dependencies were concerned. The operation of such a law would, of course, be limited by the amount of commerce of the country by which it should be adopted. But the commerce of England being extensive, it would necessarily have a powerful influence in increasing the maritime industry and capital of the country. If every nation with which Britain had any commerce, had had a commercial marine, and had passed a similar law, still the British shipping would have stood upon an equal footing with that of each foreign country in carrying on the trade between the two, and the Dutch, the great rival against whom the law was levelled, would have been confined to the trade between Holland and Great Britain. But as all foreign nations had not such a marine, and as all those which had did not immediately pass similar laws, the British navigation not only regained from the Dutch the transportation between British and other foreign ports than those of Holland, but also acquired a very large portion of the foreign carrying-trade between one foreign port and another; of a large proportion of which they have kept possession now for more than 170 years. Such are the general features of the navigation acts of Great Britain; but they allowed of some exceptions, as where it was supposed to be for the advantage of Great Britain to supply foreign countries with any particular product of England or its colonies, and such a supply would be promoted by relaxing the navigation laws, as was the case, for a time, in respect to some West India products, the vessels of other countries were permitted to trade to the colonies, and take away cargoes of such products for any foreign port. This was a relaxation of the colonial system, which is closely interwoven with the navigation laws. It was adopting, so far, the principle of free trade. But this principle does not, by any means, form the basis of the present system of the navigation laws of Great Britain, nor, indeed, of any other country having a commercial marine of any considerable extent. In the trade between any two countries, one cannot obtain any advantage by legislation, except by the supineness or mistakes of the other; for whatever regulation is adopted by one, may be countervailed by a corresponding regulation of the other. In case of a reasonable share of intelligence on the part of both, each must be content with a reciprocity; and in this nations are, at present, willing to acquiesce. Another object of the navigation laws is to promote the fisheries, as a source of wealth, and also a nursery of seamen. The laws of England, Holland, France, and the United states of America favour this branch of maritime industry by strenuous encouragement and protection.

NAVIGATOR'S ISLANDS; a group of about ten islands, in the southern Pacific ocean, to the north-east of the Friendly islands; between lat. 13° and 15° S., and lon. 168° and 173° W. Like most other islands of those seas, they are surrounded with coral reefs, and appear to be of volcanic origin. The natives are numerous, strong, well made, fierce, and active. The islands abound in cocoa, bread-fruit, bananas, and domestic animals of several sorts. They were discovered by Bougainville in 1768.

NAVY, in the usual sense of the word, the whole body of the ships of war belonging to a nation or monarch. In no state of society, however primitive, has man long learned to navigate the rivers and seas that surround him, before his evil passions have involved him in contention and war. It is not enough that murder should stalk the earth, and make its fields drink the blood of him to whom it was given as a heritage; the ocean, already terrible in its own horrors, is also too often crimsoned with the same carnage.

It may, perhaps, be questioned whether maritime pursuits be not more likely to produce discord than those of the land. The shepherd subsists upon his flock; it furnishes him at once with food and raiment; the cultivator lives upon the produce of his field; but the moment that the merchant goes forth to exchange his superfluity for the superfluity of others, there arises a collision of interests; that spirit of cupidity which has, in all ages, characterized commercial nations, is aroused; avarice, hatred, and revenge excite to discord, and the seeds of war are already sown. Thus we are told that the Phœnicians, in their solicitude to retain the vast monopoly of trade, for which they were indebted to their enterprise and industry, not only concealed studiously the courses of navigation by which they arrived at the remote countries with which they traded, but, if followed by strange vessels, would seek to mislead them, conduct them into dangerous situations, and even risk the loss of their own vessels to effect that of their pursuers. To complete the discouragement of their commercial rivals, they plundered and destroyed every foreign vessel and crew that they met with—a system which doubly favoured their desire of gain. Such is the origin of maritime war and naval armies.

The earliest instance of naval warfare recorded in history, is that of one Erythras, a prince who made himself master of the Red sea, and monopolized its commerce, to the exclusion of the Egyptians, who were only allowed to navigate it with a single ship. The Egyptians, thus restricted, are said to have partially evaded the edict by making their single ship of an unusual size; much as the British did, in past centuries, with their single annual ship to Puerto Bello. Erythras is not, however, allowed the undisputed honour of originating naval war. He has a formidable competitor in Jason, and two still more so in Neptune and Hercules. Without attempting to settle the respective claims of these nautical worthies, we will content ourselves with endeavouring to discover the nature of naval war in the earliest ages of history.

The most noted battle of ancient times is that which took place between the Greeks and Persians at Salamis, five centuries before the Christian era. The situation of the Grecians struggling to preserve their liberty from the threatened yoke of Xerxes; the generous rivalry of Aristides and Themistocles; the heroism of Artemisia, with many romantic incidents, combine to shed a strong interest over this famous engagement. The Grecian fleet consisted of three hundred and eighty ships, all, doubtless, very small, as we are told that the largest galley was of but fifty oars, with only eighteen fighting men. The vessels were without decks, and the contest was decided either by running each other down, or else by grappling and fighting hand to hand, the victory declaring for those who excelled in numbers or in personal prowess. The fleet of Xerxes was superior in numbers, as well as in the size of its ships, and as his army was numerous beyond anything known in modern times, it was easy for him to man it powerfully. But the situation of Salamis favoured the Grecians, as it hindered the Persians and their allies from displaying their whole force. The Greeks having determined to give battle rather than await it to their inevitable destruction, Themistocles bore down with the full impetus of a fresh breeze, which blew regularly every day. The Persians received the first attack undaunted, and even returned it with so much vigour that the Greeks began to falter, when, according to Herodotus, an heroic Athenian by the name of Pallene, retrieved their situation by boldly steering his galley into the midst of the enemy, and drawing his countrymen after him to his rescue. And now the height and sluggishness of the Persian vessels, even their excessive numbers thus embarrassed in a narrow strait, and the disconnected efforts resulting from the various nations of the allies, and from a plurality of commanders, threw them into utter confusion. Moreover, among the Persians and their allies, there was much disaffection; while, on the contrary, the Greeks had a good cause, and every thing at stake; their vessels, too, were light and manageable, and they were expert in manœuvring them; they did every thing in good order; finally, they had but one supreme commander, and he Themistocles. Under such circumstances, it is not much to be wondered at that they should have proved victorious.

There are one or two incidents, which took place during the battle, not a little characteristic of the mode of fighting and of the manners of the times. We are told of a Grecian galley being sunk by an Ionian of the Persian fleet; this, in turn, sustained a like fate, being run down by a galley of Egina. But, before their vessel sunk under them, the Ionians had time to throw themselves into the ship of their antagonists, and by the desperate bravery to which they were urged by their situation, seconded by their dexterity in the use of the spear, for which they were famous, gained possession of the Eginetic galley. Still more peculiar was the stratagem by which the queen Artemisia contrived to escape. She had opposed the engagement; but when it was determined to give battle, she displayed greater valour than any of the followers of Xerxes, so that he took occasion to say, as he viewed her conduct from his throne on a neighbouring eminence, that only the women of the fleet behaved like men. This unsustained courage involved her, at length, in imminent danger, and she found herself hotly beset by many enemies, when, as the only means of escape, she resorted to the stratagem of hoisting Grecian colours, and attacking a Persian ship, commanded by one Damasithymus, king of Calynda, which she speedily sent to the bottom. This deed, doubtless, cost her the less, that Damasithymus had once been her enemy. Her pursuers, seeing this, believed her vessel to be one of their own fleet, and so Artemisia escaped.

In the two centuries succeeding this battle of Salamis, many improvements were introduced into naval warfare. They originated chiefly with the Carthaginians, who had inherited all the commercial skill and enterprise of their Phœnician forefathers. No longer contented with the trade of Egypt, Phœnicia, the Red sea, Gaul, Spain, and Mauritania, and the narrow limits of the Mediterranean, they stood boldly forth beyond the Pillars, hitherto esteemed the *ne plus ultra* of the earth, and carried their commercial enterprises to the western coasts of Europe and Africa, and even to the British isles. So extended a commerce, and the spirit of monopoly with which it was carried on, led to the creation of powerful armaments; which were also necessary for the protection of the many colonies which Carthage possessed in Spain, Sicily, and elsewhere.

The galley was the form of ship used in war by the Carthaginians. Their *triremes*, as they were called by the Romans, from their having three rows of oars, were usually one hundred feet in length, ten in breadth, and seven in height. This form, long, low, and narrow, though not adapted to encounter a stormy sea, was admirably suited to move rapidly in smooth water; for, whilst the small breadth opposed little resistance in dividing the water, the extreme length made room for many rowers, and gave great impetus to the attacks of the beak. The bow curved upwards, forming a circular beak, which was faced with iron: or else it receded suddenly, having a single sharp point, like a ploughshare, projecting at the surface of the water, and intended to open the side of an antagonist, and cause her destruction. Frequently the beak was formed to represent a lion, tiger, or other ravenous beast calculated to inspire terror. It was always surmounted by the national emblem; thus an owl stood on the prow of an Athenian galley; a cock on a Phœnician or Carthaginian, and the eagle on a Roman. Here or at the stern were also placed the ensigns and standards, and trumpeters, standing beside them, sounding their shrill blasts to inspire courage at the moment of onset. From the bow to the stern there extended a flooring or deck, which served as a battle-field for the mailed and heavy armed soldiers who fought. The stern was covered with a circular shed or pavilion, richly carved and decorated with streamers and trophies. Under this was placed the *tutela*, representing some patron deity, to which sacrifices and prayers were offered, and which was held so sacred as to furnish a sanctuary to whoever took refuge there. From this elevated station, too, the commander surveyed the fight and directed the efforts of his followers. There were two distinct classes of officers and men in each galley. The commander of the soldiers was supreme, and under him the pilot, who took his station abaft, at the side of the steersman, directed all necessary evolutions and manœuvres. The pilot was assisted in the command of the sailors by his mate, and by the *agitator* or encourager of the rowers, whilst a musician marked the measure of the stroke, and, by the harmony of his voice and instrument, inspirited the rowers when weary with toil. As for the rowers themselves, they were placed below deck on rows of benches, ascending above each other diagonally, the bench of one serving for the footstool of his comrade immediately above and behind him. We read of five benched, eight benched, and even forty benched galleys; but this cannot possibly mean, as many suppose, so many distinct banks of rowers. (See the article *Galley*, where various theories regarding the constitution of the ancient war-vessels are given.) We have already said that the rowers were distinct from the soldiers who fought, for rowing was esteemed a great drudgery, and was not unfrequently, in ancient as in modern times, the punishment of malefactors, who were chained perpetually to the benches on which they rowed. It was, perhaps, from the infusion of such unamiable materials, that sailors came to be esteemed infamous and wicked wretches, totally destitute of humanity and religion. Galleys were steered with oars run on the quarters, and managed by men standing near the pilots, and ready to obey their orders. Sails were also used to ease the rowers, and attain a greater velocity, when the wind was fair; both masts and yards were, however, always taken down and stowed out of the way, on the eve of an engagement, and the oars alone used, thus enabling the galley to move and turn without reference to the direction of the wind. These sails were sometimes made of variegated stripes, and we occasionally read of the galley of an emperor or an admiral having sails of purple, embroidered with gold. The body of the vessel was tastefully painted, representing gods, animals, or historic scenes, and sometimes the oar-blades were richly gilded.

Such were the locomotive means of the galley. Its means of offence consisted in the various weapons and missiles used on land. Javelins and arrows were discharged in showers from the deck, or from turrets at the bow and stern. As a protection from these, a curtain of hides was used, from behind which the soldiers discharged their missiles in return, or thrust with very long spears, used only at sea. In the centre were engines from which rocks were projected of sufficient size to sink a ship; and, as the combatants approached, great masses of iron, from their form called *dolphins*, were let down from the elevation of the mast-head, and sometimes passed through the bottom of an adversary, to his inevitable destruction. Battering rams, which were beams pointed with iron, were also suspended from the mast, and forced with destructive effect against the enemy's side. But the great means of annoyance was the attack of the beak; and, in order to make it with complete effect, it was very desirable to gain the wind, so as to bear down upon an adversary with the greatest velocity, demolish his oars, open his side, or even overturn and run down the vessel. Earthen pots of live coals and pitch, and of combustibles ready to combine and burst forth in flames, were either cast from ship to ship, or so suspended over the beak, that when the shock took place they would fall on the deck of the assailed. It is said of Hannibal, an ancestor of the great Hannibal, that he threw, on one occasion, pots containing live snakes upon the enemy's deck, and, as he had conjectured, filled the crew with horror at so unwonted an attack, and availed himself of their consternation in securing the victory. Fire ships were also used at this early period with destructive effect. The line of battle was usually triangular, the admiral's ship being at the angle in advance, and the line of store-ships forming the base. Before engaging, it was usual for the admiral to pass in a small boat throughout his fleet, haranguing his followers, and urging them to do their duty. Thus inspirited, a shout of anticipated triumph would pass from ship to ship; and when the gilded shield was at length displayed as a signal for battle, the shrill trumpets sent forth their blasts, and the combatants rushed to the encounter, rending the air with shouts and war songs. The battle won, the victors returned to port, towing their prizes, their ships being decorated with fragments of the wrecks, themselves crowned with laurel, and singing pæans to Apollo. The richest of the spoil was reserved as an oblation to the gods, and broken, or even entire galleys were placed in the precincts of the temples.

Such was the state of naval warfare, until the Romans, incited by their contest with Carthage for the possession of Sicily, first turned their attention to naval affairs. Such was the invincible daring of this nation, that, having scarce ever dreamed of navigation, they yet resolved to attack the Carthaginians on their own element. At this conjecture, a Carthaginian cruiser, accidently stranded on their shores, furnished them with a model. But where should they procure mariners to man their galleys? This difficulty yielded to Roman resolution. Benches were established on the land; the recruits were placed with their oars, as if embarked, and an officer, standing in a conspicuous position, made signs with his hand, to indicate the instant when they should together dip their oars, and then sweep them with a concerted movement of the arms and body. In this way, a sufficient number of men were taught to row, during the construction of the galleys, and a fleet of 120 vessels, with nearly 40,000 oarsmen and soldiers, was equipped for sea. Before sailing, however, to meet the enemy, these hastily manufactured sailors were exercised for some time on board the galleys. After all it was probable that this fleet was as awkward and unmanageable as might have been expected, and that the consul Duilius, ere he had long been to sea with it, discovered that, though he had copied much from the Carthaginians, there was much still that had escaped him. For we find him soon calling up his ingenuity to devise some means of neutralizing the superior skill and seamanship of the Carthaginians; this he effected by the invention of the *corvus*. It was a bridge or platform planted at the bow, and which could be turned at pleasure from side to side, or hoisted up to a mast erected for the purpose. At length the two fleets came in sight, and prepared for battle. The Carthaginians, being superior in numbers, and still more so in experience and skill, were filled with contempt at the rude appearance of the Roman galleys, and their more clumsy evolutions. They were certain of victory. Nevertheless, as they approached nearer, the awkward appendage at the bow, which had at first excited ridicule, began to inspire mistrust. This was augmented when they found that the Romans paused not to discharge their missiles, but, receiving those of the Carthaginians, steered boldly on, until each Roman galley had struck an enemy, when the ropes that held the *corvus* suspended to the mast being loosed, it fell with fatal force upon his deck, crushing those who had collected to defend the entrance. The bars of sharpened iron with which the bottom of the bridge was armed, transfixed the deck, with those who stood in the way, and the two galleys remained firmly grappled. And now the Romans, receiving the enemy's arrows on their shields, raised their war-cry, and rushed, sword in hand, to the assault; seamanship and skill were set aside, and courage and personal prowess became the arbiters of the contest. The former confidence of the Carthaginians was only equalled by their present consternation. Great and terrible was the slaughter. Eighty galleys were either taken or destroyed, among them the famous galley of Hannibal, the Carthaginian admiral, which had once belonged to Pyrrhus. The admiral himself narrowly escaped in a small boat. This victory, if we consider the circumstances under which the battle was fought, is inferior to none in history. It was duly estimated at Rome; the most extraordinary honours were decreed to Duilius, he being the first Roman who enjoyed a naval triumph. A rostral column was also erected to him, upon which were placed the beaks of the Carthaginian galleys. This *columna rostrata* is still seen and admired in old Rome, where the stranger does not fail to visit it, and where, turning from the humiliating picture of modern degeneracy, he traces with pleasure an inscription which recalls the best days of the republic.

From this time until the invention of cannon, naval warfare underwent little variation. The emperors of Constantinople continued to observe the same system of annoyance and defence in their navy, which must have been considerable, as we read of an expedition sent to subdue Crete, consisting of 200 ships and 49,000 men. They wisely reduced the height of their galleys, using none but *dromones* of two tiers, having in all 100 oars, rowed by as many men. A level platform covered the rowers, upon which the soldiers drew up and fought as upon land. The captain stood at the poop between the two steersmen, whence he directed the efforts of his followers. Thence, too, he discovered and obeyed the signals of his admiral—an invention already introduced to signify orders at a distance. The line of battle was somewhat changed; from a triangle it had become a crescent. The horns pointed rearward, and the admirals stationed in the centre began the attack. The same means of annoyance were still employed: arrows were shot from bows and cross-bows; javelins were discharged from engines; and huge rocks were projected from machines, which, we are told, often found their way through the deck and bottom of the hostile vessel, destroying both galley and crew. But the most dreadful weapon then in use was the iron tube, from which the Greek fire was projected in streams upon the vessel and crew of an enemy. This combustible, which had been much earlier used, in the less destructive form of missiles, was of such fearful activity that nothing could resist it, and water, instead of extinguishing, did but augment its fury. Terrible must it have been to the northern pirates, of whom we are told that, imitating those of their countrymen who had invaded Europe by other routes, they descended in canoes, by the Borysthenes, into the Black sea. Having plundered its shores, they were hastening to seize upon Constantinople, when they were met by the fleet of the emperor. Hardly had they raised the war-shout, as they paddled their canoes to the assault, when they were met by well-directed streams of liquid fire, issuing from the prow of every Grecian galley. Consternation seized them, and they plunged into the sea, happy in having yet the alternative of a choice of deaths.* Though the attack of beaks was still continued, less importance was now attached to the point of gaining the wind. In order to escape from the torture of the fire-tube, it was more usual at once to grapple broadside to broadside, and, while the rowers assailed each other with pikes through their rowports, the soldiers rushed, with sword and buckler, to the attack, fighting desperately, hand to hand. Hence it is that, in the history of those times, we so frequently read of ten, twenty, and even thirty thousand men, slain in a single naval encounter.

At length, a great revolution in naval warfare was brought about by the introduction of cannon. They were first used by the Venetians against the Genoese, in 1370. It is a little singular, when we consider their efficacy for the destruction of ships, that they should not have been employed for this purpose until a whole century from their first use in Europe by the Saracens, in the defence of Niebla, and nearly thirty years from their general introduction, as an implement of war on land, at the siege of

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* The Greek fire has lately been reinvented by an American, of the name of Brown. He discharges it, like any other fluid, from a common engine, and, from its resinous and cohesive nature, projects it much farther. As it passes out of the tube into the open air, a match, placed at the end, converts it into a liquid fire, of a destructive energy, not at all inferior to what is attributed to that of the Greeks. He has offered his invention to the American government; and, as connected with a system of steam-batteries for the defence of a coast, it would prove terribly efficacious.

Algeziras. When first introduced, the cannon were mounted on the deck which covered the rowers, and were either made to protrude over the rail, or else were pointed through port holes pierced through the bulwark which defended the crew. In the *galleas*, which was first used at Lepanto, there was one row of ports between the oars, and then batteries of heavier cannon upon the poop and forecastle. Notwithstanding all these innovations, we shall yet find that the ancient mode of naval warfare was, in a great measure, maintained in that renowned naval battle, the battle of Lepanto.

The battle of Lepanto was fought between the papal, Venetian, and Spanish fleets, and that of Selim, sultan of Constantinople. In September, 1571, the Christian fleet was collected, and made ready, in the port of Messina. It consisted of 250 ships, manned by 50,000 men, and was placed under the command of don John of Austria, natural son of Charles V., for whom expressly the title of *generalissimo* was then invented. The pope, having proclaimed a general season of fasting and prayer throughout Christendom, sent a strong corps of ecclesiastics to officiate in the fleet, and a consecrated standard to be displayed from the ship of the admiral. Absolution was promised to every sinner who should fight for the faith, and heaven was opened to the slain. Don John was urged to give immediate battle, and to feel secure of victory. Selim, on the other hand, was not backward in preparing to meet the danger. Though part of his forces was still employed in reducing the island of Cyprus, which was the original subject of contention, he yet succeeded in equipping a fleet still larger than that of the Christians. It was intrusted to the pacha Ali, who proved himself well worthy of the charge. Nor was the sultan slow, on his side, in promising all sorts of good things to the defenders of the faith, and in picturing the joys of a Mohammedan paradise, as the prize of martyrdom. Both parties were to fight the battle of the Most High. The two fleets came together in the gulf of Lepanto. What the Christians wanted in numbers, they made up in superiority of equipment. The prows of their galleys were closer, and better defended, and their soldiers better provided with offensive and defensive armour. They made general use of helmets, coats of mail, and fire-arms, whilst many of the Turks defended their bodies with large leathern shields, and had no more destructive missiles than arrows. Moreover, fortune turned against them at the moment of onset; for the wind, which had hitherto been favourable to them, now blew in the sails of the Christians. The battle, as of old, began with the admirals. Don John and Ali, after a short cannonade, closed and grappled. Both crews rushed to the assault, meeting, in deadly struggle, upon the gunwales. Three times did the Spaniards gain the deck of their adversary, and as often were they driven back. Perhaps the Turks would have followed up their advantage to complete victory, had not don John, in that critical moment, received a timely reinforcement of 200 men. By their assistance, the Turk was again boarded, and no longer with doubtful success. The slaughter was indiscriminate and terrible, the crescent being quickly lowered, and replaced by the cross, whilst the severed head of Ali, planted on a pole, and hoisted at his own masthead, filled the breast of his followers with momentary consternation. Scarce was this result manifest, ere the cry of *Victoria! victoria!* pealed from the ships of the Christians; and, led on by a host of heroes—a Colonna, a Veniero, a Doria—they rushed furiously upon the enemy. Nor did the Turks tamely yield the victory, which they had, of late, so often won. The ships grappled; the enemies fought hand to hand, and sword to cimeter; pikes, javelins, and arrows, cannons, matchlocks, and arquebusses, aided the fury of the combatants. Turks and Christians had never fought so valiantly, though that was, emphatically, the age of daring. At length, whilst the result was yet doubtful, the Turkish galley-slaves, taking courage at the partial success of their fellow-Christians, and dreading the effect of the reverse upon their own condition, suddenly rose, broke their chains, attacking their masters with them, or with whatever other weapons fury furnished them, and repaid them, in a few short moments, for years of cruelty. In an opposite manner, the criminals who performed the same office at the oar in the Spanish and Italian galleys, having asked leave of their officers, and been unchained and armed, boarded the enemy with a fury rendered irresistible by despair, a recklessness which had nothing to lose, and the double hope of meriting liberty or obtaining martyrdom. At length, the few Turks that remained began to think of flight. Thirty galleys alone escaped to Constantinople, through the skill of the intrepid corsair Ulucciali, who carried away the standard of Malta, as a trophy.* A few reached the neighbouring shore, and abandoned their ships; 130 were taken; the rest were either sunk, burned, or battered to pieces; 10,000 Turks were taken, 25,000 slain; 15,000 Christians were released from the servitude of the oar. Nor was the victory cheaply purchased—10,000 Christians were among the number of the victims. Beautiful had been the display of the encountering fleets, but now how changed the spectacle! Shattered fragments of wrecks and masts covered the sea, which was everywhere streaked with human blood, or strewed with limbs and disfigured corpses. The whole of Europe resounded with shouts for this glorious victory, and with the praises of its hero. He was pronounced the greatest warrior of the age; the Christians of Macedonia and Albania tendered him the sovereignty of their country; and, as for the pope, when the news reached him, he is said to have exclaimed, in a holy ecstasy, "There was a man sent of God, whose name was John."

The rapid improvements which the discovery of America effected in naval architecture, for commercial purposes, extended equally to its other branches. A gradual improvement took place in the form and adaptation of ships of war, and they were, at the same time, progressively increased in force and size, until, before the close of the sixteenth century, we already read of Spanish and Portuguese ships of eighty and ninety guns. In the last century, ships of war at length attained a size which may be considered as a maximum; for nature herself has set bounds, to surpass which would be, if not impossible, at least inconvenient. Many harbours exclude vessels of excessive depth; the trees of which ships are made do not exceed a certain growth; and man, who is to construct, equip, and finally manœuvre these wondrous machines upon the deep, though able to effect much by an advantageous application of his strength, and by concerted efforts, is yet a being of limited powers. The English Caledonia, the French

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* The Corsair carried away a more precious treasure in the person of the poet-hero Cervantes. His intrepidity had hurried him among the first on board of the enemy's galley, to which his own was grappled; but his comrades were repulsed, the grapnels broken, and he, left wounded on the deck, was carried away by the renegado, as he himself tells us, in the beautiful episode of *El Captivo*, "the only captive among so many liberated, the only sad among so many rejoicing Christians." The matter might, however, have been worse. Had Cervantes been slain, instead of taken at Lepanto, we had never known the valiant don Quixote, nor the facetious Sancho.

Commerce de Marseilles, and the *Santissima Trinidad*, may almost be looked upon as magnificent monsters. The ship carrying one hundred guns, on three uniform decks, may be considered as the best adapted to unite formidableness and efficiency.

When this increase of size took place, the oar ceased to be a fit agent to move so weighty a machine, and it only remained, by the adaptation of sails, to make the most of that which nature has placed at our disposal, in the restless and ever-moving element which surrounds us. Galleys have been long discontinued on the ocean, and are now only used in the Mediterranean, where immemorial usage renders every thing hereditary. With this revolution in the manner of propelling vessels of war, an equal one was introduced in the method of fighting. Their augmented size rendered it more inconvenient to grapple and fight hand to hand, and risked the destruction of both ships, if the weather were tempestuous. Hence this mode of combat was rarely resorted to; and battering with cannon, at a favourable distance, until one party or the other struck, became the ordinary mode of naval warfare. This we shall now exemplify, by briefly describing the present mode of engagement, and relating a few instances of modern naval battles between single ships and fleets.

When two adverse ships come in sight of each other upon the ocean, accident decides, usually, which is to windward. To be to windward, or to the side from which the wind comes, is always esteemed an advantage. If the weather ship be of inferior force, it enables her to keep out of action much longer, and, though a poorer sailer, she may do so until the intervention of night increases the chances of escape. If, however, the weather ship be of superior force, she is enabled to bear at once down, and direct her head upon the enemy, and, having the advantage in sailing, must soon be alongside of her. We will, however, suppose a case in which two equal ships meet, and are mutually anxious to engage. Then, also, the weather-gage is an advantage, for the ship to lee-ward, careening to the breeze, exposes her side below wind and water, and, if struck there, and afterwards forced to tack and change her careen, or if merely brought upright, the shot-holes thus made are thrown out of the reach of repairs from without, and may cause her sinking. The ship to windward, on the contrary, has her lee-side exposed to the attack, and the ordinary water-line depressed below the surface, in proportion to the strength of the breeze. In this situation, if she receives dangerous shot-holes at the water's edge, by changing her tack, she may bring them above the surface, so as to stop the leaks. Being to windward, moreover, confers the advantage of heaving up at pleasure to cross an enemy's bow, or stern, for the purpose of a raking fire.

Assuming the advantage of the weather-gage, let us prepare for action. Topsails, top-gallant-sails, jib, and spanker, with the courses hauled up, ready to be set again, are good sails to fight under, for with them your ship is under perfect command to advance, manœuvre, or lie to. If there is an appearance of squally weather, it is well to have a reef in the topsails, in anticipation. The crew are called to quarters by beat of drum, every man going to the station which has been rendered familiar to him by frequent training, under the eye of his officers. The commander, standing in a conspicuous station on the quarter-deck, watches his own ship and the enemy, and conveys the order that the occasion may require by voice, or through the medium of his aids. Under him, the first lieutenant commands the offensive and defensive operations, and effects the various evolutions which he may direct, in relation to the position of the ship. The clues are stoppered, to keep the sails spread in the event of the sheets being shot away, and the yards are hung in chains, to obviate a like inconvenience from the cutting of the ties. The carpenter rigs the pumps to prepare for a leak, collects his shot-plugs to stop holes in the side, and fishes of wood to strengthen a mast, or yard, that may be wounded, and in danger of falling. The surgeon prepares, in the cockpit, to relieve the wounded. Tubs of water are collected in the tops, channels, and on deck, to be ready to extinguish fire; the decks are wet, to prevent the explosion of powder, and put out sparks that may fall there, and also sanded to prevent the men from slipping when splashy with blood or water. Finally, plenty of wads and shot, round, grape, and canister, are collected beside the guns, and the magazine is opened and lit by the gunner and his crew, who prepare to pass the cartridges to the powder-boys.

And now, having given three cheers, you bear down upon the enemy. It is a great object, in battering from ship to ship, to rake your enemy, if possible; that is, to get across his bow, or stern, out of reach of his guns, whilst yours sweep the whole length of his deck, with fatal execution. If it is desirable to rake your enemy, it is equally so to avoid being raked in return. This double advantage can only be attained by superior sailing, or by great skill in manœuvring. In directing your fire, it is best to aim between wind and water, and also in the direction of the masts, for in this way the enemy may be soonest disabled, and a victory gained with the least destruction of life. If, on the contrary, your own spars be so disabled that the enemy, having the worst in other respects, might yet effect his escape, from your inability to make sail in pursuit; or even in the more desperate case of your being every way worsted, you may yet profit of your situation to bear down and board, as the last alternative. In the case of this last chance, a hopeless cause may sometimes be restored; for, in boarding, headlong valour, oftener than numbers, decides the struggle. When the enemy signifies that he yields, by hauling down his colours, a prize-master and crew are detailed; the prisoners are removed and chained, and as much exertion is made in repairing damages as was before exercised in effecting them.

Of all the naval battles, in ancient or modern times, none has ever been more obstinately contested than that which took place, during the American revolution, between the *Bon Homme Richard*, as she was called (after doctor Franklin's Poor Richard), and the British frigate Serapis. The first was commanded by commodore Paul Jones, the last by commodore Pearson, a very distinguished officer. The Richard carried fifty-six guns, and 380 men; the Serapis fifty-nine guns, and 320 men. The former was old and decayed, with a motley battery, throwing only 282 pounds at the single broadside, and twenty of her best men, with the second lieutenant, were absent during the whole action. The Serapis, on the contrary, was a new ship, of approved construction, considered the fastest sailer in the British navy; and, besides her superiority in number of guns, they were of heavy calibre, throwing 340 pounds at a single broadside. Jones, having borne down to cut off the Baltic fleet from the harbour of Scarborough, the Serapis and her consort stood out, to divert the attention of the American ships, and give the convoy time to escape. In this way the battle began. One of Jones's consorts engaged the consort of the Serapis; the other took no part in the action till towards its close, when it fired, with equal injury upon both. No guns were fired from either ship until they approached within pistol shot, when

Pearson cried out, "What ship is that?" This was at eight in the evening. The sky was beautifully clear, and the sea smooth;—the moon, just then rising, lit the combatants, whilst it enabled crowds of people, collected on Flamborough Head, to watch the progress of the battle. When commodore Pearson had waited in vain for an answer to his challenge, the Serapis opened a terrible fire upon the Richard. It was at once returned; but three of the Richard's heaviest guns burst at the discharge, not only becoming lost for the rest of the fight, but destroying more men than the whole broadside of the Serapis, and scattering death and confusion on every side. The battle had not continued long, ere Jones found that he was suffering so much from the Serapis being able, by her superior sailing, to choose raking positions, that he would soon have to yield if the contest continued so unequal; he therefore ordered his ship to be laid on board the Serapis. This manœuvre did not succeed, for the Richard could not bring a single gun to bear. Jones therefore backed his sails, and sheered off, when Pearson, thinking the American was about to yield, because his fire had ceased, asked him if he struck; to which Jones answered, that he had not yet begun to fight. He was not long, however, in making a commencement; for, having sailed by the Serapis, he once more put his helm up, and ran across her bow. Her jib-boom came over the Richard's poop, and Jones himself assisted the master in making the jib-stay, which had been shot away, and hung down upon his deck, fast to his mizzen-mast. At the same time, the anchor of the Serapis hooked one of the Richard's ports, so that when presently Pearson anchored, to let his enemy sweep clear of him with the tide, both ships swung beside each other, the stern of the Richard to the bow of the Serapis, and their starboard sides so close together that the guns met, muzzle to muzzle; the rammers entered opposite ports, and were dragged from those who used them, who presently began assaulting each other. It is a singular proof of the coolness of Jones, that, while engaged with the master in making the vessels fast, he should have thought to check him for his profanity, saying, "Mr Stacy, this is no time for swearing; in the next moment you may be in eternity. Let us do our duty." Thus grappled, the two ships kept up a long and desperate struggle for victory. In battering, the superior metal of the Serapis gave her a decided advantage; her shot went through and through the rotten sides of the Richard, cutting the men in pieces, and destroying them with splinters. The rudder was destroyed; the quarter beat in; and while the water entered on every side, one of the pumps was shot away. There was already four feet water in the hold, and it was gaining. Upon this the carpenter, instead of concealing the ship's condition from all but the captain, cried out that she was sinking. The panic spread. The master-at-arms, moved by the supplications of a hundred British prisoners confined below, released them from irons; and the gunner ran terrified on deck, and bawling for quarter. Among the prisoners thus left at large, one of them, a shipmaster, crawled through the ports to the Serapis, and told captain Pearson to hold out, for he had begun to meditate a surrender. Nevertheless, Jones quickly recovered from his desperate position. He punished the cowardice of the gunner by throwing his pistols at him, one of which fractured his skull, and precipitated him down the hatchway. At the same time, he repulsed an attempt to board from the Serapis, and removed the danger of so many prisoners at large below by employing them at the pumps, and telling them to work or sink.

Whilst the battle had taken this unfavourable turn below, the face of affairs was reversed above, by the exertions of a few men stationed in the tops of the Richard. According to Jones's orders, they had just directed their fire into the enemy's tops, until not a man remained alive, except one in the fore-top, who kept loading his musket, and dodging, now and then, from behind the mast, to fire. This bold fellow was at length struck by a ball from the Richard's main-top, and sent headlong upon deck. And now the exertions of the sharpshooters were all turned to clearing the decks of the Serapis. Some of the bravest even passed, by the yards, into the tops of the Serapis, whence they threw stinkpots, flasks, and grenades down her hatches, stifling her men, and firing the ship in various directions. At this time, both ships having taken fire, the cannonade was suspended, to extinguish it. Jones soon renewed it, however, from some guns which alone remained in order on the forecastle, and which he directed himself. At the same time, a grenade, thrown from the Serapis's top, having bounded into the lower deck, and fired some loose powder, this communicated to the cartridges, which had been brought from the magazine faster than they were used, and lay carelessly upon the deck; and a general explosion took place, by which every man in the neighbourhood was blown to pieces, or dreadfully burned. No way remained for commodore Pearson to save the remnant of his crew, but to yield; but even this it was not easy to signify, for none of his crew would take down the flag, which had been nailed, before the action, to its staff; and he was compelled to perform the perilous and humiliating task with his own hand. Thus ended the battle of the Bon Homme Richard and Serapis. The victory was dearly bought, for the carnage on both sides was terrible. The Bon Homme Richard lost three hundred men, in killed and wounded; and nearly all the last died, from the indifferent care which they received, and the dreadful gale which followed the battle. The loss of the Serapis was nearly as great. Of the men who were blown up, some lingered until the flesh dropped from their bones, dying in excruciating agony. The Poor Richard, assailed by fire and water, was abandoned to her fate, and went down, carrying with her many of her wounded crew.

The battle of Trafalgar is a renowned instance of naval warfare by fleets. It occurred near Cadiz, between the allied French and Spanish fleets, of thirty-three sail of the line, and the British fleet, of twenty-seven sail. The force of the allies was far superior in ships, guns, and men, and they had a brave and skilful commander in admiral Villeneuve; but there were circumstances that more than counterbalanced the disparity. The Spaniards had no national interest in the struggle, and between them and the French there was no cordiality. The allied ships, too, had been hastily refitted, and, having just put to sea, were very inefficient; for their crews, belonging, as they did, to nations which had little commercial marine and few seamen, were made up, in a great measure, of soldiers, who had never been long enough embarked to get their sea legs. The British ships, on the contrary, were in the finest order; their crews had been actively employed during years of war; they were commanded by veteran officers, each a hero of many battles, all obeying one only admiral—Nelson of the Nile.

Having taken his station off Cadiz, Nelson waited the sailing of the enemy, who were ignorant of his force, and had determined to put to sea. October 19, 1805, the frigates in shore repeated the signal that the enemy were coming out; on the 20th, they were all at sea off Cadiz; and on the 21st, after much manœuvring, the two fleets came in sight, with a mutual determination to fight. This day had been a festival in the family of Nelson, because it was the anniversary of a victory gained by his uncle. To Nelson, whose peculiar mind was no stranger to superstition, the omen was most welcome. Yet, though he expected to win the battle that was about to be fought, he felt equally sure that he would not survive to enjoy it. He knew that his life would be aimed at by the Tyrolese sharpshooters of the enemy, and, far from dreading it, he seemed to desire to die in the moment of victory. He wore, as usual, his uniform of admiral, covered with stars and decorations, which could not fail to attract the bullets of the riflemen, and which filled his followers with apprehension. Yet it was in vain to ask him to remove them. Even when persuaded by Hardy to order other ships to pass ahead, he still carried all sail on the Victory, thereby rendering it impossible for the order to be obeyed.—The allied fleet formed their line of battle on the larboard tack, the wind being at south-west. Trafalgar lay to leeward, and the bay of Cadiz was open for escape. The ships were drawn up in a double line in close order, the intervals in the first line being filled by the ships of the second, with room to fire between. This combined the advantage of a dense, unassailable column, with a sufficient interval to obviate the danger of contact among the ships. Nelson bore down also in a double line, himself leading the left of fourteen ships in the Victory, and Collingwood in the Royal Sovereign, the right line of thirteen ships. His object was to break the line of the enemy in two points, separating and overpowering them in sections inferior to his own. Above all, he directed his captains to remember that his object was a close and decisive action; and that if his signals were not seen, no captain could go wrong in placing himself quickly and closely alongside an enemy. The wind was light, and the British fleet, under a crowd of sail, bore gallantly before it, rising and falling gracefully upon the long swell that rolled towards the bay of Cadiz. Nor was the array of the allies less noble and imposing, as they firmly awaited the approach of their enemies, drawn up in their double line, and with the sun shining full upon their white sails and frowning broadsides. The scene—the purpose—were full of sublimity; and to Nelson, who, independent of his thirst of glory, fancied that in destroying Frenchmen, he was about to serve humanity, this moment must have been the proudest of his life. As he gazed upon his anticipated prize, he asked captain Blackwood what he would esteem a victory. The answer was that, considering the noble manner in which battle was offered, the capture of fourteen sail would be a brilliant result. "I shall not," said he, "be satisfied with less than twenty." Presently Blackwood took leave, to return to his own ship, and expressed the hope soon to congratulate the admiral upon the accomplishment of his wish. Nelson pressed his hand affectionately, and said—"God bless you, Blackwood! I shall never see you again." And now, from the mast-head of the Victory was unfurled that eloquent signal—"England expects every man to do his duty!"—In consequence of the second column being steered more off the wind, at a less acute angle with the enemy's line, Collingwood came much sooner into contact with it; broke through it astern of the Santa Anna, firing raking broadsides on either hand as he passed, and engaging the Spaniard to leeward, at the muzzles of his guns. At the same time, three or four other ships gathered round, pouring their broadsides into the Royal Sovereign. "See," cried Nelson, "how that noble fellow, Collingwood, carries his ship into action!" And Collingwood, on his side, appreciating the feelings of his chief, was just then saying to his captain, notwithstanding the uproar and carnage,—"Rotherham, what would Nelson give to be here!"—Meantime Nelson was bearing down, exposed to a raking fire from all the ships under his lee, without being able to return a broadside. His secretary was killed beside him; directly after, a double-headed shot struck a party of marines drawn up upon the poop near him, killing eight of them; and in another minute, a shot passed between the admiral and captain Hardy. Each for an instant believed the other killed. At length the Victory, having run between two of the enemy's ships, opened both her broadsides with tremendous effect. Soon after, she ran on board the Redoubtable; which ship was closely engaged by the British Temeraire; and, another enemy having fallen on board of the Temeraire, the whole four lay desperately grappled, broadside to broadside. Whilst to the left the Victory received and answered the fire of the Bucentaure and Santissima Trinidad, on the right she depressed her guns so as not to send the shot through into the Temeraire. The Redoubtable let down her lower deck ports, for fear of being boarded through them, but kept up a fire from the upper batteries and from small-armed men stationed in the tops. From a generous though mistaken and Quixotic sense of humanity, Nelson made no use of small arms in the tops, either to clear the enemy's decks and pick off officers, or to silence the fire of their topmen. To this fault he owed his death; for after he had twice ordered the fire upon the Redoubtable to cease, because she seemed to have struck, a ball, fired from her mizzen-top, which was quite close to the poop of the Victory, struck his epaulette, and entered his back. He fell with his face upon the deck. Hardy turned round as some men were raising him.—"They have done for me at last, Hardy," said he. As they carried him down the ladder, he remarked that the tiller ropes had been shot away, and ordered them to be replaced. Then with his handkerchief he covered his features and decorations, desirous now to conceal from his crew, lest they should be disheartened, what he had been unwilling to hide from the enemy. Soon after he reached the cockpit, his wound was discovered to be mortal; he felt it himself, and insisted that the surgeon should leave him, to attend those whom he might yet save. He was in great pain, and intensely anxious to know how the battle went. "Will no one bring Hardy to me?" he asked. "He must be killed! He is surely dead!" At length Hardy came, and the two friends shook hands in silence. After a pause, the dying man faintly uttered, "Well, Hardy, how goes the day?"—"Very well; ten ships have already struck." Finding that all was well, and that no British ship had yielded, he turned to speak of himself. "I am a dead man, Hardy! I am going fast! It will soon be all over with me!" Hardy hoped that there was yet a chance of recovery. "O no! it is impossible. I feel something rising in my breast that tells me so." The surgeon asked him if he suffered much. He answered, so much that he wished himself dead. "And yet," he added, thinking, perhaps, of the new honours that awaited him, "one would like to live a little longer."—Captain Hardy, having been again on deck, returned, at the end of an hour, to his dying friend. He could not tell, in the confusion, the exact number of the allies that had surrendered; but there were at least fifteen; for the other ships had followed their admirals into action, breaking the enemy's line, and engaging closely to leeward, in the same gallant style as the Victory and Sovereign. Nelson answered, "That is well;—but I bargained for twenty." And his wish was prophetic; he had not miscalculated the superiority of his followers; twenty actually surrendered. Having ordered the fleet to be anchored, he again spoke of himself.—"Don't throw me overboard.—Kiss me, Hardy." Hardy knelt down, and obeyed in silence. "Now I am satisfied.—Thank God, I have done my duty."—Hardy kissed him again, received his blessing, and then took leave of him for ever.

Of late years, the practice of naval warfare threatens to undergo a great revolution, from the introduction of steam navigation, and from the use of bombs, discharged horizontally, instead of shot from common cannon. Experiments have been tried on hulks, by bombs projected horizontally, with terrible effect. If the projectile lodged in a mast, in exploding, it overturned it, with all its yards and rigging; if in the side, the ports were opened into each other; or, when near the water, an immense chasm was opened, causing the vessel to sink immediately. If it should not explode until it fell spent upon deck, besides doing the injury of an ordinary ball, it would then burst, scattering smoke, fire, and death on every side. When this comes to pass, it would seem that the naval profession would cease to be very desirable. Nevertheless, experience has, in all ages, shown that, the more destructive are the engines used in war, and the more it is improved and systematized, the less is the loss of life. Salamis and Lepanto can either of them alone count many times the added victims of the Nile, Trafalgar, and Navarino. One effect of the predicted change in naval war, it is said, will be the substitution of small vessels for the larger ones now in use. The three decker presents many times the surface of the schooner, while her superior number of cannon does not confer a commensurate advantage; for ten bombs, projected into the side of a ship, would be almost as efficacious to her destruction as a hundred. As forming part of a system of defence for our coast, the bomb-cannon, mounted on steamers, which can take their position at will, would be terribly formidable.

When all nations shall be self-governed, and shall cease to exercise that injustice which almost invariably springs from the passions of individuals, then we may hope to realize the vision of an unbroken peace, and naval war, like every other, may be dismissed as barbarous. But, until that happy day arrives, our character, situation, and interests, all prompt us to watch over and improve our navy. Naval war may be carried on with infinitely less expense of life and money than war upon land. While a navy is impotent to the subversion of our liberties, it goes forth to meet the danger at a distance from our shores. Our fields are saved from desolation; our peaceful citizens are left to cultivate them, undisturbed by the turmoil of approaching war; and are spared from spoliation, slaughter, famine, pestilence, and all the crimes and their attendant curses, that follow in the train of armies. (See *Ship*, and *Navigation*.) We subjoin the following table of the various existing navies, in 1830. It may be remarked, that, in comparing the cost of British and foreign shipping, it is usual to estimate it by the tonnage; but this is a very false criterion; for while foreign ships are accurately measured, our ships are measured so that a vessel of 150 tons register generally carries 220 tons of a mixed cargo, and a vessel registered at 400 tons seldom carries less than 600. If this difference be taken into account, it will be seen, that the northern nations have no considerable advantage in the cheapness of their ships over the British, and it is generally admitted, and on good grounds, we believe, that ships built in the ports on the Baltic do not last so long as those built in this country.

Navy of	Class of Vessels.	In Commission.	In Ordinary.	Building.	Total.	Total of Officers and Men.	Annual Cost.
Great Britain,	Ships of the line	15	87	19	121	35,688	26,124,444
	Frigates	47	124	27	198		
	Sloops, brigs, &c.	122	42	54	218		
		184	253	100	537		
France,	Ships of the line	11	22	20	53	20,958	12,804,000
	Frigates	35	6	18	59		
	Sloops, schooners, &c.	155	8	35	198		
		201	36	73	310		
United States,	Ships of the line		7	5	12	6,345	2,879,253
	Frigates	5	5	7	17		
	Sloops	12	4		16		
	Schooners, &c.	3	4		7		
		20	20	12	52		
Russia,	Ships of the line	17	9	9	35		
	Frigates	12	10	12	34		
	Sloops of war, &c.	33			33		
		62	19	21	102		
Sweden,	Ships of the line		4	2	6		
	Frigates			1	1		
	Schooners and gun boats			42	42		
			4	45	49		
Denmark,	Ships of the line				3		
	Frigates				6		
	Corvettes, schooners, &c.				83		
Netherlands,	Ships of the line				7		
	Frigates, corvettes, &c.	30	23		53		
Spain,	Ships of the line	3	3		6		
	Frigates	8	4		12		
	Sloops, schooners, &c.	25	69		94		
		36	76		112		
Mexico,	Ships of the line		1		1		
	Frigates		2		2		
	Sloops, &c		5		5		
			8		8		
Colombia,	Ships of sixty guns	1	1		2		
	Corvettes, &c.	2	3		5		
		3	4		7		
Brasil,	Ships of the line				1		
	Frigates				7		
	Corvettes, &c.				44		
					52		

Buenos Ayres has a brig of eighteen guns, and a few schooners. Chile has two small frigates, and a few smaller vessels. Peru has two sloops of war, and a few schooners. Hayti has a few gun-boats and *guarda-costas*.

NAXOS (in the most ancient times, *Dia*, and *Stongyle*; but now *Naxia*); the largest island (169 square miles, with 10,000 inhabitants) in the Greek department of the central Cyclades; lat. 37° 2′ N.; lon. 25° 30′ E. It contains a city of the same name (with 200 inhabitants), forty villages, a castle, a harbour, and is the seat of a Greek and a Catholic bishop. Its extraordinary fertility, and the fable of Bacchus, to whom it was consecrated, made it celebrated in antiquity. The ruins of a temple of Bacchus are still to be seen near the fountain of Ariadne. It abounded in grain, wine (which was considered the best in Greece), excellent fruits, and marble, of which the kind called *Ophaltes*, or *Ophites*, was much used. This marble hardens in the air, and stands for centuries undecayed. The inhabitants ascribed the uncommon fertility of the island, on account of which it was often called *Little Sicily*, to the influence of Bacchus, its guardian deity. Festivals in honour of Bacchus, to whom altars and temples were dedicated, were celebrated here. It was here, also, that the deity consoled Ariadne, when deserted by Theseus. The first inhabitants of the island were said to have been Thracians, who were afterwards subdued by the Thessalians, under the command of Otus and Ephialtes. The Thessalians having deserted the island, on account of the continual drought, the Carians are said to have taken possession of it, shortly after the Trojan war, under a leader named Naxos. Pisistratus reduced the island to dependence on Athens. After the death of Pisistratus, Naxos regained its freedom, and was extremely flourishing, but, soon after, shared the fate of most of the islands of the archipelago, and fell under Persian domination. But, when Xerxes attempted to subdue Greece itself, the Naxians took this opportunity of recovering their freedom in the battle of Salamis and Platæa. During the Mithridatic war, the island was subjected to the Romans. The triumvir Antony then placed it under the protection of the Rhodians, but withdrew it, on account of their abuse of their power. It remained in a state of freedom till the time of Vespasian, who reduced it to a Roman province. It afterwards shared the fate of the Roman empire of the East, and fell, with the remaining islands of the archipelago, into the hands of the Turks, who retained possession of it until it was attached to the new Greek state.

NAYLER, James, an English Quaker of the seventeenth century, remarkable for his enthusiasm and sufferings, was the son of an industrious small farmer, near Wakefield, Yorkshire, where he was born in 1616. He had a good natural capacity, and was taught to read and write. At the age of twenty-two, he married, and removed to Wakefield, where he remained until the breaking out of the civil war, in 1641. He then entered the parliamentary army, in which he served eight years. Returning home, he remained there until 1651, when the preaching of George Fox made him a convert to Quakerism. In the beginning of the following year, he imagined that he heard a voice calling upon him to renounce his father's house, and become an itinerant preacher. He attended to this fancied inspiration, and soon distinguished himself among those of kindred sentiments, both in London and other places, until, in 1656, he was committed to Exeter jail, for propagating his opinions. At this time, his own enthusiasm, and the extravagant admiration of some female followers, seem to have produced an incipient derangement, which induced Fox, and the more formal body of Quakers, to disown him. On his release from imprisonment, he repaired to Bristol, where his followers formed a procession, and led him into that city in a manner which they intended to resemble the entrance of Christ into Jerusalem. For this, Nayler, and several of his partisans, were committed to prison and afterwards sent to London. He was declared guilty of blasphemy by parliament, and sentenced to a double whipping at different times, branding, boring of the tongue with a hot iron, and imprisonment and hard labour during pleasure. This sentence was illegal, the house of commons not being possessed of any power beyond that of imprisoning during the session. It was, however, fully inflicted upon the unhappy man, who ingenuously acknowledged the extravagance of his conduct; and, having afforded satisfactory evidence of his contrition, upon his enlargement, was again received into the communion of the Friends. He died in 1660, in the forty-fourth year of his age. Nayler uttered, on his death-bed, sentiments of resignation, which exhibit an intensity of feeling, and a beauty of expression, that show him to have possessed no common mind. His writings were published in a single volume.

NAZARENES; a name sometimes given to the first Christians by their adversaries, and, even to this day, there exist, in Eastern Asia, some Christian congregations under this name.—The sect of Nazarenes, which originated as early as the second century, in Palestine, believed it was necessary to unite the Jewish ceremonial law with the precepts of Jesus, and refer to a Hebrew Gospel of Matthew. The Ebionites (the poor) went still further in the observance of the Mosaic law, rejected, at the same time, the Epistles of St Paul, and doubted the divinity of Christ, whom they considered but a perfect man. Like the Nazarenes, with whom they have a common country and time of origin, but are by no means to be confounded, they had a Hebrew original Gospel. Both sects were unimportant, and seem to have ceased in the fourth century.

NAZARETH, or **NASRA**; a town in Syria (Palestine), in the pachalic of Acre; fifty miles North of Jerusalem; lat. 32° 42′ N.; population, about 2000, mostly Christians. It has an old castle, a Greek church, a Catholic convent, with twelve or fourteen friars. It consists of a collection of houses scattered irregularly near the foot of a hill. It is memorable for having been the residence of our Saviour and his family during the first thirty years of his life. It was once the see of an archbishop, removed to Monte Verde, in Italy. Nazareth held the third rank among the metropolitan cities dependent on the patriarch of Jerusalem. The Hebrews continued to inhabit it in the time of the Romans, till the reign of Constantine; and after that epoch, it passed alternately from the Christians to the Saracens. Here are many places reputed holy, to which pilgrims are conducted. The church attached to the convent is handsome, and is erected over a cave, which is asserted to have been the residence of the Virgin Mary. When the plague rages here, the sick come eagerly to rub themselves against the church hangings and pillar, believing thus to obtain a certain cure. The monks show, also, the workshop of Joseph, and the precipice where Christ is said to have saved himself from the fury of the multitude; also, as the most venerated object, the table of Christ, being the stone on which it is pretended that he ate before and after his resurrection. In a valley near it is a spring, denominated by the early pilgrims the "fountain of the Virgin Mary."

NAZARITES, among the Jews; persons who devoted themselves to the peculiar service of Jehovah, for a certain time or for life. During their vow, they did not cut their hair, or drink any strong drink, or approach a dead body. It was foretold of Samson, that he should be a Nazarite unto God from the womb. So Hannah vowed her first born son (Samuel) to Jehovah all the days of his life, with the promise that no razor should come near his head. The law of the Narazites (from the Hebrew *nazar*, to separate) is contained in Numbers, vi. 1—21.

NEAL, Daniel, an English dissenting divine, and historian of the Puritans, was born in London, Dec. 14, 1678. In 1697, he entered as a student in a seminary conducted by Mr Roe, a dissenting minister, after which he studied at the university of Utrecht. On his return to London, in 1703, he began to officiate as a preacher, and, in 1706, succeeded doctor Singleton as minister of a congregation in Aldersgate street. Although assiduous as a minister, he found leisure for literary labours, and, in 1720, published his History of New England (2 vols. 8vo); and, soon after, a Narrative of the Method of Inoculating for the Small-Pox in New England. In 1732, he sent into the world the first volume of his History of the Puritans (8vo), the second, third, and fourth appearing in 1733, 1736, and 1738. This work called forth a Vindication of the Doctrine, Discipline, and Worship, of the Church of England (8vo), from doctor Maddox, bishop of St Asaph, to which Neal published a reply, entitled a Review of the principal Facts objected to, &c. His remaining volumes were reviewed by doctor Grey, to which an answer appeared in a new edition of Neal, 1797 (5 vols. 8vo), by doctor Toulmin. He died at Bath, in April, 1743, in the sixty-fifth year of his age, leaving a high character, both as a writer and a divine.

NEAPED; the situation of a ship which is left aground on the height of a spring tide, so that she cannot be flooded off till the return of the next spring.

NEAPOLITAN REVOLUTION. See *Naples, Revolution of.*

NEAP TIDES are those which happen when the moon is nearly at the second and fourth quarters. The *neap* tides are low tides, in respect to their opposites, the *spring* tides.

NEARCHUS; one of the captains of Alexander the Great, who was employed by that conqueror in conducting his fleet from India by the ocean to the Persian gulf. This expedition proved so tedious and fatiguing, that the leader, on his return, was not recognised by his friends, until he had made himself known. His service was so much esteemed, that he was crowned with a garland by Alexander at Susa. Fragments of his relation are extant, and form a curious and valuable record. It may be found among the *Geographi Minores* by Hudson. Vincent also published these fragments, with dissertations and a commentary (London, 1797).

NEBUCHADNEZZAR, or NABUCHODONOSAR, a king of Babylon, who reigned from 606 to 563 B. C., was the son of Nabopolassar, by whom the kingdom of Babylon was restored to its independency of the Assyrian monarchy. Nebuchadnezzar, by his conquests, extended the Babylonian power to the western limits of Asia. He defeated the Egyptian Pharaoh Necho, at Carchemish, captured and destroyed Jerusalem, Tyre, and Sidon. According to the policy of Asiatic conquerors, who transplanted the conquered nations of a turbulent character, he removed to Babylon a great number of the Jews, whose residence there is called the *Babylonish captivity*. Babylon was indebted to him for its magnificence. The Scripture account of his becoming an ox, for seven years, is by some understood to mean that he was afflicted with the disease called *lycanthropy* (q. v.); by others, to be susceptible of an allegorical interpretation.

NEBULA. The name of *nebulæ* is given to certain little spots, resembling white clouds, which are seen in the starry heavens, and which, as observed through the telescope, present three kinds of appearances. These appearances are either that of single stars, enveloped in a nebulous veil, or of groups of little stars, or only of a glittering cloud. The last are the proper nebulæ, which astronomers consider as systems of fixed stars, of which there may be innumerable multitudes in infinite space. Herschel, who spent much time in observing them, and has described them in his Catalogue of One Thousand new Nebulæ (London, 1786, 4to), does not consider them all as groups of stars. At present, as many as two thousand are known. Bode's Introduction to a Knowledge of the Starry Heavens (in German, Berlin, 1823, 9th ed.) treats of them at length.

NECESSITY; the quality of that which cannot but be, or cannot be otherwise. It is conceived in three different relations: 1. logical necessity, which consists in the circumstance that something cannot be conceived different from what it is, because the contrary is contradictory or absurd. 2. Physical necessity is that necessity which arises from the laws of the material universe. The *necessary*, in this respect, is opposed to the *casual*. Every thing in the sensible world has but a conditional necessity: it is necessary from some cause, so that we are led back to the primitive cause, to the Supreme Being, who is said, therefore, to be the only absolutely necessary, independently existing Being, so that metaphysicians say, with him absolute necessity and liberty are one thing. This will be more easily understood, if we consider more closely the meaning of necessity. In its general application, it presupposes a cause, which forces the thing to be such as it is, while, in this case, its meaning lies in the non-existence of a cause, and the Supreme Being who exists and acts without a cause, must be supposed to exist and act from necessity. 3. Necessity as to the volition and action of man—moral necessity—the great question, whether liberty of volition and necessity can exist together, and if so, in what manner, is the most intricate point of ethics and philosophy in general, and has been treated of in all ages and in all modes, in reference to morals and religion. In fact, it involves the whole relation of man to God. The Catholic theologians distinguish several kinds of necessity as to the means of salvation: they say baptism is absolutely necessary, because, without it, whether the want of it is owing to the fault of the individual or not, no one can be saved, while a person who cannot possibly receive the eucharist would not be punished, though he would deserve damnation if he should refuse it where he could receive it.

NECHO; one of the Pharaohs. He is mentioned in the Scriptures as the conqueror of Josiah, who fell in the battle of Megiddo, in attempting to check the progress of the Egyptian forces against Assyria. A few years later, he is described as making war upon Nebuchadnezzar, and experiencing a complete defeat at Carchemish. The documents of Egyptian and profane history show him to have been Necho II., son and successor of Psammeticus. Herodotus describes him under the name of Necho (ii. 158, 159), and relates, though with some inaccuracies, his war in Judea. Champollion has read the name upon many statues.

NECKAR; a river of Germany, which rises in the Black Forest in Wurtemberg, near one of the sources of the Danube, and flows into the Rhine at Manheim, after a course of about 150 miles. It is navigable for small boats to the influx of the Enz. The Neckar wines are light, sound, and of an agreeable flavour.

NECKER, James, minister of finance to Louis XVI., was born in 1734, at Geneva, where his father was professor of German public law, and went to Paris to enter the banking-house of his uncle M. Vernet. His attention and intelligence gained him the confidence of M. Thélusson, with whom he formed a partnership in the banking business. In the course of twelve or fifteen years, he became one of the richest bankers. Advantageous contracts with the East India company, and speculations in the British funds, in anticipation of the peace of 1763, of which he had received early notice, greatly increased his fortune. The East India company, of which he was a member, having chosen him to manage their cause with the government, he published a work on the subject (1769), in which he enumerated the services rendered by them to the state in different emergencies. His adversaries were Morellet and Lacretelle, who, attacking exclusive privileges, and demanding free trade, had the popular side of the question. Necker, however, gained many adherents, and even his errors did not prevent justice being done to his talents. He now retired from business, and received the post of resident of the republic of Geneva at the French court, in which he became favourably known to the duke de Choiseul. Ambitious of literary distinction, he produced his *Eloge de Colbert*, which gained the prize of the French academy. His *Essai sur la Législation et le Commerce* *des Grains* (1775) attracted great attention, and was violently attacked by the Economists (see *Physiocratic System*), as it was in favour of some restrictions on the exportation of corn. In spite of an inflated and incorrect style, and a vagueness of thought, his writings pleased the mass of readers, on account of the popular manner in which he treated affairs of finance. He gained the marquis of Pezay, who carried on a secret correspondence with Louis XVI., to his views, and, through him, transmitted to the king a memorial, in which he drew an altogether too favourable picture of the resources of the state. This measure accelerated his elevation. Towards the end of 1776, he was joined with the controller-general Taboureau as director of the royal treasury, and, in eight months after, took Taboureau's place. Maurepas, who, notwithstanding his great age and apparent indifference, was fond of the exercise of power, favoured Necker's advancement, in the expectation of finding a submissive servant in a man whose birth and religion would create him enemies among the nobles and clergy. Necker assumed his post in a difficult moment. Malversation, under the preceding reign, had caused a great deficit, to which the American war made great additions. New taxes would have been unpopular, and Necker endeavoured to meet the exigency by loans and reforms But the partisans of Turgot, whom he had alienated by his sentiments relative to the corn trade, found fault with his innovations. Turgot himself took part in the controversy: Necker was accused of an excessive preference for the *caisse d'escomte:* the abolition of the office of receiver-general was blamed as an act of bad faith, calculated to place the king under the dictation of the financiers; that of the director of the treasury, as the revival of a project of Law, whose name awakened the worst recollections, &c. The plan of convoking provincial assemblies displeased the parliaments, which it threatened to reduce to mere judicial tribunals. Necker, however, found many defenders, particularly among men of letters. In 1781, he published his *Comte rendu au Roi*, relative to his administration: more than 200,000 copies of this pamphlet were circulated. He was not, however, admitted to the common deliberations of the ministers, and Maurepas, who was jealous of Necker's reputation, succeeded in frustrating his plans, although they were approved by the king. Necker then demanded the *entrée au conseil*, as it was called. Some objection being made on account of his religion, he threatened to resign his place, and was not a little astonished to receive permission to retire (May, 1781). He went to Switzerland, where he purchased the barony of Copet, and published his work *Administration des Finances* (3 vols.), of which 80,000 copies were sold in a few days. His enemies accused him of undermining the foundations of the monarchy, by exposing the secrets of government, and of exchanging the character of counsellor of his prince for that of a tribune, by appealing from the king to the people. The errors and prodigality of Calonne increased Necker's reputation: the latter returned to France, in 1787, wrote against Calonne, who had accused him of being the author of the deficit, and was exiled in consequence. But, in 1788, when the attacks upon the minister of finance, Brienne (see *Loménie de Brienne*), began to alarm the court, Necker was recalled as controller-general, and accepted the post on condition that he should not be obliged to transact business with the premier. His convictions led him to support the convocation of the states-general, which was the wish of the nation. His report (of Dec. 27, 1788) on this subject may be considered the spark which kindled the pile. He was also in favour of the double representation of the third estate (see *France*), but neglected to regulate the mode of deliberation and of voting. In 1789, his enemies accused him of having contributed to produce the famine, by the expression of unfounded fears. They maintained that, of thirty-nine millions of francs expended in the purchase of corn, twenty-eight millions had been replaced by its sale, and that of this sum he had given no account. He was even charged with having applied it to the furtherance of his own ambitious views. May 5, he delivered a long speech, on the opening of the states-general, and laid down a plan for the labours of that body, which he expected to yield at his will. When the government determined to take measures against the increasing troubles, Necker, who opposed the adoption of those measures, was dismissed, mainly through the influence of baron Breteuil, and ordered to leave the kingdom within twenty-four hours. No sooner was his removal known than all Paris was in a ferment. The storming of the Bastile followed, and the symptoms of popular violence became so alarming, that the king found himself compelled to recall the banished minister. Necker received the news of his recall at Basle, and determined to comply with it: his return to Paris resembled a triumphal procession. His first object was to restore tranquillity, and security of person and property. But, as minister of finance, he was obliged to propose measures which could not be acceptable to the populace. His moderate opinions, in regard to the administration of government, did not keep pace with the wishes of those who dictated to the people. Mirabeau, in particular, whose character rendered him more fit to rule the popular will, undermined Necker's influence. In the deliberations on the plan of a new constitution, he defended the royal *veto*, and opposed the abolition of titles of nobility: he also proposed the establishment of a national bank. When the national assembly made public the contents of the red book (the private list of the royal pensions and grants), Necker declared warmly against this measure, and defended the list. These opinions exposed him to the charge of being an aristocrat: his personal security was threatened, and his influence annihilated. His plan of a loan at four and a half per cent. failed. Under these circumstances, he wrote to the assembly, in September, 1790, requesting his dismissal. He offered to place in their hands the two million livres which he had advanced to government, together with his house and appurtenances, as a pledge of his integrity. His offer was received without any marks of regret, and he left Paris with the mortification of seeing his plans and brilliant prospects fail. His daughter, madame de Stael, has given the most favourable view of his character as a statesman in her *Considérations;* but Bailleul in his *Examen critique* of that work has demonstrated the feebleness of Necker's policy. He returned to Copet, amidst the insults of the people, and his chagrin was heightened by domestic calamities. After the loss of his wife (see *Necker, Susannah*), to whom he was much attached, he occupied himself in writing a defence of his administration, *Sur l'Administration de M. Necker par lui-même.* In his work *Réflexions adressées à la Nation*, he defended the king. His essay *Du Pouvoir exécutif dans les grands Etats* (2 vols. 1792) is approved even by those who are not favourably disposed towards him. His *De la Révolution Française* (1796, 4 vols.) is a work of much interest; and his *Cours de Morale religieuse* (1800, 3 vols.), and *De l'Importance des Opinions religieuses* (1788), are not destitute of eloquence. He died at Geneva, in 1804.

NECKER, SUSANNA, wife of the minister, daughter of a clergyman of the canton of Berne, by the name of Curchod, received an excellent education, and, in her youth, was the object of the attachment of Gibbon. Having accompanied madame de Vermenoux to Paris, as Latin instructress of her son, Miss Curchod there became acquainted with Necker, to whom she was married in 1765. Madame Necker was of a most excellent character, and, under all circumstances, a tender, affectionate, and faithful wife, mother, and friend. Her heart was not less carefully cultivated than her mind; and on her husband's elevation, she made use of his influence and fortune only for purposes of benevolence and kindness. She erected an hospital, in the neighbourhood of Paris, at her own expense, and devoted to it her personal care. She had many friends among the men of letters, particularly Thomas, Buffon, and Marmontel, who has given an accurate account of her. She died in 1794. Madame Necker is the author of several works—*Des Inhumations précipitées* (1790); *Mémoire sur l'Etablissement des Hospices*, and *Réflexions sur le Divorce*. After her death, appeared *Mélanges*, (1798), and *Nouveaux Mélanges* (1801).

NECROLOGY (from νεκρος, dead, and λογος, word, &c.) signifies, in monasteries and cathedrals, the records of those bishops, canons, and others, who have made grants to the church, &c. Each one's record is read on the anniversary of his death, with prayers for him. Formerly, also, what is now called *martyrology* was called *necrology*. The biographical notice of a deceased person is likewise called *necrology*.

NECROMANCY (from νεκρομαντεια, or νεκυομαντεια); the divination of the future, by questioning the dead. (See *Divination*.) This, like many superstitious rites, originated in the east, or the extreme north, and is of the highest antiquity. Some have, indeed, maintained that it was not brought from Egypt or Persia to Greece, but originated in the last country; but it is difficult to prove this. We find mention made of necromancy in the Old Testament; for instance, in the first book of Samuel (i. 18), and in Deuteronomy (xviii. 11), where it is forbidden. In the eleventh book of the Odyssey, Homer has made Ulysses raise the shade of Tiresias from the infernal regions. The rite, as there described, contains nothing magical, and consists merely in the performance of a sacrifice with peculiar solemnities. This description of Homer proves that necromancy was common in Greece before his time. In many parts of Greece, there were oracles of the dead, the origin of which is lost in the obscurity of history. The fable of the descent of Orpheus to Hades is, by some, considered to refer to this species of necromancy. Indeed, it is very doubtful whether the expression used of many of the Greek heroes, that they descended to the infernal regions, means any thing more than that they consulted an oracle of the dead. While, in the rest of Greece, necromancy was practised in the temples by priests, or other religious persons, individuals called ψυχαγωγοι (evokers of spirits) practised it in Thessaly, the native country of magic, and made use of magical practices. In later times, these practices became horrible, for magicians, ascribing a superior power to human blood, and every thing which came from the gibbet or the grave, were led to the most revolting and disgusting acts. They tore men, half burned, from their funeral piles, buried others living, ripped out unborn babes from the wombs of their mothers, and committed other similar enormities. They frequently butchered men, in order to consult their spirits before they had time to hasten down to the regions of the dead. In case the invoked spirits (and this was the ancient and usual custom) actually presented themselves to the exorcist, necromancy was also called σκιομαντεια, and ψυχομαντεια, that is, divination by shades (σκιαι), or departed souls (ψυχαι). After the total downfall of paganism, men were satisfied with a kind of necromancy by which they merely caused the voices of the dead to be heard from their graves.

NECROPOLIS (from νεκρος, dead, and πολις, city); the city of the dead. This name is given, in particular, to the ancient cemeteries, which, in the neighbourhood of some of the great cities, are very extensive, and filled with magnificent remains. It has also been given to some modern cemeteries, as at Glasgow, Liverpool, &c.

NECTAR, in the Grecian mythology; the drink of the gods, which seems never to have been given to mortals. A beverage, made of honey and sweet wine, was also called *nectar;* and a sweet wine of Scio, made of half-dried grapes, still bears the same name.

NECTARINE. This fruit seems to differ from the peach only in having a smooth skin, and it is even found occasionally growing upon the same tree. The tree, in its foliage, parts of fructification, wood, and growth, is entirely similar to the peach.

NECTARY, in botany; that part of the flower which yields the honey.

NEDSHED. See *Arabia*.

NEEDLE, MAGNETIC. See *Magnet*, *Magnetic Needle*, and *Compass*.

NEEDLE-STONE. See *Zeolite*.

NEEF, or NEEFS, PETER, the elder, an eminent artist, was born at Antwerp, in 1570. He painted the interiors of churches and temples with surprising neatness and delicacy. To avoid the monotony attendant upon such a style, he introduced a variety of objects; and, by a good management of the *chiaroscuro*, he gave a lively and animated effect to what, otherwise, would have been tame and uninteresting. As he was but an indifferent designer of figures, some of his pictures are decorated with those of Velvet Brueghel, Teniers, and others. He died in 1651.—His son *Peter*, the younger, painted similar subjects, but they are deficient both in neatness and correctness.

NEELE, HENRY; an ingenious English poet and novel-writer, who died, by his own hand, February 9, 1828, in a fit of insanity, supposed to have originated from too intense application to study. He was the son of an engraver, and was educated for the profession of a solicitor, which he practised, with reputation, in London, till his death. He was a man of amiable disposition, and highly respected by his acquaintance. Among his publications are Poems; Dramatic Scenes; and the Romance of History (3 vols. 12mo), a series of tales relating to persons and events mentioned in the English annals. His Literary Remains have been published since his death (1 vol. 1829).

NEER, ARNOLD VAN DER, an eminent artist, was born at Amsterdam, in 1619. He excelled in painting views in Holland, cottages, or fishermen's huts, and in his beautiful delineation of the effect of moonlight. He was a perfect master of the *chiaroscuro*. His sunsets are excellent; nor was he less successful in painting water pieces, in which he is only surpassed by Cuyp. He died in 1683.—His son *Eglon Hendrick Van der Neer* was born in 1643, and was an historical and portrait painter. His pictures of conversations and gallant subjects are most admired; they are well coloured and highly finished. He was employed, for some time, by the elector palatine at Dusseldorf, where he died in 1703.

NEERWINDEN; a village in the province of Brabant, kingdom of Belgium, sixteen miles from Louvain. In 1693, the marshal of Luxembourg gained a victory here over the allies under William III., king of Britain. In 1793, the French, under Dumouriez, were defeated here by the Austrians.

NEGATIVE (from the Latin *negare*, to deny; hence a *negative* answer is a *denying* answer). In philosophy, every thing is called *negative* which, without determining any thing itself, only excludes something else (the *positive*). Thus, for instance, *man*, *black*, *wise*, are positive ideas; they mean something direct, and it is not necessary to arrive at their meaning by the intermediate process of excluding something else. While, if we say a thing is *not a man*, *not black*, *not wise*, nothing is determined. A thing which is "not a man" may be a book, air, water. Hence we see that the *negative* notion always requires something *positive*, which it excludes, or *negatives*. It is necessary, however, to remark here, that in all languages, certain words which expressed, originally, negative notions, having received a positive meaning, as no one thinks of them any longer as merely excluding ideas of a positive character. For instance, *innocent*, *illegible*, *fearless*—these words are, in their meaning, as positive as the terms *pure-hearted*, *badly-written*, *brave*. Every term may be considered as negative, in reference to notions other than those which it conveys, since it excludes them.

Negative and *positive quantities*, in mathematics, are such as are, respectively, greater or less than nothing. Thus, if we call a man's debts, when they much exceed his property, *positive*, we must call his property *negative*; or, if we call the former *negative*, we call the latter *positive*. If we suppose one of the legs of an angle movable round the vertex, we may represent all possible angles, and on both sides of the immovable leg; those on one side are *positive*, those on the other *negative*. The same relation exists, in mechanics, between power and weight; in statics, between pressure and resistance, &c. The higher arithmetic extends the application of the fundamental rules to the negative and positive quantities; which application forms the basis of algebra. Negative quantities are designated by —, and positive ones by +, so that $-4+4=0$.

NEGATIVE PREGNANT, in law, is a negative which implies, or brings forth, an affirmative.

NEGRO (Latin *niger*, black); a race or variety of the human species deriving their name from one of their most striking characteristics, their black colour; called, also, the *Ethiopic race*. (See *Man*.) Their native region seems to be the central portion of Africa, though some tribes of the negro variety have been found in America and the South Sea islands. The negro formation prevails in Western Africa in the region of the Gambia and Senegal; extending southwards, it is most strongly marked in Guinea, and passes gradually over into the Caffre and Hottentot formation. In Eastern Africa, it commences to the south of Abyssinia; prevails in Zanguebar and Monomotapa, though not in general pure. Of the tribes in the more central part of Africa little is known. (See *Nigritia*.) The heat of the climate, in all these regions may have some effect upon the tint of the skin, but is by no means the only or the principal cause of the black colour, since, under the same climates of the torrid zone, there are found all shades of complexion. White men in Africa only become somewhat swarthier, but never black, even in a succession of generations, unless they intermingle with the negroes; and blacks, in other regions and climates, are not found to lose their native hue. The seat of the black colour is the *rete mucosum*, and the external surface of the true skin (*cutis*); and when the *rete mucosum* is destroyed, as by disease, &c. (see *Albinos*), the colour is lost: so, in parts of the body where the epidermis is unusually thick (the palms of the hand and the soles of the feet), it is of a lighter shade. Negroes are also distinguished from the other races by other external, and by some anatomical peculiarities, particularly in the conformation of the cranium. The projection of the whole visage in advance of the forehead; the prolongation of the upper and lower jaws; the small facial angle (see *Face*); the flatness of the forehead, and of the hinder part of the head (*occiput*), and the compression in the direction of the temples, allowing less space for the brain than in some other varieties; the woolly, frizzled hair; the short, broad, and flat nose; the thick, projecting lips, with many other peculiarities of formation, constitute some of the characteristics of the negro or Ethiopic race. The African tribes of this variety have, in general, elevated themselves so far above the simple state of nature, as to have reduced the lower animals to subjection, constructed settled habitations, practised a rude agriculture, and manufactured some articles of clothing or ornament. In political institutions they have made no advance, their governments being simple despotisms, without any regular organization. Their religion is merely the instinctive expression of the religious feeling, in its lowest form of fetichism. (See *Fetich*.) Their languages are described as extremely rude and imperfect; almost destitute of construction, and incapable of expressing abstractions. They have no art of conveying thoughts or events by writing, not even by the simplest symbolical characters. The negro character, if inferior in intellectual vigour, is marked by a warmth of social affections, and a kindness and tenderness of feeling, which even the atrocities of foreign oppression have not been able to stifle. All travellers concur in describing the negro as mild, amiable, simple, hospitable, unsuspecting, and faithful. They are passionately fond of music, and they express their hopes and fears in extemporary effusions of song. The opinion formerly maintained, that they were of an inferior variety of animals, would not now find an advocate, or a convert, even in the ignorance or the worst passions of the whites. Whether they are capable of reaching to the same height of intellectual cultivation as the Europeans, is a question which we need more facts to decide. (See *Civilization*.) The most eloquent defender of the negroes is the abbé Grégoire, in his work *De la Littérature des Nègres, ou Recherches sur leurs Facultés intellectuelles, leurs Qualités morales*, &c. See the articles *Africa*, *Physiology*, *Philology*, *Slavery*, &c.

NEGROPONT, or **EGRIPO** (the ancient *Eubœa*); an island in the Archipelago, separated from the continent by the narrow strait formerly called *Euripus*, over which there is a bridge 200 feet long. The modern name seems to be a corruption of *Egripos*, the name of the capital (the ancient *Chalcis*), which is probably derived from that of the strait on which it lies. The superficial area is 1610 square miles; the population, previous to the Greek revolution, amounted to 60,000, among whom were 40,000 Greeks. Its soil is fertile, yielding corn and various fruits in abundance; wine, oil, honey, and silk are also produced. The mountains in the interior are lofty, and their summits are covered with snow during six months in the year. The capital is Egripos, or Negropont. The castle of Carysto, on the southern extremity of the island, over against Athens, by its position at the entrance of the straits, commands the whole island, and also the province of Attica. In 1821, Eubœa raised the standard of revolt, at the call of the beautiful Modena Maurogenia, a young lady descended from a princely family of the island, and whose father had been strangled by the Porte. She fitted out two ships from Myconi, with a supply of arms for the inhabitants of the island, and offered her hand, as the reward, to any free Greek who should conquer the Turks. Seventy-two villages were soon in arms, upon which the Turks retired into Egripos and Carysto, which were closely blockaded by the Greeks.

NEGUS; a drink, made of wine, water, sugar, nutmeg, and lemon-juice; so called from colonel Negus, the inventor.

NEHEMIAH; a distinguished and pious Jew, who was born in captivity, but was made the cupbearer of Artaxerxes Longimanus. He used his influence for the welfare of his unhappy countrymen, and became their benefactor. At his own request, he was sent, as governor, to Jerusalem, with a commission to rebuild the walls and gates of this city. He accomplished his purpose, but not without difficulties, arising partly from the poverty of the lower classes of the people, and partly from the opposition of the Moabites and Ammonites. He then took measures to raise the city to its former splendour, and to increase its population. He and Ezra were the proper founders of the Jewish liturgy, and a collection of the holy books was made under their inspection. Nehemiah published an account of the same in a book which is admitted into the Jewish canon, and is supposed to be a continuation of the narration contained in the book of Ezra. It includes a period of forty-nine years.

NEITH, or NEITHA; one of the later goddesses of the Egyptians, whose worship flourished at Sais, in Lower Egypt, and who was considered as its founder and protectress. Plato calls her, in Timæus, the *Athena of the Greeks*. A colony from Sais is said to have brought the worship of Neith to Athens. She appears, in later times, to have become identified with Isis. The splendid temple at Sais, which was illuminated on her yearly festival, bore this sublime inscription:—"I am all that has been, that is, and that will be; and no man hath ever lifted my veil. The sun was my child." See *Hieroglyphics*, division *Egyptian Mythology*.

NELSON, Horatio; a celebrated naval officer, who was born, September 29, 1758, at Burnham Thorpe, in Norfolk, of which parish his father was rector. At the age of twelve, he entered the navy, as a midshipman, and, in 1773, accompanied commodore Phipps (see *Mulgrave*) in an expedition towards the north pole. In 1777, he was made a lieutenant, and, in 1779, raised to the rank of post-captain. He distinguished himself in an attack on fort Juan, in the gulf of Mexico, and on other occasions, and remained on the American station till the conclusion of peace. He afterwards commanded the Boreas frigate, and was employed to protect the trade of the Leeward islands. On the commencement of the war with the French republic, he was made commander of the Agamemnon, of sixty-four guns, with which he joined lord Hood in the Mediterranean, and assisted at the taking of Toulon, and at the siege of Bastia. At the siege of Calvi, he lost an eye. In the battle off cape St Vincent, February 13, 1797, he commanded the Captain, on board of which he attacked the Santissima Trinidada, of 136 guns; and, passing to the San Nicholas, of eighty guns, and the San Joseph, of 112, he obliged both those ships to strike their flags. For his gallantry, he was made a knight of the Bath, rear-admiral of the blue, and appointed to the command of the inner squadron at the blockade of Cadiz. His next service was an attack on the town of Santa Cruz, in the island of Teneriffe, in which he was unsuccessful; and, being severely wounded, his life was saved by his son-in-law, captain Nesbit, who, at great personal hazard, conveyed him to a boat. He was obliged to suffer the amputation of his right arm, in consequence of which he obtained a pension of 1000 pounds. In 1798, he joined lord St Vincent (admiral Jervis), who sent him to the Mediterranean to watch the progress of the armament at Toulon. Notwithstanding his vigilance, the French fleet, which conveyed Bonaparte to Egypt, escaped. Thither Nelson followed, and, after various disappointments, he discovered the enemy's fleet moored in the bay of Aboukir. Having, by a well executed manœuvre, obliged them to come to action, he obtained a most complete victory, all the French ships but two being taken or destroyed. This achievement was rewarded with the title of *baron Nelson of the Nile*, and a pension of 2000 pounds, besides the honours conferred on him by the grand seignior. His next service was the restoration of the king of Naples, which was accompanied with circumstances of revolting cruelty, which may be attributed to the influence of lady Hamilton (q. v.), the wife of the English ambassador. His connexion with that lady, with whom he lived publicly after the death of her husband, occasioned his separation from lady Nelson, on his return to England. In 1801, he was employed on the expedition to Copenhagen, under Sir Hyde Parker, in which he displayed his accustomed gallantry, and effected the destruction of the Danish ships and batteries. On his return home, he was created a viscount, and his honours were made hereditary in his family, even in the female line. When hostilities recommenced after the peace of Amiens, lord Nelson was appointed to command the fleet in the Mediterranean; and for nearly two years he was engaged in the blockade of Toulon. In spite of his vigilance, the French fleet got out of port, March 30, 1805, and, being joined by a Spanish squadron from Cadiz, sailed to the West Indies. The British admiral hastily pursued them, and they returned to Europe, and took shelter at Cadiz. On the 19th of October, the French, commanded by Villeneuve, and the Spaniards, by Gravina, ventured again from Cadiz; and, on the 21st, they came up with the British squadron off cape Trafalgar. An engagement took place, in which the victory was obtained by the British, at the expense of the life of their commander, who was wounded in the back by a musket ball, and, shortly after, expired. His remains were carried to England; and, after lying in state at Greenwich, he was magnificently interred in St Paul's cathedral, where a monument was erected to his memory. Having left no issue by his wife, an earldom was bestowed on his brother, and a sum of money voted by parliament for the purchase of an estate, which is to descend, with the title, to his collateral relatives. His life has been written by Mr M'Arthur, doctor J. Stanier Clarke, and doctor Southey. For an account of the battle of Trafalgar, see *Navy*.

NELSON, Robert; an English gentleman of fortune, which he employed in works of benevolence and charity, and, from this circumstance, as well as from the devotional works of which he was the author, is generally distinguished by the epithet of the *pious*. He was the son of a London merchant engaged in the Levant trade, and was born in London, 1656. Having gone through the customary course of study, he proceeded to make a continental tour, in company with his friend Edmund Halley. On the accession of William, he remained a nonjuror, associating and communicating principally with the recusant clergy. These opinions did not, however, interrupt his intimacy with archbishop Tillotson, whom he assisted in every work which had the good of mankind for its object, till the death of the worthy prelate, who expired in his arms, in 1694. In 1709, the arguments of some of his clerical friends had produced such a degree of conviction upon his mind, that he became a member of the established church, and continued in that communion till his death, which took place at Kensington, January 16, 1715. There are few writers on devotional subjects whose works have been so popular as Mr Nelson's. His treatise entitled a Companion to the Festivals and Fasts, especially, has gone through a great number of editions. Among his other works are the Whole Duty of a Christian; the Duty of frequenting the Christian Sacrifice (8vo); an Address on the Means of Doing Good; a Letter on the Trinity; the Practice of True Devotion (12mo); Transubstantiation contrary to Scripture (4to); a Letter on Church Government; a life of his old tutor, bishop Bull, &c.

NELSON'S RIVER, in the British possessions in North America, flows from lake Winnipeg into Hudson's bay; lon. 92° 466' W.; lat. 57° 2' N. A part of the river is called the *Saskashawan*. Its whole length is about 1450 miles.

NEMÆAN GAMES, so called from the small town of Argolis, where they were celebrated (Nemæa, in the Peloponnesus), originated, according to tradition, in the funeral games which were established in honour of Opheltes (see *Hypsipyle*), who was killed in his youth by a dragon. The heroes who went to Thebes called him *Archemorus* (the beginning of sorrow). He was the son of Lycurgus and Eurydice. Funeral games at the graves of distinguished men or favourite individuals, were very common in ancient times. Those of Opheltes, according to tradition, had this peculiarity, that they were renewed every three years. Another account relates, that the Nemæan games were established by Hercules, in honour of Jupiter, after he had destroyed the Nemæan lion, whose den was about fifteen stadia from Nemæa. A third account combines these two reports; stating that these games originated in the funeral games of Archemorus, but were renewed by Hercules, in honour of Jupiter. The plain of Nemæa is now inhabited by a single shepherd. Three Doric columns of the temple of Jupiter stand in the centre, with ruins scattered around. The Nemæan games were less solemn than the Olympic and Pythian. Sometimes, though not very often, time was divided by Nemæads (in the same manner as it was commonly divided by Olympiads and Pythiads). The Chronicon of Eusebius gives the second year of the fifty-third Olympiad as the first of the Nemæads. The Nemæan games were partly gymnastic (corporeal), and partly musical (intellectual), and resembled, in their regulations, the famous Olympic games. (q. v.) The judges of the combats (*agonothetæ*) were chosen from Argos, Sicyon, and Corinth, and wore, in commemoration of the origin of the celebration, black mourning garments. They were distinguished for their impartiality. Originally, the reward of the victor was a wreath of olive-branch; afterwards, of green ivy. See *Pindar*.

NEMÆAN LION. See *Hercules*, and *Nemæan Games*.

NEM. CON.; the contraction of *nemine contradicente*, which signifies, "no one opposing," or "unanimously."

NEMESIS, in the Greek mythology; according to some, the daughter of Erebus and Night; according to others, of Night alone: other accounts make her the daughter of Δικη (Justice), or of Jupiter and Necessity, or of Ocean and Night. She is the goddess of retribution, the tamer of the passions, the avenger, the enemy of pride and haughtiness; and she watches over the observance of the honours due to the dead; on which account a yearly festival, in memory of the departed, was called, by the Greeks, *Nemesia*. Nemesis is represented under the figure of a majestic female, clothed in a tunic, with a *peplum* thrown over her, and a crown (which is sometimes surrounded by stags and a Victory) on her head. With the right hand she grasps a part of her garments over her breast, and thus forms the ell measure; in her left hand she holds a cup, or a bridle, &c. On coins, she appears drawn in a car by dragons, sometimes wearing a mural crown, and rarely winged. The great number of coins and gems on which she is found, proves her worship to have been extensive and popular. She is also called *Adrastea*, from *Adrastos*, who, according to tradition, erected the first temple to her in Adrastea, or in Cyzicus; and *Rhamnusia*, from a small village of Attica, two miles from Marathon, where stood a statue of her, made by Phidias, from the marble brought thither by the Persians, for the purpose of erecting a trophy of their expected victory. She is sometimes considered the same as Leda.

NEMOURS; a French town, in the department of Seine-et-Marne, three and a half leagues south of Fontainebleau. It has 4150 inhabitants. It originated with a castle called *Nemus*. Louis XIV. gave the duchy of Nemours to his brother Philip of Orleans; and the house of Orleans retained it until the revolution. The second son and fourth child of the present king of the French, Louis Charles Philip Rafael, bears the title of duke of Nemours, which was his title before his father ascended the throne. He was born October 25, 1814. February 3, 1831, he was elected, by the Belgic national congress, king of the Belgians; but his father declined the offered crown, in a formal audience, February 17, to avoid disturbing the peace of Europe. Lafitte was then prime minister.

NENNIUS, an ancient British historian, abbot of Bangor, is generally said to have flourished about the year 620, and to have taken refuge at Chester at the time of the massacre of the monks of that monastery. Bishop Nicolson, however, contends, that from his own book, it is evident that he did not exist before the ninth century. He composed several works, of which catalogues are given by Bale and Pitts; but the only one remaining is his *Historia Britonum*, or *Eulogium Britanniæ*, which is published in Gale's *Hist. Brit. Scrip.* (Oxon. 1691).

NEOCASTRO. See *Navarino*.

NEOLOGISM (from the Greek νεος, new, and λογος, a word); a new word or phrase, or new use of a word; in fact, every innovation in a language, after it has had a classical epoch. The difficulty of prescribing a just medium in regard to the introduction of new words and phrases, is easily seen, because as long as a language is spoken, it must change and develope itself; and the greatest power on earth would be unable to retain it unchanged. On the other hand, a language is exposed to the greatest corruption if it is left open to all the neologisms of careless writers. Great genius generally gives currency to a neologism. In the last century, the orthodox in Germany called their opponents *neologists*, and their doctrines *neology*.

NEOPHYTE (from νεος, new, and φυτον, plant); in the Eleusinian and other mysteries, a person newly initiated; among the early Christians, a new convert from paganism; in the monasteries, a novice.

NEORAMA; an invention of Allaux, a Frenchman, for representing the interior of a large building, in which the spectator appears to be placed. Every thing is exhibited to the life by means of groups and shading. The first neorama was exhibited at Paris, in 1827, and represented the interior of St Peter's church in Rome, with the doors open, and a distant prospect. See *Panorama*.

NEPAUL; a mountainous country in the northern part of Hindostan, lying between lat. 26° 20′ and 30° 20′ N., and lon. 80 and 88° E., having Thibet, from which the Himala mountains separate it, on the north, and the British province of Bengal and Oude on the south; square miles, about 53,000; population, 3,500,000. It first became well known by the war between the British and the rajah in 1815. General Ochterlony advanced with such rapidity, that, February 28, he appeared before Muckwampore, the principal fortress of the Nepaulese. The rajah attempted, on the 29th, to recover the heights, which had been previously lost, but was driven back; and on the next day the British took fort Hurlapore, the bulwark of Muckwampore, by storm. By this rapid advance, general Ochterlony terminated the campaign, the issue of which had appeared doubtful on account of the sickness prevailing among the British troops, and compelled the rajah, Mahara Sah Bicra ma Sah, to accede (May 4, 1816) to the terms of peace before assented to by his brother. By the articles, the chain of forts on the southern frontier, together with several districts, was ceded to the East India company, and the passage through Nepaul to China was declared free to the company. The rajah also agreed not to receive any Europeans or Americans into his service. The rajah of Nepaul still possesses Goorca, the land of his ancestors, who first acquired Nepaul in 1768. The country is from 3000 to 6000 feet above the sea, and lies between two parallel ranges of mountains, one on the north, the other on the south; and it can be entered only through mountain passes. Three or four days are employed in ascending the range on the southern frontier from Behar. On arriving at the highest pass, the valley of Nepaul is spread out before the eye of the traveller. The soil is fruitful and well watered, the air pure, the climate healthy, and in summer, when the sun is reflected from the high mountains, very hot. In winter there is little ice; the north wind never blows in these valleys. The seasons are the same as in Upper Hindostan, only the rains set in earlier. The productions are honey, rice, oil, cotton, ginger, iron, marble, &c. The inhabitants are chiefly Hindoos and Newars. The latter are probably of Mongolian and Chinese origin. Besides these two nations, there are other little known tribes. The inhabitants are distinguished for the simplicity of their character and manners; the Newars are mostly artisans. The religion of the Nepaulese differs little from that of the Hindoos in Bengal. The custom for widows to burn themselves on the corpses of their husbands, prevails among them. The Hindoo languages are the Nepaulese, and the Nogari, which is said to be older than the Sanscrit. Cotton manufactures, and the working of iron and copper, are the principal employments. The people make paper from the bark of trees and plants, and distil brandy from rice and wine. The government is despotic, but more moderate than in other countries of Asia. The regular army consists of about 12,000 men, part of whom are armed with muskets. The capital is Catmandoo, with 20,000 inhabitants. See Hamilton's *Account of the Kingdom of Nepaul* (Edinburgh, 1819.)

NEPENTHE; a drink which was fabled, by the poets, to banish the remembrance of grief, and to cheer the soul. The invention was attributed to the Egyptians. According to Homer (*Od.* iv. 220), Helen learned the art of preparing it from the queen of Egypt.

NEPENTHES, or PITCHER PLANT; a singular and celebrated genus of plants, containing three known species, which inhabit Madagascar, the East Indies, and the neighbouring parts of the continent of Asia. The flowers are diœcious; the stem is cylindrical and simple; the leaves are alternate, entire, and sheathing at base; they are strongly nerved, and the median nerve, which is larger than the rest, is prolonged beyond the leaf in the manner of a tendril, and terminates in a cylindrical urn. This urn is three or four inches in length by nearly one in diameter, and its orifice is covered with an orbicular lid, which opens and closes at certain periods. It is usually filled with sweet and limpid water, at which time the lid is closed. In the course of the day, the lid opens, when more than half the water is evaporated; but this loss is made up during the night, and in the morning it is again found full, with the lid closed. The culture of these plants in green-houses is very difficult.

NEPHELE. See *Athamas*.

NEPHRITE, or JADE, a mineral never observed except in the massive state, and possessed of an impalpable composition, or compact texture. Its fracture is coarse, splintery, and, in some varieties, slaty; colour green, particularly leek-green, passing into gray and white, rarely with a tinge of blue or red; translucent; hardness approaching that of quartz; specific gravity, 2·932; fracture effected with great difficulty; alone before the blow-pipe, infusible, but becomes white. It consists, according to Kastner, of silex, 50·50, magnesia, 31, alumina, 10, oxide of iron, 5·50, oxide of chrome, 0·05, and water, 2·75. Other varieties of the jade are softer, and differ considerably in their chemical composition. The apple-green variety, tinged with blue, from Smithfield, Rhode Island, consists, according to Bowen, of silex, 44·68, magnesia, 34·631, water, 13·41, lime, 4·25, and oxide of iron, 1·747. Jade has been brought from China and Egypt. In America, it has been found on the banks of the Amazon. In New Zealand and other islands of the Pacific, it is often made into hatchets, and has hence been called *axe-stone*. In Rhode Island, it occurs imbedded in white limestone, in irregular veins and nodular masses. The pieces from this place, when polished, have considerable beauty.

NEPHTHYS; an Egyptian deity, sister of Osiris and Isis, wife of Typhon, and mother of Anubis by Osiris. According to Diodorus, she was the daughter of Ζευς (Jupiter) and 'Ηρη (Juno). She was also called by the Greek writers Τελευτη (End), Αφροδιτη and Νικη (Victory.) Some consider her as the symbol of the Egyptian coast on the Mediterranean; others as the personification of the five intercalary days of the Egyptian year, in which point of view they are called her children by Mercury, the Sun, and Saturn. Plutarch names them *Osiris*, *Arueris*, *Typhon*, *Isis*, *Nephthys*; Diodorus calls them *Osiris*, *Isis*, *Typhon*, *Apollo*, and *Aphrodite* (Venus). See *Egyptian Mythology*, and of article *Hieroglyphics*.

NEPISSING; a lake in Upper Canada, about thirty-five miles long and twenty broad. It is twenty-five miles north-east of lake Huron; lat. 46° 12′ N.

NEPOMUK, JOHN OF (*Johannes Nepomucenus*); the patron saint of Bohemia. His true name was John Welflin, and he was born in 1320, at Pomuk, a small town in Bohemia. He studied in Prague, and became a preacher there. From humility he refused a bishopric. At a later period, he was made confessor of the queen, and when some courtiers made the king Wenceslaus suspicious of the fidelity of his wife, he refused to disclose the secrets of her confession, for which the king had him drowned, May 16, 1383 (according to others, March 21), in the Moldau. His day was at first May 6, because his body was then found; at present, it is May 10. He is much revered in Bohemia as a martyr, and his protection is invoked against slander, &c. Pope Innocent XIII. recognized him as a saint in 1721, and Benedict XIII. canonized him in 1729. The Jesuit Balbin has given his biography in his *Miscell. Hist. Boh.* It has been asserted of late that no such person as Nepomuk ever lived, but that there was a John of

Pomuk, who was archbishop of Prague in 1393. Yet the marble sepulchre of Nepomuk is shown in the cathedral at Prague. According to others, again, he was thrown into the river because he refused to renounce the authority of the archbishop, whose vicar he was, and who had excommunicated the chamberlain of the king, and preached against the vicious life of the king himself.

NEPOS. See *Cornelius Nepos.*

NEPOTISM; a word used in the languages of the European continent to signify, originally, the undue patronage bestowed by the popes upon the members of their family (*nepotes*) by appointing them to high offices in the church, or making them important grants. It was not uncommon for a person elected pope, to elevate his whole family, so that ever after the family belonged to the richest nobility in Rome. The term has been used also in a more general sense, to denote any patronage bestowed in consideration of family relationship, and not of merit.

NEPTUNE appears to have been originally known to the Romans merely as the god of horses, and as such to have been confounded with the ancient Italian god Consus. When the Roman state became a naval power, and the Greek mythology was introduced into Rome, attributes of the Grecian Poseidon, or Poseidaon, were transferred to the Roman Neptune, who therefore came to be considered the same god under different names. Neptune was the son of Saturn and Rhea or Ops, and brother of Jupiter (q. v.) and Pluto. Different accounts are given of the manner in which his mother saved him from the fate to which he was doomed by his father. (See *Saturn.*) According to some, he was thrown up again after having been swallowed by his father; according to others, Rhea gave her husband a foal instead of the infant, and the latter was secretly educated in Bœotia. After the successful rebellion of his brother Jupiter, Neptune received the dominion of the sea (*Pontos* or the inland sea, and not the ocean) as his share of the spoils. It is not easy to determine the true meaning of the mythus which describes him as having produced the horse in a contest with Minerva (q. v.) for the possession of Attica. It may imply that the use of the horse was first introduced into Greece at the same time with the worship of the Phœnician god Poseidon, by Phœnician pirates, or it may be connected with some symbolical idea. He raises, calms, and shakes the sea, and even makes the earth, with its mountains and woods, tremble. He was particularly worshipped in islands and on the sea-coast. The Isthmian games (q. v.) were celebrated in honour of him. Beside dolphins and other marine animals, the horse, and sometimes the owl, were sacred to him. In the earliest monuments of art, he is represented naked: in his hand he holds the trident, which the Mediterranean people early used as a harpoon, and as a mark of possession on any coast. He rides over the surface of the sea in a chariot drawn by two horses, accompanied by Nereids and sea-monsters. By his wife Amphitrite, he had two children, Triton and Rhode. The traditions concerning his other children, by various mothers, are by some explained as symbolical of the carrying off of women by pirates. Strength, courage, heroic deeds at sea, also obtained for men the appellation of *sons of Neptune.* The epithets applied to Neptune by the poets, refer chiefly to the sea, to navigation, to the creation of the horse, and also to his power of shaking the earth. Having taken part in the unsuccessful attempt of the gods to rise against Jupiter, he was condemned, together with Apollo, to serve Laomedon, king of Troy. Neptune built the walls of the city for Laomedon, but, being refused the pay promised him, caused an inundation, and sent a terrible sea-monster to infest the country. In the war of Troy, he was on the side of the Greeks, and in the battle of the gods, he encountered Apollo.

NEPTUNIANS, or NEPTUNISTS, are those who maintain the opinion, that the form of the earth and the revolutions which it has undergone have been produced entirely by the action of water. See *Geology,* and *Vulcanists.*

NEREIDS; sea nymphs, daughters of Nereus. They were fifty in number, and they had, like their father, the gift of prophecy and the power of assuming different shapes.

NEREUS; an interior divinity of the sea, sometimes also the sea itself, when it is calm. He was the oldest son of Pontus (the Sea) and Terra (the Earth). The poets represented him as a faithful, benevolent old man, the friend of justice and moderation, and the enemy of oppression. He possessed the gift of divination in a greater degree than all the gods of the three elements,—air, earth, and water,—and like other gods of the sea, could convert himself into all shapes. By Doris, the daughter of Oceanus, his spouse, and other goddesses, he was the father of the Nereids. His chief place of residence was the Ægean sea. When Paris sailed through this sea with Helen, whom he was carrying off, Nereus, according to the beautiful ode of Horace, warned him of the destruction of Troy. In the ancient works of art, and also by the ancient poets, he is represented as a malicious old man, with a wreath of sedge, sitting upon the waves, with a sceptre in his hand.

NERI. See *Guelfs.*

NERI, ANTHONY, deserves to be mentioned as one of the first chemists, at a time when the natural sciences were called *occult.* He was born in Florence about the middle of the sixteenth century. Though he had received holy orders, he always refused any benefice, in order to live solely for his science. He travelled through most countries of Europe, and wherever he was unable to study chemistry with distinguished men in any other way, he worked with them as an assistant in their laboratories. But his active life came prematurely to a close. There is only one treatise by him extant, on glass—*L'Arte Vetraria distinta in libri sette; ne' quali si scoprono maravigliosi effetti e s'insegnano segreti bellissimi del vetro nel fuoco, ed altre cose curiose* (Florence, Giunti, 1612, 4to), a work which has been translated into German, French, Latin, English. The best translation is said to be that by Holbach, in French, with the notes of the German and English translations, and many additional ones. Though chemistry has made immense progress since the time of Neri, his work, nevertheless, deserves to be read. The colouring of glass, it is well known, was a great subject of attention at a certain period, and attained a perfection which, having lost, it has not since reached.

NERI, ST PHILIP, the founder of the congregation of the Oratory in Italy, was born in Florence in 1515, of a noble family. From early youth he distinguished himself by piety and application to study. A rich uncle, a merchant, intended to make him his sole heir; but Neri left him secretly, and went to Rome in 1533, where he became instructer in the house of a gentleman of Florence. At the age of twenty-three, he sold his books, and gave the price to the poor. He now devoted himself entirely to the sick and pilgrims. In 1548, he established the fraternity of the Holy Trinity, for the purpose of aiding strangers who came to Rome for devotional purposes, and soon after he founded the *hospice* for the reception of pilgrims, which has become one of the finest in Rome.* He did not receive orders until the year 1551, having considered himself until then unworthy of them. Soon after, he entered the community of St Jerome, and instructed children, and finally also young ecclesiastics, who were called *oratorians*,* because they placed themselves before the church to call the people to prayer. In 1564, Neri collected these disciples into a community, and gave them regular statutes, but imposed no vow, wishing that they should always remain united by the bonds of charity only. Gregory XIII. approved of this congregation in 1575, and gave them the church *Sta. Maria di Vallicella*. The congregation soon spread over Italy. Baronius, one of his most distinguished disciples, assisted him in his last sickness. He died May 26, 1595. His letters were published at Padua in 1751. He wrote several other works; also poems, to be found in vol. i. of *Rimi Oneste*. A number of the poems of his youth he ordered to be burned shortly before his death. His life was written by Ant. Gallonio, his disciple, and the eye-witness, as he says, of most of the extraordinary deeds he describes. His life is also to be found in vol. v. of the *Acta Sanctorum*. (q. v.) Baronius succeeded him as general of the society in 1593.

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* At the time of the jubilee in 1600, this establishment supported, during three days, upwards of 440,500 men and 25,000 women.

NERLI, Philip, a Florentine historian, was born in 1485, in Florence, of a patrician family, and early prepared himself, by various studies, for the duties to which his birth called him. Cosmo I. made him a senator. He died in 1556. He left in manuscript, *Commentarj de' fatti civili occorsi nella Citta di Firenze dall' Anno* 1215 *al* 1537, not printed until 1728, though the nephew of the author had presented it to Francis Medici II., requesting his opinion respecting the propriety of publishing it. Francis of Medici therefore seems to have preferred not to see it published. To appreciate a history, we must always know the character of the historian, particularly if he treats of times much agitated by party struggles, which affected him personally. Nerli, though not desirous of a monarchy, was, in his disposition, aristocratic. His ancestors had been consuls 300 years before him; women of his family are mentioned by Dante. His uncle had the first Homer printed. To himself, when young, Horace was dedicated, "because he allowed no day to pass without reading him." He formed himself in the gardens of the Rucellai, in the society of Macchiavelli, who dedicated a chapter to him. He says, in the preface of his work mentioned above, that his endeavour is to show why the citizens of the great republic have subjected it to one single house (the Medici). Some have reproached him as guilty of flattery; but Ranke, in his excellent work *Zur Kritik neuerer Geschichtschreiber* (Leipsic and Berlin, 1824), says, that he treats that branch of the Medici family, at least, which ruled to the death of Clement VII., without hatred indeed, but without partiality.

NERO, Lucius Domitius Ahenobarbus (after his adoption, called *Claudius Drusus*), the son of Caius Domitius Ahenobarbus and Agrippina, the daughter of Germanicus, was born at Antium, A. D. 37. When Agrippina afterwards married the emperor Claudius, he was adopted by him, and succeeded him in the government, A. D. 54. Augustus, the first Roman emperor of the family of the Cæsars, commenced his reign with cruelty, but ended with clemency. Nero, the last, began mildly, but ended cruelly. He was excellently educated. Burrhus instilled into his mind all the knowledge and principles necessary to the formation of a great general and statesman, while Seneca made him familiar with philosophy and elegant literature. The beginning of his reign even surpassed the expectations founded upon the union of his great talents with such an education. A sentence of death being presented to him for his signature, he expressed a wish that he had never learned to write. But the flattery and the seductions of his courtiers, particularly of his freedman Narcissus, soon brought to light a character which till this time had slumbered. At the age of seventeen years, Nero gave himself up to the greatest excesses of sensuality and cruelty. He first poisoned Britannicus, to whose prejudice he had ascended the throne by the assistance of Agrippina, and afterwards, fearing his mother's ambition, put her to death also. The ridiculous desire of being esteemed a great performer in music, ruled in his bosom superior to all other passions. He performed in public, and placed soldiers, as spies, to observe those who did not appear inclined to admire his voice or his execution. He wished also to be distinguished in the chariot race. He traversed all Greece with a retinue of artists, and, of course, won the first prizes in all the celebrated contests and games. Sensuality made him ingenious in gluttony and in the gratification of his natural propensities; extravagance made him covetous, and danger made him cruel. The most distinguished victims to his cruelty, besides Britannicus and Agrippina, were his instructers Burrhus and Seneca, the poet Lucan, and his wives Octavia (daughter of Claudius and Messalina, whom he divorced on pretext of barrenness, and then banished to the island of Pandaleria, where he soon after caused her to kill herself by opening her veins), and Poppæa Sabina. "My predecessors," said he, "did not know the rights of monarchy. People may hate me, if they only fear me." For the gratification of an insane caprice, he set fire to Rome, merely, as it is reported, that he might have a real representation of the conflagration of Troy. The most beautiful monuments of art and of history were burned to the ground in this fire, which lasted nine days. He transferred the guilt of this action to the Christians, and caused them to be cruelly persecuted for it throughout the empire. As his passion for building was very strong, he caused that part of the city which was burned to be rebuilt in a manner more splendid and magnificent than before. The most remarkable of his buildings was the palace which he erected for himself in Rome, and which was known under the name of the *golden house*. His extravagance in other things—clothes, hunting, furniture, &c.—was as boundless as his munificence to the people of Rome, whom he enriched by great largesses (*largitiones*, common in the republic only under certain circumstances), while the provinces were oppressed by the weight of taxes. Several conspiracies were formed against him in Rome, which ended in the destruction of the conspirators themselves. At last, the revolt of Galba, his governor in Spain, whose cause the senate also espoused, succeeded. The tyrant anticipated the punishment which awaited him, by committing suicide, A. D. 68. Although the manifestations of joy were great at his death, yet persons were not wanting who still admired, deified, and lamented him. They strewed his grave with flowers, and placed his statue near the rostrum. In short, his memory was so precious to a great part of the people, and the soldiers, whom he had endeared to him by liberality and indulgence, that many impostors succeeded, for a time, in passing themselves off for Nero. Nero was less inimical to ingenious raillery because possessed of much wit himself, notwithstanding he was the first Roman emperor who made use of speeches prepared by another. It is much to be lamented that that part of Tacitus which contains a particular description of the character and government of Nero, has not come down to us.

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* The followers of this saint are called, in Italy, also *Filippini*, Philippians, from their founder.

NERVA, the successor of Domitian, and one of the most virtuous of the Roman emperors. In early life, he held the consulship, and was a man of a cultivated mind, and not without poetical talent, but was advanced in age when he ascended the throne, A. D. 96. He, nevertheless, performed many beneficent acts, provided for the public tranquillity and the execution of justice, and relieved the poor. Notwithstanding this, there were many unfriendly to him, particularly the soldiers of the guard, and there was even a conspiracy formed against him. He died A. D. 98. Trajan was his successor.

NERVES. The nerves of the animal frame are composed of bundles of white parallel medullary threads. Every bundle is surrounded with a soft sheath full of blood-vessels, and whose finest branches terminate in the substance of the nerves. These nerves are spread through the whole animal frame, and variously connected with each other. Only the epidermis, the hair, and nails are destitute of them. They are of various size, according as they are composed of more or fewer bundles of medullary threads. In the course of the nerves there are a number of knots; these are called *ganglions*; they are commonly of an oblong shape and of a grayish colour, somewhat inclining to red, which is perhaps owing to their being extremely vascular. In particular parts of the body, the nerves come in contact with each other, and the bundles composing them are mutually interwoven to such a degree that they cannot be disjoined without violence. These communications are called *plexuses*, and are found particularly in the abdomen behind the stomach, and in the region of the pit of the stomach, near the liver, mesentery, heart, &c. The final terminations of the nerves are various, particularly those which run to the organs of sense. In the auricular organ, for instance, the nerves terminate in a soft mass like pap, surrounded with moisture; the optic nerve terminates in a medullary skin; the nerves of taste terminate in little *papillæ*; those of feeling in the points of the fingers, and the surface of the skin in general; those belonging to the muscles are lost in the texture of the same, so that their terminations cannot be accurately ascertained. All the nerves are embraced under the general head of the *nervous system*. This is most intimately connected with the brain and the spinal marrow, which may be regarded as a prolongation of it. The brain is the centre, from which or to which proceed all impressions communicated to the nerves. The substance of the nerves is the same medullary matter which constitutes the brain, resembling the white of an egg, and appearing, to the unassisted eye, as if composed of little balls. The central termination of all the nerves is in the brain and spinal marrow, where they branch out into the skin or the interior of the organs. The various isolated, and, in part, heterogeneous structures of which the body consists, which are mechanically joined by the cellular tissue, the membranes, and the ligaments, are united into one harmonious whole by means of the nerves. The vascular system connects them only so far as it furnishes the supply of blood required for their support and their operations; but it is properly the nervous system which imparts to all their life, governs their operations, and establishes their sympathy and mutual action. This is effected by means of that portion of the nervous system which is diffused through the abdomen, forming many nets and plexuses, and constituting what is called the *vegetative*, or *reproductive*, or *organic nervous system*, because the growth and support of the body are effected by it. Another part of the nervous system affords the means of consciousness and voluntary action. This is the *brain* or *cerebral system* (*see these two articles*), which excites the nerves that put in action the muscles of voluntary motion, and those which supply sensibility to the organs of sense, and convey to the brain the impressions thence received. The nerves which communicate with the organs of sense, run in pairs —the first pair (olfactory nerve) to the nose, where it is spread over the surface of the nostrils, and forms the power of smell; the second (optic nerve) to the eyes; this is round, thick, and penetrates from behind the ball or globe of the eye (through a round plate of the firm coat of the ball, containing many little apertures), and is spread out on the inner and concave surface of the globe into a thin coat called the *retina*, on which the images of external objects are formed; the eighth pair (auditory nerves) are spread over the interior of the ear, and are sensible to the vibrations of the air. From the numerous ramifications of the ninth pair come the nerves of the tongue, which give rise to the sense of taste. The general sense of feeling is situated particularly in the skin; and peculiarly in the points of the fingers. This sense is produced by a variety of nerves diffused over the skin, and those parts which are most sensitive are supplied with the greatest quantity of nerves, which form entire series of contiguous nervous *papillæ*; for instance, at the lips, the points of the fingers, &c. Thus the action of the nerves is reciprocal from without inwards, and from within outwards—the first, because the impressions on the organs of sense are communicated by the nerves to the brain, and there form perceptions and feelings; the second, because the voluntary motions are produced by communications from the brain to the nerves, while the reproductive part of the nervous system quietly supports the whole machine, and, in a sound state of the body, is recognised only by the operation of the appetites, and by a general feeling of ease throughout the system; but, in a diseased state, gives rise to general uneasiness and pain. The power of the nervous system has no fixed point, but is variable, even in the same subject. In sleep, the activity of the cerebral system is impaired, that of the reproductive system heightened; therefore, in quiet sleep, the operations of the senses and the voluntary motions cease, while the activity of the organs of respiration and circulation, of digestion, secretion, and nourishment continues. From what has been said, it appears that the whole action of the body depends upon the nervous system. See *Nervous Diseases*.

NERVOUS DISEASES (*neuroses*) are such as consist in disturbed affections of sense and motion, unattended by any chronic or acute inflammation, or hemorrhage, or by any disturbance of the circulation. Nervous pains are called *neuralgiæ*; *spasms* are involuntary contractions in organs which have muscular fibres, or which are merely susceptible of contraction; *convulsions* are involuntary and irregular contractions, alternating with relaxations, in one, or several, or all of the muscles, simultaneously or successively; *tetanus* is a permanent contraction of a certain class of muscles, ordinarily followed by death; *contraction* is a retraction of the flexor muscles of one member or of two parallel members; *paralysis* is the diminution or loss of the sensibility of an organ of sense, or the contractility of an organ of motion. The pains, spasms, paralysis, take different names, according to the parts affected. The most remarkable of all the *neuroses* is *apoplexy* (q. v.), which is characterized by the suspension or successive loss of sense and understanding, as well as of motion. The affections of the mind, known under the names of *mental alienation*, *insanity*, *idiocy*, &c., are also *neuroses*; that is, disturbances in the action of the nervous system. It has been asserted that nervous diseases are rendered more common by the progress of civilization; and, in fact, the nerves become more irritable, and therefore more liable to be diseased with the progress of intelligence. But the refinements of the moderns in their food and drinks, the use of fermented liquors, wine, coffee and tea, are the most frequent causes of nervous maladies. The early and excessive use of these liquids provokes the nerves, and diseases the stomach, and gives rise to cerebral fevers in children, to the vapours or hysterics (q. v.) in women, to hypochondria (see *hypochondriasis*), apoplexy and paralysis in men. It is not always easy to distinguish the symptoms of *neurosis* from those of inflammation; but, as the treatment in the two cases must be entirely different, it is of the greatest importance to use every caution in this respect. Particular medicines, which were considered as specific remedies in nervous diseases, were formerly in use; but experience has proved, that warm bathing, soothing drinks, vegetable diet, exercise, recreation, sometimes bleeding, at others rubefacients, opium in a few cases, when the pain is great, and Peruvian bark, are the best antagonists of *neurosis*. The treatment of nervous diseases, however, has often embarrassed the scientific practitioner, as they often resist the most skilful and sagacious applications. See the articles *Nerves*, *Mental Derangement*, &c.

NESS; a termination common in Scandinavian geographical names, and signifying *promontory*.

NEST; the place or bed formed or used by a bird for incubation, or the mansion of her young until they are able to fly. The word is also used for the bed in which certain insects deposit their eggs. The construction and situations of the nests of birds are as remarkable as the variety of materials employed by them. Some birds build their nests with what, in the case of rational beings, would be called great ingenuity; others with the greatest negligence. They seem to be governed in the process merely by instinct. In fact, naturalists place this class of animals below the *mammalia*. Thus birds of cooler climates, that build early in the spring, require warmth and shelter for their young, and the blackbird and thrush line their nests with a plaster of clay, perfectly excluding the keen icy gales of the season; yet, should accident destroy this first abode, they will construct another, even when the summer is far advanced, upon the model of the first, and with the same precautions against severe weather, when all necessity for such provision has ceased, and the usual temperature of the season rather requires coolness and a free circulation of air. The house-sparrow will commonly build four or five times in the year, and, without the least consideration of site or season, collect a great mass of straw and hay, and gather many feathers to line the nest. The wood-pigeon and jay, which build on the tall underwood in the open air, will construct their nests so slightly, and with such a scanty provision of materials, that they seem scarcely adequate to support their broods; and the rook's nest is, at times, torn from its airy site, or its eggs are shaken from it by the gales of spring. The house-martin builds its earthy shed under the roof of the house, &c., and usually brings out its young in July and August; but one rainy day at this period, attended with wind, will often moisten the earth that composes the nest; the cement fails, and all the unfledged young ones are dashed upon the ground. The variety of spots chosen by birds according to their species is endless.

NESTOR was the most distinguished of the Grecian heroes at Troy for wisdom, the consequence of his great age (hence the phrase *a Nestor*); he was also particularly celebrated for his mild and persuasive eloquence. These are the qualities Homer has attributed to him in the Iliad. Nestor was the son of Neleus and Chloris. He was educated at Gerenia, and succeeded his father as prince of Pylos. In his youth and manhood, he distinguished himself by many bold exploits, but also early acquired the reputation of a prudent counsellor and persuasive orator. He signalized himself among the Lapithæ, whom he assisted in their war with the Centaurs. After Lynceus and Idas, the sons of Aphareus, were killed by the Dioscuri, he also became king of Messenia. Notwithstanding he had lived through two generations, when the expedition to Troy was undertaken, he, nevertheless, took part in it, and conducted the forces under his command in twenty, or, according to some accounts, in ninety vessels to Troy. Whether we reckon a generation at a hundred years, as the ancients did, or at thirty years, as is usual with us, in either case Nestor was too old to take a personal share in the combats before Troy. The part which is attributed to him in the Iliad, is that of an experienced counsellor. He endeavoured to produce a reconciliation between Agamemnon and Achilles, and encouraged, advised, instructed, and blamed the Grecian heroes. Without his interference, the siege of Troy would more than once have been abandoned. After the capture of Troy, he returned to Greece. According to the Odyssey, Telemachus here visited him to obtain information concerning Ulysses. Homer states Eurydice, the oldest daughter of Clymene, to have been his wife; others, Anaxibia, the daughter of Craticus. He had several sons and daughters, but they are not distinguished in history. After Nestor had outlived three generations, he died quietly at Pylos, where, even to a late period, the inhabitants have pretended to distinguish his dwelling and his grave.

NESTOR, a Russian historian, born about 1056, was a monk in the Petscherian or cavern monastery in Kiev, and died after 1116. Besides biographies of abbots and other pious members of his monastery, the fragments of which were collected by another hand, he wrote a chronicle in his vernacular tongue, which is an important contribution to the history of the North, having evidently imitated and profited by the Byzantine historians with regard to the most ancient history. The other sources from which he obtained information are unknown. He wrote much as a contemporary, or from the traditions of an old monk of the monastery, Jan. This work is modelled according to the spirit of his age. Pious reflections and scriptural language are frequently interwoven with the narration, and the persons are usually introduced speaking. But the original text of his chronicle is lost, and by the interpolations of those who have continued the history (bishop Sylvester of Kiev, and many others) to the year 1203, it is altered to an incredible degree, so that no correct decision can be passed upon his historical merits before strict inquiries have been made to determine how much of the historical information now extant is derived from the ancient Nestor. It has never yet been determined with certainty to what year his researches extended. Schlozer has rendered great service to this father of Russian history, by the publication of his unfortunately not completed work, Nestor's Russian Annals (from 862 to 1110), compared with the original Sclavonic text, and with the errors and interpolations expurgated as far as possible, explained and translated (into German only to the year 980, Gottingen, 1802—9, 5 vols.), besides which may be mentioned, as an abridgment and improvement, Jos. Muller's Ancient Russian History, from Nestor, with reference to Schloser's Russian Annals (*Russische Annalen*), which are here corrected, completed, and enlarged (Berlin, 1812). A part of Nestor's chronicle from the Puschkinian manuscript was printed for the Russian historical and antiquarian society (Moscow, 1814, Timkowsky's edition).

NESTORIUS, and NESTORIANS. See *Syrian Christians*, and *Christians of St Thomas*.

NESTS, EDIBLE. See *Birds' Nests*.

NET (Italian, *netto*, pure); that which remains of a weight, quantity, &c., after making certain deductions. Thus, in mercantile language, the *net weight* is the weight of any article after deducting tare and tret: *net profits, income*, &c., is the absolute profit or income, after deducting expenses, interest, &c. It is opposed to *gross* (*brutto*).

NETHERLANDS, KINGDOM OF THE.—*History of the Netherlands.*—I. *Till* 1548, *or till the Union under the House of Austria.*—The Netherlands comprise the Lowlands, or north-west declivity of the great basin formed by the forest of Ardennes, the Vosges, the Hunsdück, the Siebengebirge, the Spessart, Odenwald, and Hartz, in the valley of which the Rhine flows down through the Netherlands. The southern portion of these Low Countries belonged, in Cæsar's time, to Gaul (*Gallia Belgica*). That great general declared the Belgians the most warlike of the Gallic tribes. The northern portion, situated between the Meuse, the Ural, and the Rhine, was called the *Island of the Batavians;* and, with Friesland, formed part of Germany. The part of the Netherlands north of the Rhine, was inhabited by the Frisians, who were, as well as the Batavians, a German nation. We are made more particularly acquainted with both, from the struggle which they so honourably sustained, under the command of Civilis, against the Romans. At subsequent periods, we find them engaged in commerce and piracy, and they were finally overpowered by the Romans. In the fifth century the Batavians, and in the sixth the Belgians, were reduced to submission by the Franks; but the Frisians were not subdued until the seventh century. (See *Belgians, Batavians*, and *Frisians*.) By the peace of Verdun, in 843 (see *France*), Batavia and Friesland were annexed to the new kingdom of Germany, and administered by governors who eventually became independent. In the eleventh century, the country was divided into duchies, counties, and imperial cities: Brabant or Lower Lorraine, and afterwards Luxemburg, Limburg, and Guelders, were governed by dukes; Flanders, Holland, Zeeland, Hainault, Artois, Namur, and Zütphen, by counts; Friesland Proper remained a free lordship; Utrecht became a bishopric: the secular authority of the bishop extended over Groningen and Overyssel. Of all these rulers, the counts of Flanders were the most powerful; and, after their possessions had passed, in 1383, to the more powerful house of Burgundy, the latter, partly by marriages, partly by force or cession, obtained possession of the largest part of the Low Countries. The last duke of Burgundy, Charles the Bold (q. v.), fell, in 1477, in battle with the brave Swiss; his daughter Mary, by her marriage with the emperor Maximilian, brought the Netherlands to Austria, and Charles V., grandson of Maximilian, born in the Netherlands, united (1548) the seventeen provinces with Spain, by the pragmatic sanction, as for ever inseparable from it, according to the rule of primogeniture. From 1512, they formed, under the name of the Circle of Burgundy, an appendage to the German empire. East Friesland continued, under its own princes, attached to the circle of Westphalia—II. *Till* 1810, *or till the Union with the French Empire.*—Under the reign of Charles V., the Protestant religion, though severely opposed, spread in the Belgic and Batavian provinces. The number of persons executed, during his reign, in these countries, for heresy, is computed at 100,000. The rulers of the Netherlands, even Charles V., had always respected their privileges and ancient liberties, by which means the country had been rendered prosperous, and had been a source of wealth to the monarchs. Charles's son and successor, the cold tyrant Philip II., abandoned the maxims of his prudent predecessor. Born in Spain, he treated the distant Netherlands with the greatest severity. His governors, especially the cruel Granvella, assailed the established rights of the provinces; and, by means of the inquisition, all freedom of religious opinion was to be exterminated. These measures excited the wrath of a free people; great numbers of industrious artisans, particularly workers in wool, fled to other countries, especially to England and Saxony; the nobility conspired in defence of their rights (see *Gueux*); and the Protestants publicly celebrated their divine worship with all the defiance of enthusiasm. When Granvella was recalled, in 1564, it was too late to extinguish the conflagration he had kindled, except by force. Philip sent the bloody Alva (q. v.), under the axe of whose executioner fell the heads of the noblest of the nation—Egmont and Hoorn. The prudent prince of Orange had disappeared only to reappear in arms, while Alva sacrificed thousands to his fanatical rage. Even the moderation of his wise successor Zuniga, could not calm the excited spirits; and the politic prince of Orange, though often defeated by don John of Austria and Alexander of Parma, finally came off victorious in the unequal conflict for freedom and religion. The struggle would have been sooner terminated, had not the different situation of the Dutch provinces—the mutual jealousies of the nobles, each aiming at his own aggrandizement, and the unhappy religious suspicions prevailing between the Catholics and Protestants—done much to retard the victory. Almost all the other provinces joined, indeed, at Ghent, in 1576, the open rebellion of Holland and Zeeland; but the abilities of the Spanish governor, the prince of Parma (see *Farnese*), were successfully employed in reducing the most southern, or, as they were called, the *Walloon* provinces, to the Spanish power; and, soon after, in subjugating Brabant and Flanders, by force of arms, in effecting which he was much assisted by the flight of the most intelligent and influential citizens, who repaired mostly to Holland. In 1579, the five northern provinces,—Holland, Zeeland, Utrecht, Guelders, and Friesland,—concluded the celebrated union of Utrecht, by which they declared themselves independent of Spain. They were joined, in 1580, by Overyssel, and, in 1594, by Groningen. Thus, after the united provinces had renounced their allegiance (July 26, 1581) to the king of Spain, "as a tyrant," arose the republic of the United Netherlands, afterwards commonly called *Holland*, from the province of that name, which was superior to the others in extent, population, riches, and influence. After the assassination of William (q. v.) of Orange, July 10, 1584, Maurice (q. v.) became stadtholder (governor), and followed the steps of his predecessor. His victories at Nieuport and in Brabant, the bold and victorious exploits of the Dutch admirals against the navy of Philip II. (q. v.), the wars of France and England against Spain, and the apathy of Philip II., caused, in 1609, the peace of Antwerp, of twelve years' duration. But Holland had yet to go through the thirty years' war (q. v.), before its independence, now recognised by all the powers except Spain, was fully secured by the peace of Westphalia. While religious disputes distracted the other European states, Holland offered a safe asylum to the persecuted. All religions were tolerated. The continually increasing population found it necessary to seek employment beyond the ocean. Compelled by necessity to make war against the Spanish fleets, the republicans soon became excellent sailors, and enterprising, indefatigable merchants, who visited every sea, and to whom no profit was too distant, no obstacle too discouraging. The commerce of Cadiz, Antwerp, and Lisbon fell into their hands; and in this way the United Netherlands were, in the middle of the seventeenth century, the first commercial state and the first maritime power in the world; for, with about 100 vessels of war, they bade defiance to every rival, while England and France rejoiced in the humiliation of the dreaded monarchy of Spain. The East India company (q. v.), established in 1602, with a capital of only 6,459,840 guilders, conquered islands and kingdoms in Asia. (See *India, Dutch;* and *East India Companies.*) With about 200 ships, they carried on a trade with China, and even with Japan. They alone supplied Europe with the productions of the Spice islands. The gold, the pearls, the precious jewels of the East, all passed through their hands. The West India company was not so successful, on account of the jealousy of England and France. Holland, nevertheless, for a long time maintained the dominion of the sea; Tromp and Ruyter were victorious, and Louis XIV., who had laid a deep plan for humbling the daring republic, was finally exhausted, and obliged to sue for peace. But these conflicts with England and France, and the impolitic participation in the Spanish succession war, enfeebled Holland; while the republican jealousy of the ambition of the house of Orange kindled the flames of party rage and civil war, which prevented the adoption of a fixed and consistent course of policy. From the time of Maurice and Barneveldt, the two leading parties (the Orange and the patriotic, or the anti-Orange) had gradually assumed various shades of opinion, under leaders who pursued their own selfish views. By the same causes, religion was brought into play: the strict Calvinists were, in general, Orangists; those of other opinions, patriotic; thence the frequent political convulsions, caused sometimes by the encroachments of some stadtholders, sometimes by popular commotions, and which were always preceded by an arbitrary administration of government, or unsuccessful wars. This was shown in 1618, 1672, and 1702, and, more fully, in 1747, in which year the house of Orange triumphed over the republican party. William IV. received the dignity of stadtholder in all the seven provinces, hereditary in his male and female descendants. The Spanish or Catholic Netherlands had, meanwhile, become the fatal apple of discord, for which Austria and France contended for two centuries. By the peace of the Pyrenees, in 1659, and of Aix-la-Chapelle, in 1668, Spain was finally compelled to cede to France all Artois, some places in Flanders, Hainault, Namur, and Luxemburg; and these countries were subsequently called the French Netherlands. By the peace of Utrecht, which put an end to the Spanish succession war in 1713, the Spanish Netherlands were restored to the house of Austria, which held them till the French revolution, though they rebelled against Joseph II., especially under Van der Noot. In 1782, that monarch violated the barrier-treaty of 1715, which gave the republic of the United Netherlands the right of keeping garrisons in some Belgic fortresses on the French frontier; he compelled the Dutch garrisons to evacuate them, and caused most of the fortresses to be demolished. This measure greatly facilitated the conquest of Belgium by the French (1792 and 1794), which was ceded to them, in 1797, by the peace of Campo-Formio. Meanwhile the internal commotions in the United Provinces were not suppressed. The anti-Orange or republican party, by no means annihilated by the rendering of the stadtholdership hereditary in the house of Orange, raised its head anew in 1786. The disputes in 1781, with Louis, duke of Brunswick, who had been for thirty years, field-marshal of the United Provinces, and had exercised, for a time, the guardianship of the hereditary stadtholder William V., were merely preludes to the furious conflict that now arose. The wife of the stadtholder, sister of king Frederic William of Prussia, arrested by violent patriots, besought the succour of her brother. A Prussian army of 25,000 men appeared to avenge the insult, and defend the rights of William V. The resistance of the patriots was badly conducted and unsuccessful. After the storming of Amstelveen, Amsterdam fell (September, 1787) into the power of the Prussians. The superiority of the stadtholder's party was decisive; the rights of the house of Orange were confirmed, with additions, and a close alliance was concluded between the republic, Great Britain, and Prussia. The anti-Orange party was, however, only intimidated, while its old hate was imbittered. When, therefore, the victorious banners of republicanized France waved (1794) on the frontiers of Holland, the malcontents rose. Pichegru, aided by the severity of the winter of 1795, and by the favour of the popular party towards the French, made an easy conquest of Holland. The hereditary stadtholder fled, with his family, to England, and the Batavian republic was formed May 16, 1795. The old provinces were merged into a sole republic; the legislative power, in imitation of the French, given to a representative assembly; and the executive, to a directory of five. The new republic was obliged to cede to France some southern districts, particularly Maestricht, Venloo, Limburg, and Dutch Flanders; to form a perpetual alliance with that state; pay a sum of 100,000,000 guilders; and allow French troops to occupy its territories. Six years after, it was found necessary to alter this constitution (Oct. 18, 1801). The republic was again divided into the old provinces; in addition to which the land of the generalty was formed into an eighth. The administration of the government was simplified; the legislative assembly diminished to thirty-five deputies; and the executive power was extended to a council of state of twelve men. Notwithstanding these alterations, the Batavian republic, incapable of effecting its ends with the feeble remains of its strength, saw its fleets overpowered by those of Britain; its colonies laid waste; its commerce limited to a coasting trade, and to the domestic consumption; and the bank of Amsterdam ruined. By the peace of Amiens, in 1802, it was deprived of one of its richest colonies—Ceylon. Scarcely were the hopes of better times awakened, when Holland was involved in the new wars of France with Great Britain. Surinam and the Cape fell into the power of the British. British vessels blockaded the coasts of Holland, and thus the last nerve of its prosperity seemed destroyed. For the third time, the Dutch constitution was changed (April 29, 1805). The state was divided into eight departments, and a legislative body of nineteen members, with a pensionary (Schimmelpennink), chosen for the term of five years, and who administered the executive power, was created. A council of state, consisting of from five to nine members, was assigned to the pensionary, and five ministers had the care of affairs. The pensionary received an indefinite sum, for the management of which he was not required to give any account. But in this stormy period, even Schimmelpennink's virtue was insufficient for the salvation of a country which, by the loss of its ancient independence, and of its abundant resources, was already brought to the verge of ruin. In this troubled situation, the only alternative seemed, to be to incorporate Holland altogether with the French empire. This measure, long meditated, was accomplished in 1806. The brother of the emperor, Louis Napoleon, received possession of Holland as a sovereign kingdom, and, June 5, 1806, he was proclaimed king of Holland. By the treaty made with France, (May 24,) it was stipulated, that Louis Napoleon should be hereditary, constitutional king of Holland, and that the throne should be secured to his lawful male posterity, with a provision that the crowns of France and Holland should never be united. The king remained hereditary constable of France, and, with all his children, subject to the French imperial family statute. In Holland, he possessed, without limitation, the executive power, the right of appointing to civil and military offices, the right of pardoning, and the exclusive government of the colonies. A council of state was also constituted, of thirteen members, among whom were four ministers of state. The legislative body consisted of thirty members, and it was provided that this body should be increased in proportion to the extension of the territory of the state. But Holland was equally unfortunate as a kingdom. It was excluded from the commercial privileges of France, though it had to follow all the wars of Napoleon. The national debt was augmented to 1,200,000,000 guilders. The only means by which the merchant could obtain a support was the smuggling trade with England. Almost all the sources of former prosperity were obstructed; and, when Napoleon's decree of November 11, 1807, was promulgated from Milan, and the tariff of Trianon, with all its terrible consequences, went into operation, the trade of Holland was totally ruined. In 1807, East Friesland and Jever were annexed to it, but it was obliged to cede, in return, the territory situated between the French frontier and the Meuse, together with a part of Zeeland, and the fortresses Bergen-op-Zoom, Breda, Hertogenbosch (Bois-le-Duc), Gertruidenburg, Middleburg, and Flushing. The war against Austria, in 1809, gave rise to the descent of the English on Zeeland (Walcheren), which only accelerated Holland's ruin. The country, at the same time, experienced some great calamities. In January, 1809, the whole tract from Emmericht to Dortrecht and Rotterdam, upwards of 1000 square miles, was overflowed; more than 300 men lost their lives in the floods; and several thousand head of cattle, many houses and mills, even whole villages, were swept away. The exertions of the good but weak king, to alleviate the general distress, were of little avail, particularly after the landing of the English, as he lost the friendship of his brother. The misunderstanding increased, and the treaty of Paris, of March 16, 1810, delayed the last blow but for a few weeks. Louis, not to involve the country in his personal difficulties, or produce a war with France, the consequences of which could easily be foreseen, voluntarily and unexpectedly abdicated the crown, in favour of his eldest son, a minor, July 1, 1810, and withdrew into the Austrian territory, as a private individual. Napoleon did not, however, sanction his brother's measures. July 4, French troops occupied Amsterdam, and, by the imperial decree of July 10, 1810, Holland was incorporated with the French empire; Amsterdam declared the third city of the empire; and six senators, six deputies in the council of state, two judges in the court of cassation, and twenty-five deputies in the legislative body, were assigned to Holland. The army and navy, both officers and soldiers, were received into the imperial service; and the arch-treasurer of the empire, the duke of Piacenza (Le Brun), became the emperor's representative in Amsterdam, and governed the country till January 1, 1811, when the whole constitution was to be modelled on the French. The Dutch departments, which had already been formed in the time of the kingdom, now constituted two military divisions; the conscription was introduced; and half of the forces levied were destined for the army, half for the navy.—III. *Till* 1815, *or till the Union of the Netherlands, under the House of Orange.*—Thus all the seventeen provinces of the Netherlands were united under the dominion of France. But this state of things continued only till the end of 1813. Napoleon's defeat at Leipsic produced a change in the fate of Belgium and Holland; the armies of the allies advanced against France; a combined Prussian and Russian force, under general Bülow, was sent against the Netherlands, and was joined by a detachment from England, under general Graham. November 20, 1813, general Bülow issued a proclamation, calling upon the Dutch to join the allies against the French. On the 18th of this month, Gysbrecht Charles van Hogendorp, a moderate adherent of the old Orange party, had secretly assembled in his house some of the members of the old government, who, in 1788—95, had managed the helm of state, and endeavoured to persuade them to constitute themselves provisionally as the states-general; but they did not dare engage in the undertaking. Hogendorp next invited those who had held the reins of state in 1786 and 1787, and after 1795, and who, though formerly anti-Orange, would gladly have acceded to the old republican Orange system, had they not been rendered distrustful by their exclusion from the first meeting. After two unsuccessful attempts, the seventeen first confederates (among whom the most distinguished were the count Limburg-Styrum; the lords Van Perponcher, Fagel, and Changuion; the generals Sweerts, Van Landas, and De Jonge; professor Kemper and the advocate Fannius Scholten) appointed from their body Gysbrecht van Hogendorp and baron Van der Duyn van Maasdam, a man of liberal principles, as a provisory government, to preserve the revived republic, till the prince of Orange should arrive from England, whither Van Perponcher and Fagel were despatched (November 19) to invite him over. The duumvirate exerted themselves to the utmost to accomplish this design. They sent messengers to the headquarters of general Bülow, at Munster, and to Frankfort on the Maine, to the allied monarchs, who immediately resolved to aid the attempt of the Dutch. Kemper and Scholten were sent as commissioners to induce Amsterdam to declare itself publicly; but, owing to the proximity of the French headquarters, under general Molitor, at Utrecht, this could not be effected; but they received, nevertheless, the strongest assurances of attachment to the house of Orange. The hereditary stadtholder arrived at the Hague November 30, where, after spending a day, he proceeded, in December, to Amsterdam. The commissioners of the duumvirate (Kemper and F. Scholten) had, as it is thought, of their own motion, issued a proclamation, ending with the declaration, "The Netherlands are free, and William I. is the sovereign prince of this free country." The prince, however, accepted the nomination only on condition that his power should be restrained by a constitution, which (these were his words) "should guarantee the privileges and liberties of the people, and secure them from every encroachment." A board of fourteen members, among whom were the former duumvirate, was intrusted with the framing of this constitution, which, however, did not wholly answer the expectations of unprejudiced and intelligent patriots. More than a third of it was occupied with the rights and privileges of the reigning dynasty; the most important civil regulations, particularly those of the provincial estates, were left to be settled subsequently; and the principles of the judiciary and of the finances remained undetermined. This sketch was made public before voting on it; but all amendments to the constitution were prevented, by the rule forbidding all remarks and discussion in the convention, to which 600 notables, from all the departments of the former United Provinces, were summoned. Only 475 appeared. Among the 125 absent, there were distinguished men, who would neither have submitted to express their opinion merely by yeas or nays, nor would have deemed themselves justified in conferring the sovereignty, without express instructions, or without the loudly-declared assent of the whole nation. Of those present, many acquiesced conditionally, although their votes were reported as unconditional. The result was, that there were 26 votes only unconditionally opposed to the plan of the constitution, which was therefore adopted, by a majority of 449 votes. By a resolve of the congress of Vienna, the Belgic provinces were united with the United Netherlands, to form the kingdom of the Netherlands, and the prince William I. (q. v.) was recognised by all the powers as sovereign king of the Netherlands. As an indemnification for the cession of his territories of Nassau, in Germany, the duchy of Luxemburg was given to him, with the title of a grand-duchy, which still, however, belonged to the Germanic confederation; the king of the Netherlands, as grand-duke of Luxemburg, had a seat (the 11th) in the diet of the confederation, and three votes in the *plenum*. It was left in the power of the king to make such a disposition as to the succession of the grand-duchy, as he might deem proper. To these territories was also annexed the ancient bishopric of Liege.—IV. *Since* 1815.—In June, 1815, the king acceded to the Germanic confederation. The incorporation of so many provinces, inhabited by people who, although anciently of the same origin, differed in manners, customs, and religious opinions, naturally rendered a revision of the constitution necessary. Conformably with the 143d article, the 55 members of the states-general were eventually doubled, by the provincial estates, in order to deliberate on the needful alterations. A majority of two thirds was requisite for the adoption of any proposition, which was then to be submitted to the approval of the prince. These preliminaries having been gone through, a convention of the notables was assembled at Brussels, of whom a greater number, in proportion to the population, was from the southern provinces. One sixth of these, however, did not appear, so that the whole number present was 1323, of whom 527 voted for, and 796 against, the constitution. But it being found that not only some votes had been given conditionally, contrary to rule, but that 126 votes were given against the constitution merely from religious motives, these last, together with the 280 absent, were counted in favour of the constitution, for which a majority was thus obtained; and, August 24, it was declared to be adopted. October 11, a treaty on the subject of the Belgic national debt was concluded between the king of the Netherlands and Austria. By the second peace of Paris, November 20, 1815, France ceded to the kingdom of the Netherlands whatever it still retained of the former Austrian Netherlands, particularly a rich mineral district, situated in the centre of the Ardennes, between Hainault and Namur, the loss of which had been severely felt by the inhabitants of the Netherlandish province of Hainault, with the fortresses of Marienburg and Philippeville. The crown of the Netherlands also obtained the sovereignty of the small duchy of Bouillon (q. v.), between Luxemburg and Champagne. By the treaty with England, of October 29, 1814, in consideration of the relinquishment of all the claims of Holland to the Cape of Good Hope, and to the colonies of Demerary, Essequibo, and Berbice, all the other colonies that Holland possessed anterior to 1794, in Asia, Africa, and America, were restored to William I. May 17, 1816, a Netherlandish fleet, under the admiral Van der Capellen, joined the English under lord Exmouth, in the bay of Algiers, and compelled the dey of Algiers to recognise the European law of nations. On the 25th, a compact was concluded between the kings of Prussia and of the Netherlands respecting the cession of a tract of country to the latter. June 21, 1816, the king of the Netherlands acceded to the holy alliance. The want of a common feeling between the Belgic and Dutch subjects of the new monarchy was strongly displayed on several occasions. The great influence of the Belgic clergy (who were disaffected to a Protestant dynasty), even over the higher classes; the mutual dislike of the Belgians and the Dutch; the dissatisfaction of the latter with the long residence of the court in Brussels; and the division in the Dutch provinces, since the establishment of the monarchy, of the professed adherents of the reigning family into the old Orange party, or friends of a hereditary stadtholderate or republican system, and the new Orange party, or partisans of the monarchy (to which belonged the greater part of the nobility and army)—caused much discontent, which was, however, counterbalanced by the increasing confidence in the personal character and the conciliatory policy of the king. In the foreign relations of the kingdom, the government, for the most part, pursued the British system. The marriage of the crown prince with a Russian grand princess produced beneficial relations with that empire. With the bordering state of Prussia, commercial subjects produced some collisions; but between the two reigning families a close connexion has existed since the marriage of prince Frederic, in 1825, with Louisa, daughter of the king of Prussia. The political relations of France with its new neighbour were pacific. With Sweden and Denmark, as with Spain and Portugal, the relations were purely commercial. The commercial relations with the United States of North America had been established on principles of reciprocity. The Netherlands had recognised the new republics of South America, and, in 1826, sent a deputy to the congress of Panama. Though this incongruously compounded state had made some progress since 1818, under the influence of its constitution, yet the amalgamation of the Dutch and Belgians into one nation was not successful; both nations disdained to bear the common name of the state of the *Netherlands*. This reciprocal aversion of the northern and the southern people, stimulated by the events of late years, was several times exhibited, with great animosity, in the church, in the army, and even in the chambers of the states-general. But the spirit of dissension entered most deeply into the popular feeling, and was maintained in vigour for years, by some Catholic clergy, who inculcated opposition to the constitutional system in the pulpit and in the confessional; for the pope had allowed the Belgic priests to grant absolution to the Netherlandish officers of government only when they swore fidelity to the constitution merely in a civil sense; while the government allowed no restriction. The opposition of the Catholic clergy to the government, gave rise, at first, to such great dissatisfaction on the part of the people, that the government was obliged to organize a strict police in the southern provinces, which again produced new complaints. It was therefore abolished, April 1, 1818. The government was also forced to put a stop, in 1825, to the influx of the French missionaries into Belgium. On the other hand, the pope issued a bull of excommunication against the schismatics or against the Jansenist bishops and archbishops of Utrecht, Haarlem, and Deventer, who had taken the oath of allegiance to the king. The relations of the Netherlandish government to the Roman court appeared, however, to be finally established, after long negotiations, by the concordate signed at Rome, June 18, 1827, by the Netherlandish ambassador count de Celles and the plenipotentiaries of the holy see, which concordate was ratified at Brussels, July 25, 1827. By it, the concordate concluded by Pius VII. with Napoleon, July 15, 1801, became valid in the northern provinces of the kingdom, as it had previously been in the southern. Each diocese had its chapter and its seminary. The chapter of a vacant see was to propose candidates from the Netherlandish clergy; those to whom the king should object, were to be struck from the list; the chapter was then to choose from the approved list the bishop or archbishop, whom the pope was immediately to confirm, if he should find him properly chosen. But the execution of this concordate, which did not meet with the approbation of a great part of the nation, was attended with new difficulties; the government, though desirous of retaining the philosophical college founded at Louvain (q. v.), in 1825, as a useful institution for all theologians, was obliged to abolish it in 1830. To the five bishoprics (Mechlin—the metropolitan—Liege, Namur, Tournay, Ghent) three new ones (Bruges, Amsterdam, and Hertogenbosch) were added. Another cause irritated the Belgic people in particular—the prohibition of the French language. As the difference of language rendered the union of the southern and northern Netherlands into one nation difficult, the government, while it allowed the use of the French as well as the Dutch in the proceedings of the states-general, abolished, by the ordinance of July 11, 1818, the use of the French language in judicial proceedings, and by the public authorities, only allowing advocates to make use of it for a certain period. Another royal edict, of September 15, 1819, required that in Limburg, East and West Flanders, and in Antwerp, no other but the national language, the Flemish-Dutch, should be used in public business: this rule, indeed, it became subsequently necessary to soften; but, October 26, 1822, it was anew ordered, that the national language alone, the Dutch or Flemish, should be used in schools, as well as in all public transactions. January 1, 1823, this rule was introduced in all the courts of justice, even in Brussels. The French language, nevertheless, remained prevalent there in society, and it was found necessary, till the end of 1825, to allow the advocates who had never yet spoken before court in Dutch, to argue their causes in French. In the chambers, especially in the second, speakers were heard in three different languages, who, perhaps, in many cases, did not understand each other; the Belgic deputies speaking French, the ministers and the ministerial party, partly Dutch, partly Flemish. The suppression of the French language, therefore, made two opposite parties the secret friends of France—the Catholic Belgians, apprehensive for their church, because they believed that the object was to propagate the Protestant faith by means of the prohibition of French; and the Brabanters and Flemings, adhering to France from old predilection. Thus notwithstanding the prohibition of the French and German languages in public life, the bonds of national unity were by no means tightened. On the contrary, besides the diversity of language and religion, other causes separated the southern provinces from the northern. The administration of justice was to be regulated by a new civil code. This code was drawn up in the council of state, and for several years submitted to a strict examination in the sessions of the states-general. The settling of the national finances was the most difficult problem for legislation. The greatest obstacle lay in the uniform levying of taxes. Belgium, a manufacturing, agricultural country, wished to place the burdens on articles of export and import; while Holland, to spare its own commerce, wished to impose them on real estate. The budget, therefore, always employed a great part of the time of the states-general, who convened in October of each year, alternately at the Hague and at Brussels. The proceedings in the chambers were often exceedingly turbulent. The new finance law created such dissatisfaction among the people, especially what related to the meal tax, that in the grand duchy of Luxemburg, in January, 1823, disturbances arose, which it was found necessary to quell by force. After deducting the deferred debt, which bears no interest, the true debt amounted, in 1823, to 593,578,900 Dutch guilders, or over 237,000,000 dollars. To promote the unity of the administration, a ministerial council was organized, September 10, 1823, to examine all bills proposed for legislation. In 1819, the army was diminished to 40,000 men, a force apparently hardly sufficient to garrison forty-seven fortresses. A civil militia of 25,000 men was therefore introduced. In May, 1822, the government abolished in the army the punishment of flogging, and established for criminals disciplinarian battalions. The construction of the frontier fortresses, to which the military payments of France were appropriated, was diligently prosecuted, and the duke of Wellington several times visited the frontiers of Belgium to supervise these operations. In 1827, the second son of the king, prince Frederic, was minister of war. The government did a great deal for every branch of public education, especially for the public schools; it protected the diffusion of information, and was deterred by no expense. In vain did the government of the Roman church endeavour, in 1825, to withdraw the Catholic institutions for instruction in Belgium from the inspection of the state authorities. For supplying the deficiencies in the history of the Netherlands, a royal commission was appointed, which published unprinted manuscripts. July 3, 1826, the king also established a commission for the statistics of the kingdom. The state of agriculture may be learned from the Brussels monthly periodical, *Journal d'Agriculture, d'Economie Rurale et des Manufactures du Royaume des Pays-Bas* (since 1816). Several attempts were made to reconcile the conflicting interests of the southern Provinces, which contain upwards of 3,175,000 inhabitants excluding 225,000 in the grand-duchy of Luxemburg, and those of the northern provinces, which contain above 2,100,000 inhabitants. The royal ordinance of June 28, 1818, recommended the formation of agricultural societies in each province of the kingdom. We ought in particular to mention the reclaiming of the marshes, and the cultivation of wild tracts by the establishment of pauper colonies (see *Colonies, Pauper*), &c. The establishment of these colonies, at Fredericsoord, in the northern, and at Wortel (since 1822), in the southern provinces, is worthy of imitation. Formerly, 10,000,000 guilders were annually appropriated to the poor. This sum is not only mostly spared, but an important addition is made to the country. The number of poor, moreover, diminishes, who formerly constituted, in several provinces, one sixth of the population. In 1823, 682,000 persons were computed to stand in need of aid. A bank was established at Brussels, in 1823, with a capital of

50,000,000 guilders (about 20,000,000 dollars), and a general association for the promotion of national industry commenced its operations there. Navigation was advancing. In 1823, 1312 vessels entered the Meuse, and 1323 left it; 2159 vessels entered the port of Amsterdam. A very important thing for the commerce of the country was the completion, in 1825, of the canal from Amsterdam to the Helder. This canal, which is 124 feet wide, over twenty feet deep, about fifty miles long, and cost upwards of 12,000,000 guilders, is a national undertaking worthy of the best times of Dutch commerce. (For an account of it, see the end of the article *Amsterdam*.) In 1823, the king established premiums for the encouragement of naval architecture, and, since 1815, has endeavoured to join with most of the neighbouring states in establishing the principle of freedom of commerce. New sources of wealth have been opened to the commercial spirit of the Netherlands by the restoration of the colonial system. For this purpose, the government maintains, in its East Indian archipelago, a considerable navy, and on Java an army of 10,000 men. By means of this force it was able to quell, in 1818, the insurrection on Amboyna and the neighbouring islands (which had been, during the war, under the mild administration of the British, and detested the old yoke of the Dutch), as well as another insurrection in the tributary kingdom of Sheribon, on the western part of Java; they were, nevertheless, obliged to combat again, in 1827, the rebellious Javanese. Much bloodshed also attended the restoration of their dominion over the sultan of Palembang, on Sumatra, and the recovery of the rich tin island Banca. The income of the spice islands had, indeed, lessened, because, during the British administration, several new spice plantations had been formed on the islands situated near Celebes and the Moluccas; and, in 1821, the cholera morbus swept away multitudes of men in the Dutch East Indies; on Java alone, more than 150,000 died; but the India trade, nevertheless, revived so rapidly, that the subscription opened by the government, in 1824, for the erection of a Dutch society, instead of 8,000,000—the sum required—produced more than 73,000,000. This joint-stock company, founded by the king, March 29, 1824, was to last till 1850. Its object is the promotion of national trade, of navigation, of naval architecture, of agriculture, and of manufactures, by the extension of commercial relations, and by the opening of new ways of disposing of Dutch productions. In Batavia, it maintains a factory, and in China an agency. In general, it employs only Dutch vessels, under the Dutch flag, commanded by Dutch masters. It is intended to restore the old relations with China, and to promote the commerce with America and the Levant, as well as the fisheries in the Indian seas. The foreign affairs of the Netherlands relate mainly to the colonial interests and the slave-trade. By a treaty with Great Britain, of May 4, 1818, the king bound himself to make the slave-trade punishable by law. Every Dutch subject who pursued or participated in that nefarious traffic was threatened with two years' imprisonment and a fine of 5000 guilders, by the law of November, 1818. Eventually, the treaty of Brussels of December 31, 1822, gave the British cruisers the right of capturing all Dutch vessels loaded with slaves, or only equipped for the purpose of procuring them; but, to put an efficient check to the slave trade, it was necessary to adopt severer measures, and a subsequent law pronounced sentence of forfeiture against all the vessels concerned in this trade, and threatened the principal participators in it with fines and hard labour, and their accomplices with incarceration; a prohibition was also placed on the importation, hitherto allowed, of slaves into the Dutch colonies from other parts (e. g. Brazil), where their direct introduction from Africa is still permitted. While the Netherlandish government yielded in these matters to the request of the British, the differences, produced by the commercial rivalship of the two states in the East Indies, were amicably adjusted. The Dutch were reinstated in the possession of their colonies, such as they had it in 1803. At that time they held dominion over the sultan of Palembang and Banca. In 1814, the island of Banca, with full sovereignty, was ceded by Britain to the king of the Netherlands, as an indemnification for Cochin; but, during the British rule on Java, the governor there had acknowledged the independence of the sultan in a treaty made in 1812; the British commissioner, in making the transfer, therefore, maintained that this cession to the Netherlands could only take place on condition of acquiescence in the treaties concluded in the mean while. But the Dutch government recovered its former supremacy, by deciding, in 1818, the contest of two brothers for the dignity of sultan of Palembang, making the reinstated sultan dependent on itself, and abolishing the code of laws introduced by the British. The British governor in Bencoolen (on Sumatra), Sir Thomas Stamford Raffles, immediately despatched troops to Palembang, expelled the Dutch sultan, and established his brother on the throne. The new sultan compelled, in July, 1819, the Dutch garrison at Palembang to retire to the island of Banca, and repelled several attacks of the Dutch in 1819 and 1820. Not till July 1, 1821, did the Batavian government, by means of a superior force, succeed in restoring the sultan expelled by his brother, with the aid of the British. They conducted the vanquished sultan to Batavia, where he was held under supervision. But the restored sultan left to the Dutch government at Batavia the whole civil administration of Palembang (judiciary, police, and finances), reserving for himself merely his annual income, his honours, and dignities. But the chief matter of dispute was finally settled at London, by the treaty of March 17, 1824. By this treaty, the king of the Netherlands ceded to Great Britain all his possessions and rights on the main-land of India, especially the city and fortress of Malacca, with its appurtenances; he promised never to make settlements in future on the peninsula of Malacca, nor to conclude any treaty with the native princes; at the same time, he renounced all intention to prevent the occupation of the island of Sincapore (q. v.) on the part of the British. On the other hand, the king of Great Britain ceded to the Netherlands the factory and fortress of Marlborough, with all the British possessions (presidency of Bencoolen) on the island of Sumatra. He promised never to make any settlement on that island, nor enter into any treaty with the native princes. He, moreover, renounced all intention of preventing the occupation of the island of Billeton and its appurtenances on the part of the Dutch, and he promised never to establish British settlements on the Carimon islands, or on the islands of Battam, Bintang, Lingin, or any other south of the straits of Sincapore. Neither party was to resign the above-mentioned territories to any other power, and, in case one party should abandon these territories, the other should immediately have the right to take possession of them. The mutual surrender took place March 1, 1825. By this treaty, the Netherlands have remained in exclusive possession of the Sunda islands, and of the most valuable part of the Moluccas, as well as of the spice trade with those parts; and after a short but bloody war, in 1824, they reduced to subjection the prince of Tanete, on the island of Celebes, who attempted to throw off his allegiance. In Europe, the state of the Netherlands maintained its dignity. When the dey of Algiers, disregarding the treaty of 1816, renewed, in 1824, under menace of war, the old demands for presents, the commander of the Dutch fleet in the Mediterranean, admiral Wolterbeck, replied, that the Netherlandish government had no intention of yielding to the claims of the dey; the admiral, at the same time, demanded, within twenty-four hours, an explicit declaration, whether he should consider himself at war with Algiers. The dey, hereupon (in October), desisted wholly from his demands, and signed anew the peace of 1816. With respect to the internal affairs of Italy, Spain, and Greece, the Netherlands have observed the strictest neutrality, so that, e. g. in 1823, the Dutch minister did not leave the king of Spain until his arrival in Seville. The same is the case with the Porte. The ambassadors of Russia, England, and France, when they left Constantinople, in December, 1827, placed the subjects of their powers under the protection of the Dutch ambassador. Natives of France, Spain, and Italy, obliged to leave their country on account of having shared in its internal disturbances, found an asylum in the Netherlands. For the history of the Netherlands subsequent to the Belgian revolution see the articles, *Antwerp*, *Belgium* and *Holland*.

Geography and Statistics of the Netherlands.—The kingdom of the Netherlands consisted, before the late revolution, of the seventeen provinces united under Charles V., but not altogether with the same boundaries. The county of Zütphen is united with Guelders, the lordship of Mechlin with the margravate of Antwerp; and, by the peace of the Pyrenees, in 1659, the county of Artois was ceded to France. On the other hand, Brabant and Flanders, on account of their extent, have been divided into North and South Brabant, and East and West Flanders. The district of Drenthe, formerly pertaining to Groningen, has become a distinct province. In its internal administration, the province of Holland is divided into two parts, South and North; but, in relation to the general government, it forms only one province. In Belgium, the French departmental boundaries have been made the foundation of the provincial divisions. The provinces of the late kingdom of the Netherlands are the following:—1. North Brabant (formerly Brabant); 2. South Brabant (formerly department of the Dyle); 3. Limburg (department of the Lower Meuse, with a part of the department of the Roer); 4. Guelderland; 5. Liege (department of the Ourthe); 6. East Flanders (department of the Scheldt); 7. West Flanders (department of the Lys); 8. Hainault (department of Jemappes); 9. Holland; 10. Zeeland; 11. Namur (department of the Sambre and Meuse, with the exception of Luxemburg); 12. Antwerp (department of the two Nethes); 13. Utrecht; 14. Friesland; 15. Overyssel; 16 Groningen; 17. Drenthe. According to official accounts of the year 1820, the kingdom (including Luxemburg) contained 25,375 square miles, with a population, in 1827, of 6,059,566 inhabitants, or 239 to the square mile. The kingdom (including Luxemburg) was bounded on the south and south-west by France, on the east by Germany (the Prussian-Rhenish provinces and the kingdom of Hanover), and on the west and north by the North sea. It extended from 49° 30′ to 53° 45′ N. lat., and from 2° 30′ to 7° 20′ E. lon. Among the inhabitants were upwards of 1,690,000 Dutch, 145,000 Frieslanders, 300,000 Germans, 3,360,500 Walloons, or Belgians, and 80,000 Jews. Among the Christians, about 3,414,300 were Catholics, 1,650,000 Dutch Reformed, 320,000 Lutherans, 115,000 Mennonites, 38,000 Remonstrants, and other denominations. The face of the country is, for the most part, very low in the north-west, where the Rhine, the Meuse, and the Scheldt empty into the sea. The Rhine, entering the Low Countries formerly at Schenkenschans, at present by the canal of Pannerden, separates into two branches,—the southern, the Waal (known as early as Cæsar's times under the name of *Vahalis*), and the Northern (which retains the name of the *Rhine*). From the latter, a canal, constructed by the Roman general Drusus, leads to the old Yssel, which proceeds from Munster, and, forming a junction with this river, under the general name of the *Yssel*, enters the Zuyder-Zee, between Zütphen, Overyssel, and the Veluwe. The Rhine, flowing westward, the other side of Arnheim, assumes, at Wyk te Duurstede, the name of *Leck*. A small stream, which is connected with the Leck by means of a sluice, there receives the name of the *Crooked Rhine*, and, between Utrecht and Leyden, the name of the *Rhine*. This was formerly the principal mouth, emptying into the sea at Catwyk; but, after the fearful inundation in 860, which probably threw up the greater part of the downs, had filled this arm with sand, the Leck received the great volume of water, and the *Old Rhine*, as it was called, became an inland canal, without any considerable current. To drain the circle of Rhynland of its superfluous waters, it was contemplated, more than two centuries ago, to restore the old mouth of the Rhine at Catwyk; but this difficult undertaking was first commenced in 1804, and successfully finished in three years. North of the Old Rhine, an arm of this river flows into the Zuyder-Zee, under the name of the *Vecht*. After its junction with an arm of the Waal, the Meuse has the name of the *Merwe*, which receives the other arm of the Waal and the Leck, and, after branching out into many outlets, and taking various names, flows into the North sea at Briel, where it has a considerable breadth. After having, for almost two centuries, been closed to navigation, by treaty, the Scheldt, at Antwerp, has borne again, since 1795, on its broad, navigable waters the largest vessels of all nations. At Sandvliet, where its breadth is 6000 yards, it divides into two arms (the East and West Scheldt), which surround Zeeland, and become almost imperceptibly confounded with the North sea. The Ems and Moselle also touch a small part of the country, which is, moreover, intersected by numerous secondary rivers, mostly navigated by boats drawn by horses (*trekschuyts*), and into which the contiguous *Polder* (low tracts of country diked in, and rendered inhabitable by draining) empty their superfluous water by means of hydraulic machinery. In Belgium, the canal from Mons to Condé was opened Nov. 27, 1814. It connects Mons with the Scheldt, and is of importance for the export trade of the Netherlands. The North canal is to unite the Scheldt with the Rhine, and extend from Antwerp, through Venloo and Neuss. The part which is finished connects the Meuse and Scheldt. In 1825, the arm of the sea called the *Axel Gat* was closed by a dam. In 1828, a navigable canal was in progress from the Meuse at Liege to the Moselle at Wasserbillig, which it was intended to complete in six years. By the influx of rivers, especially of the Rhine and Meuse, Guelderland and Holland are exposed to almost annual inundations, which, breaking through or flowing over the dams of the rivers, or dikes, cover whole tracts of country with water and sand, and not unfrequently render them unfruitful for a number of years. Still more dangerous to the seaboard provinces—Holland, Zeeland, Friesland, and Groningen—is the North sea, which is higher than the level of the land. This danger is in part diminished by a series of downs (*Dünen*), 90 to 200 feet high, extending from Dunkirk, in French Flanders, to the Texel. The rest of the sea-coast it is necessary to protect by means of high and expensive dikes, the maintaining of which in repair along the west coast of the Zuyder-Zee and the north coast of the Y, from Wiringerward to Beverwyk, cost, in 55 years (1732—1788), 18,571,000 guilders. In this are not included the dikes of the south and east coast of this gulf, nor those of Groningen, Friesland, Zeeland, and South Holland, with the river dikes. In 1816, 5,000,000 guilders were expended on hydraulic works in those countries. The lowest countries are Groningen, Friesland, Holland, Zeeland, and West Flanders. From France, through Hainault, Namur, and Luxemburg, extends the forest of Ardennes. Limburg also contains some hills, and Brabant, with East Flanders, several elevated forest regions. The middle of the Low Countries is a continuation of the great sandy heaths, extending from the Baltic to the Scheldt, through Brandenburg, Lunenberg, and Westphalia, interrupted by fertile intervals, and then resuming its course through North Brabant. To the south, the *Peel* and *Kempen* land, consisting of heath, sand, and marsh, reaches far into the former bishopric of Liege. The most fruitful regions in grain are Flanders, South Brabant, Zeeland, and Guelderland; in meadows and pasturage, Holland, Friesland, and Groningen. In the more elevated regions in the south-east, and in Brabant, Liege, East Flanders, Guelderland, Utrecht, Overyssel, and Groningen, the climate is very salubrious. On the contrary, in West Flanders, Zeeland, Holland, and Friesland, the instability of the weather, the fogs, the stagnant pools, the bad quality of the water, and the continual use of fish, engender perpetual fevers. Prior to 1788, the United Netherlands never supplied more than one third of their consumption in grain; but, after the decline of commerce compelled the inhabitants to pay more attention to agriculture, which has, besides, been very much promoted by two societies for the improvement of husbandry, the deficiency became comparatively small. Since the union of Belgium, which, in South Brabant, Flanders, and Hainault, produces more than a sufficient supply of excellent wheat, large quantities have been exported to England and Spain. Holland and Overyssel produce rye; Groningen, oats; the northern provinces and Brabant, buck-wheat; the southern provinces, particularly Flanders (which also produces flax of superior quality), rape-seed; Holland, Flanders, and Brabant, hemp; Zeeland, Flanders, and Holland, madder; Utrecht and Guelderland, and some districts of Belgium, tobacco. Fruits and vegetables exist in abundance almost everywhere throughout the kingdom, and especially in the well-watered sections; and garden seeds and roots (especially hyacinth and tulip roots) constitute a considerable article of export to England, Spain, France, Germany, and the other parts of the world. Wine is produced in Luxemburg, not far from the Moselle, and in Liege. The only woodlands are in Luxemburg, Hainault, Liege, and Brabant. The republic of Holland was very destitute of woods, which has been but poorly supplied by the plantation of the soft species, especially those from America. Among the productions of the animal kingdom, the chief are the Dutch cattle. In 1803, there were computed to be more than 900,000 head of black cattle, and 700,000 acres of pasturage in the Batavian republic. Considerable quantities of cattle are also raised in Limburg, and the eastern part of Liege. Friesland, in particular, raises horses which are rarely equalled in size, strength, and endurance. Numerous flocks of sheep are bred in the sandy districts of Brabant and Holland, especially on the island of Texel. The breeding of swine is much pursued, and pork is an important article of subsistence for the lower classes. In the sandy plains near the sea, there are innumerable wild rabbits; other four-footed game is scarce in the northern provinces, but abundant in the wooded provinces of the south,—Brabant, Hainault, Namur, and Luxemburg. Wild and tame fowls, especially water-fowl, exist in great abundance. Bees are raised in considerable quantities on the heaths in Guelderland and Utrecht. In Drenthe are found snakes, but of a harmless kind. The fisheries are one of the branches of subsistence in the Netherlands; and, in 1804, it was calculated that, notwithstanding the war with England, 20,000 families derived subsistence from them in the United Netherlands. The whale and herring fishery seems to be recovering from its decline. The 1500 vessels called *herring busses* employed in 1601 in the herring fishery, had diminished, in 1795—1807, to 30, but, in 1818, had increased again to 157. Oysters and muscles, used for lime, as well as all kinds of fresh and salt-water fish, exist in great abundance on the coast, and in the numerous rivers and inland waters. Of minerals, the northern provinces contain, for the most part, nothing but peat, which is obtained in large quantities in Holland and Friesland, together with argillaceous earth and pipe clay. In the southern provinces, Namur, Hainault, Liege, and Limburg, are found iron, lead and copper, calamine, sulphur, fossil coal, lime, marble, and mineral waters. The Netherlandish manufactures are among the most important in Europe, and furnish almost every thing that pertains to the wants and conveniences of life. The Holland, and especially the Leyden, woollen manufactures, formerly so flourishing, as well as those of Tilborg, in Brabant, have, indeed, very much declined. On the other hand, the manufactures of cloths at Verviers, in Liege of linen, in Flanders of lace, gold and silver stuffs, and hats, in Brabant of cambrics, in Hainault the famous linen bleaching at Haarlem, and the Belgic and Dutch dyeing establishments are still prosperous, and the Brabant lace manufactories alone put many millions of guilders in circulation. The paper, wool, and saw-mills of North Holland, the Holland smoking tobacco, and snuff manufactories, and the brandy distilleries in the provinces of Holland, Brabant, and Liege, which are at present as prosperous as they ever were, together with the tobacco-pipe manufactories at Gouda, are deserving of mention; also the breweries in Brabant and Upper Yssel. Dutch commerce began to flourish in the fourteenth century, at Bruges, in Flanders, but, at the end of the fifteenth century, left this city, in a great measure, for Antwerp, which became the first commercial place in the world. But the devastations of the war of independence with Spain, and the capture of the city, in 1585, drove the richest merchants to the Dutch Netherlands, and especially to Amsterdam, whose commerce, at the end of the sixteenth and the beginning of the seventeenth century, rose to an unparalleled height, from which it declined somewhat about the close of the eighteenth century, till the revolution of 1795 inflicted its death blow, and London, the rival of Amsterdam, rose to be queen of the ocean, on the ruins of Dutch commerce. Since 1813, the commerce of the Netherlands has been much augmented, but it is yet very far from its former extent. In 1818, 3800 vessels sailed from their ports. In 1826, 1606 vessels, exclusive of coasters, entered the harbour of Amsterdam. In 1790, of 9734 vessels which passed the sound, 2009 were Dutch, and 3788 British; in 1796, of 12,113 vessels which pursued that route, 4456 were British, and one Dutch; in 1815, of 8815 vessels, 2398 were British, and 450 Dutch. The commerce of Belgium was destroyed by the decline of Antwerp, and still more by the closing of the Scheldt; and these provinces flourished only by the fertility of their soil, and by the increase of manufactures in the last years of the Austrian government. The opening of the Scheldt, stipulated in the treaty of peace of 1795, and the exertions of the French government to promote the commerce of Belgium at the expense of that of Holland, were of little avail, on account of the continued war with Britain. The treaties of Paris and Vienna, in 1814 and 1815, placed the commercial rights of the Northern and Southern Netherlands on an equal footing. At the present day, the Dutch are the agents of Great Britain for a great part of Germany and Switzerland, in the commerce on the Rhine. They also supply England (mainly by way of Rotterdam) with butter, cheese, flax, grain, and madder, when their importation is permitted. In the trade with France, chiefly through Antwerp, the balance has been, on an average, about 12,000,000 guilders against the Netherlands; but the trade with Spain, Portugal, Italy, and the Levant, is in their favour. The trade with the United States of North America is passive on the part of the Netherlands. The gin and other commodities exported to these states cannot balance the tobacco, hides, &c., imported from America. The Dutch trade to the East and West India colonies has undergone great changes, partly by the loss of Berbice, Demerara, and Essequibo (though, as far as concerns the trade with these colonies, the British government has given the Dutch equal rights with its own citizens), partly by the decline of the East India company, and by the freedom of trade to the East Indies, bestowed on all the subjects of the kingdom (with the exception of the Moluccas and of the trade to Japan, reserved to the government of the Dutch East Indies). The liberal administration of Java has occasioned a great increase in the quantity of its products, of which North America is the chief recipient. The former lucrative contraband trade with Spanish America, by way of Curaçao, has been annihilated by the independence of that country; but, on the other hand, new resources are opened to Dutch trade in Brazil, the Havana, and Hayti. The inland trade of the Netherlands, by the interchange of various productions between the northern and southern provinces, has been highly important. After Amsterdam, the principal commercial places are Antwerp, Rotterdam, Bruges, Brussels, Ghent, Ostend, and Middleburg; the most important ports, Antwerp, Ostend, Briel, Delftshaven, Dortrecht, Enkhuisen, Medemblick, and Ziericksee. There are commercial tribunals at Amsterdam, Groningen, Middleburg, Rotterdam, and Schiedam. April 1, 1804, besides the old bank of Amsterdam, a bank of the United Provinces of the Netherlands, was established for twenty-five years. The capital consisted of 5,000,000 guilders, divided into 5000 shares. Its principal business was the discounting of commercial paper. In 1815, a commercial company was chartered at Amsterdam for twenty-five years, with the exclusive right of prosecuting the tea trade to China. The finances of the United Netherlands during the thirty-two years' peace of 1748—80 were in so prosperous a condition that the public stocks, bearing interest of two and a half per cent. were at an advance of ten per cent. above the nominal value. The war with England, the internal troubles of 1786, the war with France, and its pernicious consequences, produced an annual deficit of full 8,000,000 guilders, besides a new debt of 22,000,000, which, after the conquest of Holland, was increased to a fearful extent; and the interest on the national debt, from 1795 to 1804, increased from 18 to 34, and, subsequently, to 42,000,000; so that, in 1795—1805, it was necessary, in order to cover the yearly deficit, to raise forty-one per cent. on the capital, and fifty-three per cent. on the incomes of the owners of real estate. The consolidation, in 1798, of the provincial debts, which had been previously separated, had but a slight influence in improving the condition of the finances. More beneficial was the system of taxation introduced in 1805, by the pensionary Schimmelpennink; but the expenditures of king Louis, who, in 1807—9, borrowed 9,000,000 to cover the deficit, in conjunction with the invasion of the British, in 1809, reduced the country to so lamentable a state, that, on its incorporation with the French empire, in 1810, Napoleon, by a reduction of the national debt to one third, virtually declared it bankrupt. One third of the debt only was declared to bear interest; but the other two thirds were deferred (*uitgestelde*, not bearing interest). The actual (*Werkelijke*) debt bears an interest of two and a half per cent. from January 1, 1815: 4,000,000 of the latter are to be annually liquidated, and their place supplied by as many of the first. The debt of the former republic of Holland amounted to 573,153,530 guilders; the deferred debt to 1,719,460,591; the whole to 2,292,614,121 guilders. The Austrian debt, incurred by Belgium, by an agreement of October 11, 1815, was fixed at 34,466,679 guilders. In consequence of such a heavy debt, it was necessary, before the incorporation of Belgium, in the first years of the regal sovereignty (1814), when trade had hardly begun to revive, to impose a tax of 63,000,000 on a population of 1,800,000 men, some of whom were in abject poverty, and on a country of whose surface five sixteenths is covered with water, three sixteenths is composed of heaths, sands, wastes, and marshes, and consequently one half only is productive of any profit. If, after the incorporation of Belgium, we rate the direct and indirect taxes at 56,200,000 guilders, it follows that each individual in the kingdom of the Netherlands paid eleven guilders, four stivers; according to others, the tax for the year 1819 amounted to sixteen guilders a head. By the budget of 1818, the expenses of the kingdom, which were afterwards, however, diminished, amounted to 74,000,000 guilders. Of this sum, 2,600,000 guilders were appropriated for the royal household, 1,170,000 for the high colleges, 320,000 for the department of secretary of state, 853,000 for the department of foreign affairs, 3,700,000 for the judiciary department, 2,000,000 for the home department, 325,000 for the department of Protestant worship, and 1,875,000 for that of the Catholic, 1,200,000 for the department of education, the arts and sciences, 25,000,000 for the ministry of finances, 5,500,000 for the ministry of the marine, 22,000,000 for the ministry of war, 4,700,000 for hydraulic works (*Waterstaat*), and 1,657,000 for contingencies. The revenue was derived from direct taxes on land, polls, furniture, doors, windows, and patents; and indirect, on salt, soap, wine, domestic and foreign liquors, beer, vinegar, peat, coal, domestic grain, and from the fees for weighing and measuring; and, moreover, from register's stamp and mortgage fees, from the taxes on inheritances, and on wrought gold and silver. The land tax was levied according to an assessment made in 1805.—The navy, which, in 1652—72, consisted of 66—150 vessels of war of all kinds, was reduced, in 1776, to twenty-five ships of the line, twenty-three frigates, and twenty smaller vessels. In the war of 1781 with England, the number was somewhat increased, so that, in 1792, the navy again consisted of sixty-six ships of the line and frigates, and forty-six smaller vessels. But, by the resignation of a great number of the most able navy officers, in 1795, by the immense losses in Saldana bay and at Kamperduin, and by the surrender of the fleet to the British, in September, 1799, the navy was again almost totally annihilated. Under the French dominion, pretty large squadrons were stationed in the Nieuwe Diep and before Antwerp, of which, by the treaty of Paris, of May 31, 1814, the whole of the first and two thirds of the last were transferred to the Netherlands; so that, in May, 1814, the Dutch navy contained in all thirty vessels of war. In the year 1827, the navy contained seventy-six sail, with 2296 guns, among which were fourteen ships of the line, twenty-two frigates, eight corvettes, and six brigs. The navy list was composed of 270 officers, a lieutenant-admiral, seven vice and eight rear admirals (in Dutch, *Schout by nacht*), a commander with the broad pennant, twenty-eight captains, forty-eight lieutenant-captains, ninety-five first lieutenants, and ninety second lieutenants. Both in the higher and the lower ranks, there are many excellent officers, distinguished for their skill in navigation and naval tactics.—The army, exclusive of the national militia of 25,500 men, which, by royal summons, could be at any time increased to 80—100,000 men, amounted, with the troops in the colonies, to 43,000 men, in sixty-eight battalions of infantry, without the depots, one regiment and eleven battalions for the East and West Indies, four regiments of Swiss, ten garrison companies, a regiment of Nassau light infantry, fourteen battalions of artillery, and a corps of light artillery, a battalion of pontoniers, miners, and sappers, the corps of engineers, three regiments of carabineers, two regiments of light dragoons, three regiments of hussars, a regiment of carabineer militia, and the *maréchaussée*. On the army list, the duke of Wellington, who bears, in the Netherlands, the title of *prince of Waterloo*, stood as field-marshal, the crown-prince as general of the cavalry, prince Frederic as master-general of the ordnance and chief of the artillery, Christian, landgrave of Hesse-Darmstadt, as general of infantry, twenty-eight lieutenant-generals, fifty-four major-generals, and twenty-one aids of the king, and the two princes. The kingdom was divided into six general commands. The military contingent of the southern provinces was sixty-seven men to forty furnished by the northern; and the relative number of their forces in the army was in the proportion of 327 to 200. The number of superior officers from the Belgic provinces was much less than that from the Dutch. The officers and soldiers are well paid. In no country is there proportionately so large a number of fortified places, single fortifications, and extended lines of defence. Respecting the repairing and maintaining of them, a convention was concluded in October, 1815, between Britain and the Dutch government. Britain appropriated for the purpose her share of the French contingent. By the terms of this convention, in the Ardennes, and in Luxemburg, Arlon, Rochefort, and Dinant, were to be placed in a proper state of defence; Namur and Charleroi, changed into fortresses of the first rank, were intended, with Philippeville and Marienburg, to defend the Meuse and Sambre; and Beaumont, Chimay, Mons, Ath, Doornick, Cortryk, Menin, Ypres, Furnes, and Ostend, were to complete this line of defence. Between 1815 and the end of 1825, these works cost 96,000,000 francs, 60,000,000 francs of which were from the French contingent, and £2,000,000 sterling from Great Britain. One hundred millions were still wanted to complete them. For these works, 2000 cannons and 6000 artillerists were necessary.

The foreign possessions of the Netherlands were as follows: (how they have been apportioned between Belgium and Holland, we have not ascertained.)—1. in Asia, the island of Java (partly under the direct government of native princes, tributary to the Netherlands); the Molucca islands, standing under the general government at Batavia, and divided into the three governments of Amboyna, Banda, and Ternate; Macassar, on Celebes, Palembang, on Sumatra. New factories have been established at Borneo, on account of the gold mines. The colonies in Asia amount to 85,500 square miles, with 6,561,700 inhabitants, among whom are 52,700 whites, and 8800 slaves. 2. In Africa, 100 square miles, with 15,000 inhabitants, among whom are 14,700 slaves: in thirteen fortresses and commercial settlements on the coast of Guinea, among which are St George del Mina and Nassau. 3. In America, 10,200 square miles, 90,000 inhabitants, among whom are 5800 whites, and 77,200 slaves,—the colony of Surinam (q. v.), and the West India islands of Curaçao, St Eustatia, and St Martin. All the colonies together form 958,000 square miles, with 6,666,700 inhabitants.

By the *Grondwet* of Aug. 24, 1815, the kingdom was declared a limited constitutional monarchy, the crown hereditary in the house of Orange-Nassau. The king could wear no foreign crown. He enjoyed an annual income of 2,400,000 Dutch guilders from the state treasury. His residences were at the Hague and at Brussels. The crown-prince bore the title of *prince of Orange*, and after the completion of his eighteenth year, enjoyed an annual income of 100,000 guilders, which was doubled after his marriage. The king became of age on the completion of his eighteenth year. With respect to the guardianship of a king under age, if no regulation had been made on the subject by his predecessor, and with respect to the regency, arrangements were made by the states-general; and, till they did so, the council of state exercised the supreme power. The states-general consisted of two chambers. The members of the first, who were appointed for life by the king, and required to be at least forty years old, could not exceed more than sixty, nor less than forty. The second chamber consisted of 110 members, chosen by the provincial estates, which were composed of the three estates of the nobility, citizens, and landed interest. The period of office of one third expired every year, but they could be immediately re-elected. For eligibility, besides an age of at least thirty years, it was requisite that the person to be chosen should be settled in the province which appointed him, and be related to no member of the assembly nearer than in the third degree. The ministers of state had a seat in both chambers, either as ministers (in which case, they had only a right to advise), or as members. The king sent his propositions to the second chamber, which transmitted these for ratification to the first. The states-general had the right of making proposals to the king, in which case the opening of the motion belonged to the second chamber. If a proposed law was rejected, the plan of it was never published, but withdrawn. The king exercised all acts of sovereignty, after the matters had been submitted to the deliberation of the council of state, which consisted of at most twenty-four ordinary members, who, as far as practicable, were taken from all the provinces. With respect to the members extraordinary, every thing was left at the option of the king. The king decided, and announced his decision to the minister of state. He appointed and dismissed the members of the state council and the ministers. To him exclusively belonged the management of the colonies and foreign possessions. He declared war, concluded peace, ratified treaties; but, without the consent of the states-general, he could not, in time of peace, dispose of or change any integral parts of the kingdom and colonies. The king appointed and recalled ambassadors and consuls, commanded the fleet and army, appointed and removed officers; but whatever related to peace and war, was communicated to the states-general. He had the supreme management of the public finances, and had the right of causing coins to be struck with his image. He could grant patents of nobility, and found orders of knighthood. Without his permission, no subject could receive any order, title, or dignity from any foreign prince. In him was vested the pardoning power. In his name alone was justice administered. Every arrest made by the police was immediately reported to the local judge, and the arrested person brought before him within three days. All civil sentences contained the grounds of decision. Each province had a court of justice, a criminal and civil court. To each individual was secured full freedom of religious opinion, and all religious denominations enjoyed equal protection, equal civil and political privileges, and equal claims to all dignities, offices, and employments. All kinds of divine worship were allowed which did not interfere with the public order and security. To the teachers of all religious denominations, their former provision was secured, and to those who had no sufficient income, it was allowed or increased from the public treasury. The king took care that no subject should be interrupted in the free exercise of divine worship, secured to him by the constitution, but, at the same time, that all denominations should keep within the limits of obedience to the laws of the state. No taxes could be imposed for the benefit of the treasury, except by law, and, in assessing them, no privileges were allowed. Foreign troops could be taken into service only after consultation between the king and the states-general. Of the national militia, the fifth part was disbanded in time of peace. It could in no case be sent to the colonies, and not beyond the boundaries of the kingdom, without the consent of the states-general, and even then only in case of emergency, or when, in changes of garrisons, the shortest route passed over a foreign territory. All expenditures for the troops of the kingdom were paid from the public treasury. The quartering and maintaining the soldiers, the transports and supplies, of whatever kind they might be, for the armies and fortresses, could not be imposed on one or more inhabitants or communities. If this was done, in unforeseen cases, the government made it a rule to indemnify them. The produce of the toll on roads, bridges, and locks was exclusively appropriated to the repairing and improvement of roads, bridges, canals, and navigable rivers. Every one was free to make known his sentiments and opinions by means of the press, as a suitable organ for the diffusion of knowledge and the promotion of intelligence; but every one was always responsible to society or individuals, as far as their right might have been violated, for whatever he wrote, printed, published, or disseminated. Respecting alterations of, and additions to, the constitution, the second chamber could never deliberate except when two thirds of the members were present, and could adopt resolutions on these subjects only by a majority of three fourths of those present. During a regency, no alterations could be made in the constitution or order of succession. All the alterations or additions which were resolved upon by the king and states-general, in regard to the constitution, were solemnly proclaimed, and annexed to the instrument. The title of the monarch ran,—*king of the Netherlands, prince of Orange-Nassau, grand-duke of Luxemburg.*

Administration. In the king was vested the whole executive power, and on him depended the management of all state matters. He was assisted by a ministry of state, consisting of the first president of the first court of justice, or of the supreme council of the Netherlands, as minister of justice, of the vice-president of the council of state (the king, by the constitution, being regarded as the president of it), of the heads of the various departments of war, of state, of trade, and of colonial affairs, &c. These officers formed, together, the privy cabinet of the monarch. The second highest authority, to whose discussion all laws and regulations were submitted, was the council of state, whose qualifications were defined in the constitution. A separate commission of three or four of its Catholic members superintended the worship and privileges of the Belgic church. In the late Belgic provinces, nearly the whole population consists of Catholics. In the Dutch provinces, the Calvinists constitute four sevenths, the Catholics two sevenths of the population: the remainder consists of Lutherans, Remonstrants, Jansenists, Anabaptists, Greeks, Armenians, Portuguese and (so called) High German Jews, which last enjoy, in the Netherlands, the rights of citizens. The ecclesiastical affairs of the Calvinists are regulated by councils, whose representatives form classes (so called), of which a certain number constitutes the synod of each province. The French, Walloon, English and Scotch have their distinct regulations. (Respecting the institutions of instruction, see the subsequent divisions of this article, *Language, and Literature, and Schools.*) The code Napoleon has subsisted in the Netherlands, but a commission has been occupied in elaborating a penal code, to be followed by a civil. The question, whether there shall be juries in criminal trials, and whether the proceedings shall be public, divided the Belgians and Dutch; the former maintaining the affirmative, the latter the negative. For a knowledge of the history and statistics of this country, the reader may consult Van der Wynckt's *Histoire des Troubles des Pays-Bas* (2d ed.),—the best work on the period of the French revolution; it has been used by J. J. de Smet, in his *Histoire de la Belgique* (2d ed., Ghent, 1822). See, also, professor Frederic, baron of Reiffenberg's *Resumé de l'Histoire des Pays-Bas* (Brussels, 1827. 2 vols.): the history of the Revolt of the Netherlands, by Schiller (which has been translated into French by the margrave de Chateaugiron (Paris, 1827. 2 vols.); J. J. de Cloet's *Geographie historique, physique et statistique du Roy. des Pays-Bas et de ses Colonies* (Brussels, 1822, 2 vols.); the *Itinéraire du Roy. des Pays-Bas* (Amsterdam, 1827, 2 vols.); and the *Commercial code of the Kingdom of the Netherlands.*

Language, Literature, and Poetry of the Netherlands. The language spoken in the northern part of the late kingdom of the Netherlands, and generally called *Dutch*, is derived from the Old Saxon, from which have also sprung the Anglo-Saxon (of which again the English language is a descendant), the Low German (*Niedersächsisch*, or *Plattdeutsch*), and the Flemish. The Flemish language, it its chief features and radical words, coincides with the Dutch, though it borrows many words from the French. It differs, however, from the Dutch, by a more nasal pronunciation, while that of the Dutch is more guttural. There is, however, in the Netherlands, a dialect totally different from the Dutch; that is, the Walloon, a corruption of the French. In all Flanders, Northern Brabant, and a part of Southern Brabant, the Flemish is the common language. The line of division is in Brussels, where the people of the lower city speak Flemish, in the upper city, Walloon. To the south of Brussels, in the (so called) Walloon Brabant, in Hainault, Namur, Liege, and part of Limburg, the Walloon continues to be the popular language. It is worthy of remark, that, even in that part of Flanders which has been under the French sceptre for a long series of years, the Flemish, nevertheless, is the popular language as far as Dunkirk, while, to this moment, Walloon is spoken in Hainault, Brabant, and particularly in Liege, though so long united to Germany. The dialects of the Low German, spoken in the Netherlands, may be divided into five: 1. the proper Dutch, which, as early as towards the end of the fifteenth century, was elevated to a literary language in the northern provinces; 2. the (so called) Peasant-Frisian (once the literary language of Gysbert Japix), an idiom which is gradually disappearing; 3. the Gelders dialect, or the (so called) Lower Rhenish; 4. the Groningen dialect, to which also belongs the Upper Yssel dialect; and, 5. the Flemish, which has remained the literary language in the southern provinces, though much poorer than the Dutch, and overloaded with all the mongrel words, of which Coornhert, Spiegel, and Hoost have purified the Dutch. As to Belgium, the French sovereignty there of nearly twenty years greatly narrowed the bounds of the Teutonic languages, particularly in the cities, and especially in Brabant. The commencement of the independent development of the Dutch language also marks the beginning of the Dutch literature. As early as towards the end of the fifteenth century, the language was already fixed by numerous translations of the Bible, controversial writings, poems, and popular works. Gansfort and Agricola, in Groningen, were among the first who distinguished themselves as divines and scholars. Erasmus, of Rotterdam, made far greater progress. A still greater genius, Hugo Grotius, in the beginning of the seventeenth century, when science, repressed during the long struggle for liberty, began again to revive, embraced, at the same time, philology and antiquities, poetry, history, philosophy, theology, and jurisprudence in all its branches. The northern provinces were long destitute of a university: that of Louvain, in Brabant, served for all the Low Countries, until king Philip established another at Douai for his Walloon subjects, which, however, after it came under French dominion, declined rapidly. But the university of Leyden, founded in 1575, by prince William I., in order to reward the patriotism of her citizens, displayed in a valiant resistance against the Spaniards, soon exerted a beneficial influence over the whole united Netherlands. Men like Scaliger, Lipsius, Daniel and Nicolas Heinsius, Gronovius, Van Bahrle, Spanheim, and others, in ancient literature; Erpenius and Golius in Arabic; Arminius, Drusius, Coccejus, and others, in divinity; the two Snellius in mathematics,—made this university famous over all Europe. Universities were also founded at Franeker in 1585, at Groningen in 1614, Utrecht in 1636, and Harderwyk in 1647, and their competition with the university of Leyden was very advantageous to science. Towards the end of the seventeenth century, Huygens, Leeuwenhoek, Zwammerdam, Hartsoeker, and others, distinguished themselves in natural history and astronomy. New light was shed on the Oriental, Greek, and Dutch languages; also on medicine, after the peace of Utrecht, by men like Alb. Schultens, Tiberius Hemsterhuis, Lambert Ten Kate, and Hermann Boerhaave; and, under a series of distinguished men who succeeded them, these branches flourished more than ever, particularly at Leyden, which, during the whole of the eighteenth century, was indebted for many distinguished professors to the university of Franeker. Utrecht also had its Wesseling, Duker, Drakenborch, and Saxe. Among the jurisconsults, Mathæi, Huber, Noot, and Voet are distinguished. The cultivation of the Dutch language was especially promoted by grammarians, including, besides the above-mentioned Lambert Ten Kate, Sewels, Zeydelaar, Kramer, and Van Moerbeek. Dictionaries were produced by Kramer, Sewels, Halma, Moerbeek, Weidenbach, and Weiland. In philology, history, geography, mathematics, natural philosophy, and medicine, the Dutch have distinguished themselves in the highest degree by talent, erudition, and diligence, and their contributions to civil and public law are very valuable. The Dutch have always had men of the first distinction in ancient classical literature. Works of this kind, however, cannot be called a national literature, particularly if they are written, as was mostly the case with these, in a foreign language, or by natives of foreign countries. Among the men who shone at Leyden, as stars of the first magnitude, Scaliger and Luzac were born in France, Albinus in Dessau, Vossius in the Palatinate, Gronovius (properly *Grönhof*) in Hamburg; Ruhnken was a Pomeranian, Vorstius a native of Cologne, and the great philologist Wyttenbach was a Swiss. The national literature, properly speaking, of the Dutch, is deficient in originality, because mostly formed on the model of the Germans, English, and French; yet they have produced works which need not shun a comparison with those of other countries. In the seventeenth century, their poetry flourished: their native popular poetry is fine, and other poetical productions are distinguished by power, fulness, and beauty of description and language. From 1640 to 1750, their national theatre was particularly developed, and was carried to a high degree of perfection by several poets of talent. Until 1750, the Dutch theatre was much richer in original pieces than the German; and the Dramas of Van der Gon, Rotgans, Duyf, Lescalje, Benagie, and De Marre were incomparably more beautiful than what the period of Gottsched produced in Germany. Yet many of those Dutch plays are mere imitations of the French. Among the poets who distinguished themselves, are Jan van der Doos (Janus Douza of Norwik, died 1604), who is eminent as a philologist, historian, and Latin poet, here, however, chiefly mentioned as one of the first who attempted poetry in the vernacular tongue, in which Daniel Heinse of Ghent (who died 1655) followed him with great success. Peter Cornelius van Hooft of Amsterdam (who died 1647), esteemed for his histories of king Henry IV., and Belgium, and an excellent translation of Tacitus, was too artificial in his tragedies and other poems, and his language is overloaded; but, in all the poems of James Cats (q. v., who died in 1660), there breathes a true spirit of poetry, a peculiar serenity, wisdom, and piety. The Dutch call him their *Ovid*. The poems of Jan Antonides van der Goes (who died in 1687) have the reputation of correctness and elegance. Joost van der Vondel of Cologne (who died in 1679) wrote metrical translations of the Psalms, of Virgil and Ovid, satires, eulogies, many tragedies, and an epic poem, Adam and Lucifer, and has obtained the fame of a classic poet, among the Dutch. His language, if not always correct, is nervous and rich. Among his tragedies is also a Maria Stuart. A complete collection of these tragedies appeared, in 1720, at Amsterdam, in two volumes. Constantius Huggens (who died in 1687) is celebrated for his epigrams, James Westerbann (who died in 1670) and John Adolphus Dans (who died in 1674) for their erotic poems. Among the poets distinguished for their mirthful vein are John van der Veen (who died 1660) and John Decker (who died 1664.) Luke Rotgans of Amsterdam (who died in 1710) formed himself on the model of the ancient classics, and his epic poem William III., as well as his tragedies, prove sufficiently what models he strove to imitate. Jan van Broeckhuyzen of Amsterdam (who died 1707), celebrated as a critic and a Latin poet, left also, in the Dutch language, odes, idyls, and other poems. The lyric poems of Arnold Moonen and the idyls of Wellekens should not be forgotten. Hubert Cornelissoon Poot of Abtwout, near Delft (who died in 1733), was a talented, natural poet. Adrian van der Vliet, who, besides biblical poems, wrote a poem,—The Spaniards in Rotterdam (died in 1780),—Piet. Nieuwland (who died in 1794), and several others, are much esteemed. An epic poem, called *Germanicus*, appeared in 1780, by an anonymous authoress. Besides these, we should mention, among the elder poets, Burmann, Smits; and, among the modern, Hieronymus de Bosch, Theod. van Kooten, Klijn, Kleinhoff, Kaldenbach, Bellamy, Nieuwland, Feith (q. v., who died in 1824), Bilderdyk (q. v.), Helmers, Spandow, Van Hall, Tollens, Kilmers (died in 1813), Kinker, Witsen, Gysbeek, and the Portuguese Jew Dacosta. Bilderdyk, at the same time, is a scholar of the first rank. Even from these short notices it will appear, that much effort has been made to adapt the language to elevated purposes; and these efforts have been crowned with much success. No nation has so good a translation of Klopstock's Messiah as the Dutch translation by Groeneveld (Amsterdam, 1784 to 1791, 2 vols.), in hexameters. The prose of the Dutch has, it is true, little euphony and elegance, but it is well adapted to express practical truths in a simple and popular manner. The Dutch prose would, undoubtedly, have acquired greater perfection, if their philosophical and other writers had not often made use of a foreign language. Erasmus, Lipsius, Grotius, Wyttenbach, and others, wrote in Latin, and Francis Hemsterhuys, that amiable Socratic philosopher and tasteful and ingenious writer, in French. As with philosophy, so also with history. The Dutch prose must gain by translations from foreign languages, which are very numerous in modern times. The sciences have flourished in the northern provinces, and kept pace with the progress of the times; but this is not the case in the southern provinces. Instruction in the university of Louvain has not advanced with the time; it has adhered to the dead forms of the middle ages. In this the consequences of the Spanish tyranny, which dreaded the light, have been manifested, and several improvements intended by Joseph II. were openly resisted. The abolition of the university at Louvain, during the French government, and the foundation of the Athenæums at Brussels and Liege, Ghent and Bruges, could not banish the spirit of darkness, which, as late as in 1814, may be thought to have appeared in the joy with which the restoration of the Jesuits was received. Yet there were, in the southern provinces, as well as in the northern, numerous institutions for instruction, at Louvain, Liege, Ghent. Athenæums or gymnasia are found also at Middleburg, Breda, Deventer, Franeker, Harderwyk, and Amsterdam. The kingdom had, in the year 1825, 3889 schools, with 383,970 pupils, and 75,648 schools for the poor, and primary schools. The six universities contained 2636 students; Louvain had the most (580). The northern provinces had the advantage, in gymnasia and schools, over the southern provinces. In Flanders the gymnasia flourish least. Among the institutions for instruction ought to be mentioned the artillery and engineer school of the kingdom, the military school at Delft, the institution for the deaf and dumb at Groningen, the school for naval architecture at Antwerp, the schools of navigation at Antwerp, Amsterdam, and Helvoetsluys. Other scientific institutions are, the museum at Amsterdam (a collection of pictures, drawings, works of sculpture, gems, and antiquities, and a public library): the Netherlandish institute for sciences and arts (*Nederlandsch Institut van Wetenschappen, Letterkunde en schoone Kunsten*), divided into four classes; 1. of sciences; 2. of language; 3. literature and poetry; 4. history and antiquities, and of fine arts. At Leyden there are public libraries, anatomical, surgical, mathematical and philosophical collections: at Haarlem, the society of the sciences (founded in 1752), Teyler's foundation for the promotion of theology, and some other kindred branches; and an agricultural society (*Hollandsche Huishoudelijke Maatschappij*): at Groningen, the society *pro excolendo jure patriæ*, and many other societies. Thus Arnheim, Zütphen, Bergen-op-Zoom, Utrecht, Amsterdam, Enkhuyzen (where a society exists, established by the minister Jan Nieuwenhuyzen, for the education and improvement of the lower classes, and which, in 1810, contained 8000 members), Ziericksee, Breda, Luxemburg, Maestricht, Liege, Brussels, Ghent, &c., contain numerous societies for the promotion of learning, or for practical purposes. Of the transactions of the academy of sciences and arts in Batavia (founded more than fifty years ago), the tenth volume appeared in 1825. The clergy of Holland are unfavourably distinguished by a spirit of intolerance, particularly the Calvinists; and the most intolerant are generally the most esteemed. There are, indeed, honourable exceptions, but such individuals are mostly kept silent by the fear of persecution. It is still worse with the Catholic priests in Belgium. Part of the Lutheran clergy, however, are enlightened men. The most tolerant spirit, and the greatest share of knowledge to be found among the Dutch clergy, fall to the share of the Remonstrants and Mennonites; but, for this very reason, they are hated and despised by their brethren. The study of law and general jurisprudence is in a flourishing condition. The judges and lawyers have a high character. Medicine is well cultivated; but intellectual philosophy is in an exceedingly backward state. Even now, there are many who adhere to the Cartesian system. In mechanics and hydraulics, the Dutch are well known to excel.

Netherlandish School of Painters includes all the painters in the Netherlands who, since the fourteenth and fifteenth centuries, have pursued their art in a style peculiar to that country. It is divided into the *Dutch* and the *Flemish* schools. The Flemish school was founded by John van Eyk (q. v.) (born at Maaseyk, in the fourteenth century), and is distinguished by a brilliant colouring; magic effect of the *chiaro-scuro*; carefully laboured, though often tasteless drawing; a strong, yet natural expression, and boldness in composition. To this school belong Francis Floris (born 1520, died 1570), called the *Flemish Raphael;* John Stradanus (de Straet), of Bruges (born 1536), who painted historical pieces and hunting scenes; Mart. de Vos (born 1520); Spranger (born 1546); Peter and Francis Porbus, father and son; Henry Steenwyk, the painter of perspective (born 1550); Dionysius Calvart (q. v.); the brothers Paul and Matthew Bril; Van Ort (born 1557); Peter Breughel, and his son John; Roland Savery, of Courtray (born in 1576). After all these came Peter Paul Rubens, the boldest painter of modern times; a man of inexhaustible industry, of gigantic imagination and power of representation, to whom about 4000 paintings are ascribed. With him the Flemish school reached its acme. Several distinguished painters follow: Francis Snyders (born 1579), whose hunting pieces excel all others in boldness and truth; Jodocus Momper (born 1580), a landscape painter, esteemed for his valleys, and the distant views which they present; Peter Neefs, the famous church painter; David Teniers, father and son, who, in representing companies of peasants, guard-rooms, taphouses, and all kinds of low-life, have hardly their equal; Gaspar de Crayer (born 1582), who approaches, in the expression and colouring of his historical paintings, to Rubens; Gerard Segers, distinguished as an historical painter; his brother Daniel, famous for flower and insect pieces. James Jordaens (born 1594), however, excelled all those who made Rubens their model. Abraham Janssen, and his pupil Theodore Rombouts (greater than his teacher) equal Rubens in colouring, but not in conception. The industrious Luke van Uden executed the landscapes for Rubens's paintings; and his views of the sky at dawn are worthy the study of every artist. Anthony van Dyk (born 1599) obtained the name of the *king of portrait painters*. He excelled Rubens in correctness and beauty of forms. Cornelius Schut, for whom John Wildens often painted the landscapes, distinguished himself as an historical painter; Adrian Brouwer acquired fame by his excellent representations of scenes from common life; John van der Meer by his pastoral pieces; Anthony Francis van der Meulen by his battle pieces; Francis and John Milet, father and son, by their landscapes. Besides these, we might mention the names of John Bol, Wenceslaus Koeberger, Henry Goltzius, Henry van Balen, Francis Hals, William Nieuwland, James Fouquières, Philip de Champagne, Erasmus Quellin, Abraham Diepenbeck, Theod. van Thulden, John Goeimar, James of Artois, Bonewent Peters, David Kickaert, Gonzalez Coques, Peter Boel, Samuel van Hoogstraaten, John Bapt. Monoyer, Abraham Genoels, Gerard Lairesse, Arnold von Vuez, John Francis van Bloemann, John van Cleef, Pet. Eykens, Richard van Orley, Louis Deyster, Nicolas Largillière, Verendael, Robert van Oudenaerde, John Anthony van der Leepe, Caspar Verbrügen, John van Breda.—The Dutch school is distinguished for a faithful copying of nature, great finish, good *chiaroscuro*, and skilful disposition of colours, and delicate penciling; but it is reproached with choosing often ignoble subjects, and with incorrectness of drawing. Its founder is Luke of Leyden (q. v., born 1494). Its most prominent artists are Octavius van Veen, of Leyden (born 1586, died 1634), who deserves mention, also, as the teacher of Rubens. Abraham Bloemart (q. v.), of Gorcum (died 1647), painted historical subjects, landscapes, and animals, in good taste. Cornelius Poelenburg, of Utrecht (born 1586, died 1663), was peculiarly happy in painting small landscapes, with figures. Worthy pupils of his are Daniel Vertange and John van Haensberge. John Weynants, of Harlem (born 1600) is distinguished as a landscape painter; and John Daniel de Heem, of Utrecht (born 1604, died 1674), for his faithful imitation of flowers, fruits, carpets, vases, &c. The highest place belongs to Rembrandt, whose masterly colouring atones for all his defects, and Hermann Sachtleben (*Zachtleevens*), who painted fine landscapes. In the delineation of common life, the following are distinguished: Gerard Terburg, of Zwoll (born 1608, died 1681); in landscapes, John Both, of Utrecht (born 1610, died 1650); Hermann Swaneveld, of Woerden (born 1620, died 1690). Asselyn (born 1610, died 1680) painted battles, landscapes, and pastoral pieces, with a brilliant colouring and a delicate pencil. But it will be difficult to find any painter who draws more correctly, colours more beautifully, and distributes light more truly, than Gerhard Dow, or Douw (born 1613, died 1680). Peter van Laar was the inventor of the *Bambocciate;* John Fyt (born at Antwerp, 1625) was a good painter of beasts, birds, and fruits; Gabriel Metzu, who worked in the style of Terburg, excelled him in softness of penciling. The landscapes of Benenberg of Utrecht are full of life and freshness. Philip Wouvermann (born 1620, died 1668), the most famous painter of horses, produced battle and hunting pieces, horse-markets, travellers, and robbers; and his paintings, of all kinds, are highly esteemed. His pupil John Griffer painted the beautiful views on the Rhine. The landscapes of Anthony Waterloo, for which Weenix executed the figures, are sometimes cold, but please on account of the accuracy with which he represents light playing through foliage, and the reflection of objects in water. Berghen acquired the name of the *Theocritus of painters;* and perhaps Paul Potter is the only one who can dispute the superiority with him. Whilst Ludolf Backhuysen painted storms at sea with an effect as true as it is terrible, Francis Mieris distinguished himself by fine and accurate representations of many domestic subjects, and John Peter Slingeland was hardly more accurate. Godfrey Schalken, of Dort, has not yet been excelled in the illumination of night scenes. Excellent market scenes, animals, and landscapes were painted by Charles du Jardin. Adrian van de Velde painted landscapes and animals with almost unequalled perfection. For the representations of the beautiful solitudes of nature, James Ruisdael is celebrated, and for quiet, lovely moonlight scenes, Van der Neer. The former is one of the most successful painters that ever attempted to portray nature. No painter has painted more delicately, and with more finish, even in insignificant trifles, than Adrian van der Werf. The flower painter Peter van Hulst, of Dort, is not equal to James van Huysum, who is almost unrivalled in this department. We must also mention Cornelius Ketel, John van Ravestein, John Torrentius, John van Voyen, Anna Maria Schuurmans, Adrian van Ostade, John Booth, Bartholomew van der Helst, Otto Marcellis, John Goedaert, Albert van Everdingen, Henry Rokes, Gerbrandt van den Eekhout, Theodore Helmbreker, James Laveeq, Henry Verschuuring, Mary van Osterwyk, William Kalf, Adrian van der Kabel, Jan Steen, Melchior Hondekoeter, John van der Heyden, E. van der Neer, John Glauber, John van Huchtenburg, Aug. Terwestein, John Verkoolie, Cornelius de Bruyn, Charles de Moor, Francis Peter Verheyden, the two Honbraken, Rachel Ruisch, Cornelius du Sart, Frederic Moucheron, Diedr. Valkenburg, Conrad Noepel, John de Witt, and Cornelius Troost.—It is remarkable that, after a long decline of the art of painting in the Netherlands, it has begun to flourish again in the southern, as well as northern provinces of the kingdom. Among the modern painters, we should mention Van Os, Van Spaendonk, Scheffer, Pienemann, Hoges, Kuipers, Ommegang, Van Brée, Wonder, Schotels. Pienemann's picture, the Battle of Waterloo (eighteen feet wide, and twenty-five high), was bought, by the king, for 40,000 guilders, for the purpose of being presented to the duke of Wellington. Respecting the living artists of the Belgic school, information is to be found in the *Annales du Salon de Gand* (1823). The reproach of an almost exclusive adherence to common reality, has been often made to the whole school of the Netherlands, but is confined by some to the Dutch; whilst the Flemish school, they say, in its more elevated productions, has striven to represent a nobler nature. The chief question in painting, however, is not what the artist attempts, but what he accomplishes; and, if George Forster is right in saying that, in the works of the Flemish painters, we generally miss the spirit of the poet in the beauty of the manual execution, then the Dutch school would deserve the preference, because, though it takes most of its subjects from common reality, it often represents them with a poetic conception of their character. It would be better, however, to describe them both as deficient in ideal beauty, but as distinguished, in the highest degree, for faithful imitation of nature. There would still remain sufficient distinction between the two schools. That they both have great merit in respect to the technical part of the art, has never been doubted; and that they have greater merits, to a much higher degree than is generally allowed them, will be evident from a careful study.

NETSCHER, Gaspar, one of the best painters of his time, was born at Heidelberg, in 1639. His father, John Netscher, a sculptor, died when the subject of this article was quite young. Gaspar was adopted by Tullekens, a physician in Arnheim, near Utrecht. He soon showed his talent for painting, and, at a later period, intended to go to Italy to perfect himself; but he married in Bourdeaux, and returned to Holland. He settled at the Hague; and the necessity of supporting a numerous family obliged him to devote himself to portrait painting and small pieces, though his death of Cleopatra proves that he had talent and inclination to distinguish himself in the higher branches of the art, and to elevate himself above his school. Even in that point which forms the characteristic excellence of the Dutch school,—a faithful imitation of nature, and particularly of the materials of dress—he excelled the Dutch painters. The white satin and velvet, in the drapery of his paintings, and the wool of his carpets, are true almost to deception. His touch is easy and delicate. His smaller cabinet pictures are most highly valued, on account of their finish. In these he represents groups of a few gracefully drawn figures: he is particularly fond of portraying among them one female figure, in white satin. In his historical paintings, he generally selected his subjects from Roman history. He died at the Hague in 1684, and left two sons, Constantine and Theodore (called the *Frenchman*), who were also meritorious painters, but much inferior to their father.

NETTELBECK, Joachim Christian; a man who deserves to be mentioned for his patriotism, his diversified life and perseverance, exhibiting an instance of great firmness and honesty, though there is nothing brilliant in his career. He was born in Colberg (q. v.), in Pomerania, had been a sea captain, and was one of the persons (though then seventy years old) to whom Colberg was greatly indebted for the honour of being the only Prussian fortress not taken by the French, in 1807, in spite of a severe siege. Nettelbeck died in 1824, aged eighty-six years. In his old age he wrote his own life, which appeared in Leipsic, in 3 vols. It is a work of much interest, and we should like to see a good translation of it, as a relief among the many high-flown fictions of the day.

NETTLE (*urtica*); a genus of plants, consisting chiefly of neglected weeds, having opposite or alternate leaves, and inconspicuous flowers, which are disposed in axillary racemes; the fruit is a small seed, surrounded by a persistent calyx; the flowers are monœcious, or, in a few instances, diœcious. The species are mostly herbaceous, and are usually covered with extremely fine, sharp, tubular hairs, placed upon minute vesicles, filled with an acrid and caustic fluid, which, by pressure, is injected into the wounds caused by the sharp-pointed hairs. Hence arises the well-known stinging sensation, when these plants are incautiously handled. In Great Britain this stinging is of but little consequence; but, in some tropical species, it is followed by exceedingly painful and even dangerous effects. The fibre of the *U. dioica*, a common plant in waste places, both in Europe and America, resembles that of the hemp, and may be obtained in the same manner: very fine cloth and paper have been made from it, but hitherto it has not been extensively manufactured. The natives of Kamtschatka make cordage and fishing tackle from a second species; and it is probable, that several others may be employed for similar purposes. More than 120 species of nettle are known, of which four or five only are natives of the United States of America. Among these last is the *U. pumila*, or *rich weed*, remarkable for its smooth and semi-transparent stem.

NEU (German for *new*) occurs in a very great number of geographical names, like the English *new*, Greek *neo*, *nea*, Sclavonian *novy*, Russian *novoi*, and *novaia*, Spanish *nuevo*, and the Danish and Swedish *ny*.

NEUFCHATEL, NEUCHATEL (Neuenburg, or Welschneuburg), a Swiss canton, and sovereign Prussian principality, contains, with the county of Wallengin, 52,000 inhabitants, on 296 square miles, and is bounded by France and Switzerland. After various changes of masters, it came into the hands of the old French family of Longueville, which became extinct in 1707, by the death of Mary of Orleans, duchess of Nemours. The king of Prussia, as heir of the house of Orange, whose claims to the principality were acknowledged, was then called to the sovereignty, by the states of Neufchateau, and his title was confirmed by the treaty of Utrecht. In 1806, Prussia ceded it to France, and the emperor conferred it on marshal Berthier, afterwards prince of Neufchatel-Wagram. By the peace of Paris, it was restored, with additions, to Prussia. The king granted it a constitutional charter, dated from London (January 18, 1814), with the privilege of forming a separate state. In 1822, the principality was received into the Swiss confederacy, as the twenty-second canton, and is the only one which has a monarchical government. Several ridges of the Jura run through the country. The lake of Neufchatel (Neuenburgersee), twenty-eighty miles long by eight broad, is plentifully supplied with fish, and communicates with the Rhine. Grazing is extensively attended to; wine, fruits, hemp, and flax, are produced; the corn raised is not sufficient to supply the wants of the inhabitants. The manufactures are more important; the principal are lace, cotton, and clocks; a considerable trade is also carried on in cutlery, mathematical and philosophical instruments, chintz and other cotton stuffs. The freedom and mildness of the government attract many foreigners. There are about 12,000 watchmakers here, whose instruments are used over all Europe and in America. (See *Chaux-la-Fonds*.) The religion is Protestant (Reformed); there are two Catholic societies. The language is French; but German is also spoken. Half of the revenue (150,000 livres) is applied to the improvement of the condition of the country, and to the expenses of the government. The capital, *Neufchatel*, lies at the foot of the Jura, in a beautiful country, where the noisy Seyon empties itself into the lake of Neufchatel. The town is not badly built, and contains 5600 inhabitants. It is the centre of the trade of the principality. Its institutions for instruction, and other institutions, have been carried to a high degree of perfection, by means of a legacy of 3,000,000 guilders, left by Pury, a merchant, who was a native of Neufchatel, but settled at Lisbon. Pourtales, another merchant, founded an hospital by a legacy of 700,000 francs, which was much increased by his heirs. Neufchatel furnishes 1000 men to the army of the Swiss confederacy. See *Switzerland*.

NEUHOF, Theodore, baron of, king of Corsica, was descended from a noble family in Westphalia. His father, a captain in the guards of the bishop of Munster, died in 1695. Theodore studied in the college of Jesuits, at Münster, at a later period at Cologne, whence he fled to the Hague, after having killed a young man of a distinguished family in a duel. Through the mediation of the Spanish minister, he received a lieutenancy in a Spanish regiment of cavalry, destined to march against the Moors, in Africa. On account of his good behaviour, he was promoted to a captaincy. In a sally from the fortress of Oran, he was made prisoner, and was sent to the dey of Algiers, where he is said to have served, for eighteen years, as an interpreter, and to have been employed in the most secret transactions. When the Corsicans, after several unsuccessful attempts to free themselves from the oppressions of Genoa, resolved, in 1735, to form a government of their own, they applied to the deys of Algiers and Tunis for assistance, who actually sent two regiments of cavalry, under the command of baron Neuhof, with such military stores as the islanders needed. Neuhof was received with great joy, and, in 1736, was crowned king of Corsica with a wreath of laurel. He had silver and copper coins struck, and established an order of knighthood, under the name of the Order of Deliverance. In November, 1736, he left Corsica in order to obtain foreign assistance, and returned, in 1737, with military stores, purchased with the advances which some Dutch houses had made in consideration of the promise of an advantageous commerce, in olive oil, with the island. In 1738, however, French troops again reduced Corsica under the dominion of the Genoese. Theodore had been obliged to flee. In 1741, when the French retired, new troubles arose; but Theodore could not maintain himself against the Genoese and a Corsican opposition. He fled to England. Here his Dutch creditors pursued him, and he was arrested for debt. In 1756, Horace Walpole caused a subscription to be made for him, and thus enabled him to make a settlement with his creditors. But he died of grief, in December of the same year. At the back of St Anne's, Soho, in London, is a stone, erected by the earl of Orford (Walpole), in 1758, with the following inscription:—

Near this place is interred
THEODORE, KING OF CORSICA,
Who died in this Parish
December XI., MDCCLVI.,
Immediately after leaving
The *King's Bench Prison*,
–By the Benefit of the *Act of Insolvency*;
In consequence of which
He *registered his Kingdom of Corsica*
For the Use of his Creditors!

The grave—great teacher—to a level brings
Heroes and beggars, galley-slaves and kings!
But THEODORE this moral learn'd, ere dead;
Fate pour'd its lessons on his living head,
Bestow'd a kingdom, and denied him bread.

NEUKOMM, SIGISMUND, a distinguished German composer, was born July 10, 1778, in Salzburg, and showed, as early as his sixth year, much talent for music. In his 15th year, he was appointed organist of the university in Salzburg, where he continued his studies with great zeal. His father, teacher of calligraphy in the university, took great care of the scientific and musical education of his son. Michael Haydn instructed Neukomm in composition, and often caused him to act for him as first organist to the court. In his eighteenth year, he was appointed *correpetitor* of the opera, at the theatre in Salzburg, on which he resolved to make music his exclusive profession. In 1789, he went to Vienna, where Joseph Haydn received him among his pupils, and treated him like a son. Until 1804, he remained in this situation, after which he was appointed chapel-master and director to the German opera in St Petersburg. A severe disease obliged him to give up this place. In 1807, he was elected a member of the academy of music at Stockholm, and, in 1808, member of the philharmonic society at Petersburg. During his residence in that city, he brought forward several of his compositions, with great applause; but he could not be prevailed upon by his friends, and his master, Jos. Haydn, to publish any of them until 1808. He then went to Paris, in order to study more attentively the higher style of dramatic music, and thence to Rio Janeiro, as composer to the prince of Brazil. In 1824, he returned to Europe, and lived with prince Talleyrand. In 1826, he went to Italy. Among his chief works is his grand *fantasia*, for the whole orchestra,—a work equally bold in conception and perfect in execution, by which he struck out a new path. Three others followed this. Of his church compositions, some of the most distinguished are his Requiem, his *Stabat Mater*, and the cantata *Der Ostermorgen*, by Tiedge. He has, besides, composed many pieces, great and small, among which is the grand opera Alexander; also psalms, cantatas, &c. All his compositions are distinguished by their thoroughness and purity.

NEUROLOGY. See *Anatomy*.

NEUROSES. See *Nervous Diseases*.

NEUSTRIA, in the geography of the middle ages; the western kingdom of the Franks, in the north of France, so called in opposition to *Austrasia* (Austria, Oestreich), the eastern kingdom of the same. The term is derived from the negative particle *ne* (not), and *Austria*. On the death of Clovis (511), his sons divided his territories into two parts, which received these names. Neustria lay between the Meuse, the Loire, and the ocean. See *France*, and *Merovingians*.

NEUTERS. See *Bees*.

NEUTRALITY (from the Latin *neuter*, neither) means, in the law of nations, that state of a nation in which it does not take part, directly or indirectly, in a war between other nations. To maintain itself in this state, a nation is often obliged to assume a threatening position, to be able to repel, in case of necessity, every aggression on the part of either of the belligerents. Such neutrality is termed an *armed neutrality*. From the state of neutrality arise certain rights and obligations towards the belligerents. A neutral nation is allowed to render any services to either of the belligerents, which do not necessarily tend to assist him in carrying on hostilities. It must not send him troops, arms, or ammunition. It cannot refuse to one what it has allowed the other; for instance, the right of marching through its territory, supplies of provisions, &c. With either of the belligerents the neutral nation has the right to conclude treaties, if they are not intended to aid the belligerent in the war, or do not necessarily presuppose a war. As, however, in war, force is the main arbiter, it is most advisable for a neutral power to conclude special treaties of neutrality, in which the rights and duties of the neutral power are settled, as it may be easily imagined that there will be always many disputed points between it and the belligerents. These doubtful points are chiefly the following:—Whether the neutral state can allow the belligerents loans, commerce, and even the right of enlisting troops; what goods are to be considered prohibited; whether they can be seized; whether a passage through its territory is to be permitted to the troops of the belligerents; how the unlawful requisitions of one of the belligerents are to be opposed; what security is to be given on this account; the compensation to be rendered if hostilities are committed in the neutral territory, &c. In maritime wars, the treatment of effects of the enemy on board neutral vessels, or neutral effects on board a hostile vessel, give rise to very important questions. (See *Contraband*.) In former times, the principle was pretty generally admitted, that the ownership of the goods on board of the vessels was the only point to be considered, and not the property of the vessels themselves. The belligerents, therefore, seized merchandise belonging to the enemy on board of neutral vessels; but they restored neutral property seized under the enemy's flag. But the endless investigations which this system caused, as a consequence of it was the searching of neutral vessels, produced, by degrees, a new and totally contrary principle, that the flag protects the cargo (*le navire neutre couvre la cargaison ennemie*, or *le pavillon couvre la marchandise*), so that merchandise of the enemy under a neutral flag was safe, but neutral merchandise under a hostile flag was good prize. This principle, since the middle of the seventeenth century, was adopted, in several treaties, particularly between France and other governments. Great Britain, however, wished to enforce the former principle in the war with her colonies in North America. The empress Catharine of Russia, on the other hand, declared in 1780, that she was willing, if necessary, to enforce by arms the new principle, "free ships, free goods." This principle formed the basis of the system of the armed neutrality, in which France and Spain joined with Russia, and to which also Denmark, Sweden, Holland, Prussia, Austria, Portugal, and Naples acceded by separate conventions with Russia. Britain opposed it; yet she was obliged, several times, tacitly to admit the principle. In the French revolutionary war, and the hostilities between Britain and Napoleon, the former returned entirely to the old principle. (See *Continental System*.) Since the peace of Paris, this point has remained unsettled. It came up again in the privateer wars of Colombia and the Greeks.—Respecting the armed neutrality of 1780, of which count Bernstorff probably suggested the first idea, see *Mémoire sur le Neutralité armée*, &c., *par le Comte de Gortz* (Basle, 1821); Tooke's *Life of Catharine II.* (vol. ii.); Dohm's *Materialien fur Statistik* (6 vols. 1782), and *Denkwurdigkeiten meiner Zeit* (1815, 2 vols.).—During the recent struggle between Poland and Russia, when Prussia was obliged to make an explanation respecting the assistance which she gave to the Russians, by allowing them to retreat to her territory, without disarming them, and to obtain provision, &c., from the same quarter, the Prussian government declared that it was not in a state of neutrality as to the two belligerents, but in a state of non-activity. This state of non-activity, however, allowed her to prevent the passage of money sent from Britain to the Poles through her territory; also to stop the couriers of other powers, and to disarm the Poles who had entered her limits. For the principle of armed intervention, see *Intervention*.

NEUTRALIZATION, in chemistry, may be thus explained: if we take a given quantity of sulphuric acid diluted with water, and add it slowly to the solution of soda by little at a time, and examine the mixture after every addition, we shall find that, for a considerable time, it will exhibit the properties of an acid, reddening vegetable blues, and having a taste perceptibly sour; but these acid properties gradually diminish after every addition of the alkaline solution, and at last disappear altogether. If we still continue to add the soda, the mixture gradually acquires alkaline properties, converting vegetable blues to green, and manifesting a urinous taste. These properties become stronger and stronger, the greater the quantity of the soda is which is added. Thus it appears, that when sulphuric acid and soda are mixed together, the properties either of the one or the other preponderate, according to the properties of each; but there are certain proportions, according to which, when they are combined, they mutually destroy or disguise the properties of each other, so that neither predominates, or rather so that both disappear. When substances thus mutually disguise each other's properties, they are said to *neutralize* one another. This property is common to a great number of bodies; but it manifests itself most strongly, and was first observed, in the acids, alkalies, and earths. Hence the salts which are combinations of these different bodies, received long ago the name of *neutral salts*.

NEUTRAL SALTS. See *Salts*.

NEUWIED, PRINCE MAXIMILIAN ALEXANDER PHILIP, born September 23, 1782, brother to the reigning prince Augustus of Wied-Neuwied. Alexander von Humboldt's fame inspired him to distinguish himself likewise by the observation of nature. He went, in 1813, to England, and thence to Brazil. In 1815, he left Rio Janeiro, with two other Germans, Fellow and Freyreiss, and some armed companions, and went to Cabo Frio, thence to Villa St Salvador dos Campos dos Goaytacasas, nearer the sea. On the Rio-Doce he became acquainted with the warlike Botocudes, of whom he is the first who has given accurate information. In 1816, he proceeded to Villa Viçoza. On his way to Sta. Cruz and Villa Belmonte, he touched upon Jauassema, where traces of an extinct race of men are to be found. His desire to visit less known countries induced him to go as far as the frontiers of Minas Geraes. Through almost impenetrable woods, his company made their way with the axe to Villa de S. Pedro d'Alcantara, and proceeded again through woods which they left not until they had reached Barra da Vareda. The state of his health induced him to return straight through Sertam to Bahia, where he embarked, May 10, 1817, for Lisbon. The description of his journey (2 vols. 4to, with many engravings and maps, Frankfort on the Maine, 1819) shows with what knowledge and courage he has examined the country along the eastern shore of Brazil, from 13° to 23° S. latitude. He has also published treatises on subjects of natural science in the transactions of the academy of naturalists at Bonn. Of his *Abbildungen zur Naturgeschichte Brasiliens* (Weimar, fol.), the 11th number appeared in 1827. His collections are very numerous and valuable.

NEUWIED; capital and residence of the mediatized prince of Neuwied, in Prussia, on the Rhine, three leagues distant from Coblentz, in a beautiful plain. It contains 4800 inhabitants, and manufactures of various kinds of goods. It is not quite a century old. Its prosperity has been greatly promoted by the free exercise of religion, permitted to all denominations; so that it contains at present Protestants, Catholics, Moravians, Mennonites, Quakers, Jews, &c.

NEVA; a river of Russia, which issues from lake Ladoga, and, after a westerly course of about thirty-five miles, flows into the gulf of Finland, below Petersburg, by three mouths. It is from 300 to 400 yards wide, and ten or fifteen feet deep, and, of course, navigable for vessels of considerable size. It is generally frozen over from October to April. The water is pure, and is used for drinking and cooking, in Petersburg.

NEVADOS DE ILLIMANI, or ILLIMANI; a high mountain belonging to the Andes, in Upper Peru, about fifteen leagues from La Paz. It is one of the richest gold mountains of South America. A little silver has also been discovered there.

NEVIS, or NIEVIS; an island of the West Indies. It is a beautiful spot, and little more than a single mountain, whose base is about twenty-three miles in circumference. That the island was the production of a volcano, is very evident, a crater being visible on the summit, and sulphur frequently discovered in the cavities of the earth. It is well watered, and in general fertile, producing much sugar. The exports are estimated at 877,400 dollars. It belongs to the British, and is divided into five parishes, containing

15,750 inhabitants; 500 white, 250 free people of colour, and 15,000 slaves. It contains one town, Charlestown, which is fortified.

NEW. For names beginning with this adjective not given here, see the articles under the name which follow it. Thus, for New Britain, New Castile, New Caledonia, New Grenada, New Holland, &c., see *Britain, New; Castile, New*, &c.

NEW ALBION. See *Albion*, also *California, New* and *Old*.

NEW AMSTERDAM. See *New York*.

NEW ARCHANGEL, or SITKA; a port and town on the island of Baranov, in King George the Third's Archipelago, on the north-west coast of North America; lat. 57° 30′ N.; chief place of the Russian settlements there. From this place an intercourse is kept up with China and the Marquesas. The commerce is a monopoly in the hands of the Russian North American company, the directors of which are in Petersburg. See *Russia*.

NEWARK; a post-town and capital of Essex county, New Jersey, nine miles west of New York city; population, in 1820, 6507; in 1830, 10,953. It is finely situated on the west side of Passaic river, six or seven miles, by the course of the river, above its mouth, and only two or three in a direct line. It is handsomely built: many of the houses are elegant, and it is one of the most beautiful towns in the United States. It contains a court-house, a jail, two banks, an academy, and five houses of public worship, two for Presbyterians, and for Episcopalians, Baptists, and Methodists, one each. It has extensive manufactures of shoes, leather, coaches, fancy chairs, and cabinet work. The Passaic is navigable to this town for sloops of 80 tons. The cider, so well known by the name of *Newark cider*, is chiefly made in the township of Orange, on the west side of Newark. Morris canal passes through Newark.

NEW BRUNSWICK; a British province of North America, bounded north by Lower Canada and Chaleur bay, east by the gulf of St Lawrence, south by Nova Scotia and the bay of Fundy, and west by Maine. It is divided into 8 counties and 59 parishes. The population, in 1824, was 73,626. We have not been able to obtain an authentic account of the present statistics of this province, and must give only an imperfect description of it. The bay of Fundy, on the south, nearly divides New Brunswick from Nova Scotia. Passamaquoddy bay forms its south-western boundary, the bay of Chaleur its north-western, and the bay of Miramichi indents it on the east. The principal river is the St John's, which is navigable for boats to the Great falls, near the border of Maine, and a further distance of 200 miles above the falls. The other chief rivers are the St Croix, which forms a part of the western boundary, and the Miramichi, which is a considerable river flowing into Miramichi bay. The country is neither mountainous nor level. On the borders of the rivers, and in the interior of the country, there are forests of excellent timber. Great quantities of lumber, and especially of pine timber for ships, are carried down the Miramichi. Much of the land is good for tillage; but only a small portion of it is well cultivated. Lumber and fish are the principal articles of export; and the trade is mostly with Great Britain and the West Indies. The capital of the province is Frederickton. It stands on St John's river, and had, in 1824, with the parish of Frederickton, 1849 inhabitants. There is a college here; and some common schools are patronised by the colonial government. St John's city, at the mouth of the river of the same name, had, in 1824, a population of 8488. It is a flourishing city, and has an extensive and profitable trade. The tides in its harbour, and in other parts of the bay of Fundy, often rise to the height of thirty or forty feet. The other principal towns are St Andrew's, at the mouth of St Croix river, and Miramichi, on the bay of the same name. The chief executive officer of New Brunswick, entitled lieutenant-governor, and the members of the council, twelve in number, and the judges, are appointed by the king. The members of the house of assembly, twenty-six in number, are elected by the people.

NEWBURY; a town in Berkshire, England, fifty-one miles east of Bath, and fifty-six west of London. It is situated on the Kennet, which is made navigable to Reading, and joins the Thames. Near this town were two obstinate battles fought, between the royalists and the forces of the parliament, king Charles being present at both of them; the first September 20, 1643, and the other October 27, 1644. Population, in 1831, 5977.

NEWCASTLE-UNDER-LYNE, a borough-town in Staffordshire, situated on a branch of the river Trent, 150 miles from London. The town is well built, particularly the principal street, which is spacious and well paved, and it has an excellent market-place in the centre; it formerly had four churches, only one of which now remains, the others having suffered considerably during the barons' wars, were never afterwards rebuilt. The clothing trade and a manufactory of hats constitute the chief employment of the inhabitants, and are the principal sources of their wealth, independent of the coal-trade carried on in this district, which is very extensive, and a great quantity of stoneware is said to be made in the vicinity. Population in 1831, 8192.

NEWCASTLE-UPON-TYNE, an important trading town in the county of Northumberland, is situated on the north bank of the river Tyne, about nine miles from its confluence with the German ocean. It is distant from London 273 miles; from Edinburgh 123; from Glasgow 158; and from Carlisle 57. The place upon which it stands formed the eastern termination of the rampart erected by order of the emperor Adrian, A.D. 120, to defend the Roman province from the incursions of the Caledonians; and the town is supposed to have originated from a bridge over the river, built by the same emperor, and called from his family name Pons Ælii. Roman coins and other antiquities have been discovered here at different periods. When the Anglo-Saxons had expelled the Britons from this part of the country, they founded here the kingdom of Bernicia, and on their conversion to Christianity, this place was called Moncaster or Monkchester, from its being the residence of monks, who at length deserted it in consequence of the incursions of the Danes. It subsequently fell into the possession of the Scots, but on the conquest of England by William duke of Normandy, it was recovered, and a castle being erected here by Robert, the eldest son of William I., the name of the place was changed to its present designation. The town appears to have been encompassed with a wall as early as the reign of John, who granted a charter to the inhabitants; but the oldest charter extant is said to be that of Henry III., who, in 1239, bestowed on the townsmen the right of digging in the vicinity for coal and stone. In the reign of Edward I., Newcastle was taken and burned by the Scots, and one of the burgesses was made a prisoner, who, being a rich man, paid his ransom, and on his return home commenced rebuilding the fortifications, to the expense of which he largely contributed, and they were completed by the inhabitants in general, encouraged by the king, who united to the town the hamlet of Pampedon, or Pandon, which was included within the walls. This rampart is said to have been twelve feet high, and eight in thickness, strengthened with several towers, and furnished with seven gates; besides which the place was defended by a wide fosse or ditch. Newcastle, at this early period, had become one of the principal commercial ports of the kingdom; and it appears from authentic documents, that in 1280 the revenues of the town had risen to £200 a year, a considerable sum at that period. This income was chiefly derived from municipal duties on coal, the use of which for fuel did not however become general till long subsequently to this period. In 1346 seventeen ships and 314 mariners were furnished from this port, on the requisition of Edward III., for the siege of Calais. The situation of Newcastle, near the borders of Scotland, exposed it to repeated attacks during the wars between the two kingdoms. On the insurrection of the Scots against the authority of Charles I., they invaded England, and took possession of this place in 1640. This was a prelude to the civil war, during which Newcastle was garrisoned by the royalists, but it was again taken by the Scots, then in alliance with the parliament, after a long siege in 1664.

The town of Newcastle, including those parts without the walls, extends about two miles along the bank of the Tyne, and one mile from the river side towards the north and north-west; the ground being uneven, but rising as it recedes from the river. Many of the houses are built of stone, and the others of brick; the streets near the Tyne, which are the most ancient, are narrow, steep, and irregular; and the buildings on the declivity of the hill are extremely crowded, but many modern improvements have taken place; some of the streets have been widened, and a considerable number of new ones have been erected, especially in the northern and western quarters of the town. Among the principal streets may be reckoned Westgate street, Percy street, Northumberland street, Pilgrim street, Mosley street, and Dean street. Besides the churches, there are several public edifices of importance. The mansion house, or official residence of the mayor, was built in 1691. The trinity house, erected in 1505, consists of a hall, chapel, and apartments for poor brethren, belonging to a society anciently called the Guild, or fraternity of the Blessed Trinity. The exchange and town-court is a noble structure, erected in 1658; but it has since received considerable alterations. The new courts of justice for the county of Northumberland form oblong quadrangles; the ground-floor, partly below the surface of the ground, containing cells for criminals; and on the upper floor are an entrance-hall, grand jury room, law courts, rooms for the judges, &c. The north elevation of this building has a Grecian Doric tetrastyle portico; and the south elevation has a portico also of the Grecian Doric order, copied from the Parthenon at Athens. The assembly rooms, to which are attached a news-room and a library, constitute a handsome and commodious edifice, erected in 1774. The theatre royal, which is a neat and convenient structure, appropriately decorated, was opened in 1788. The bridge over the Tyne was erected in the place of a former bridge, destroyed by the great inundation in November, 1771. On an eminence commanding the town are the remains of the ancient castle. The great tower is about eighty feet high, and sixty-four feet by fifty-four in extent outside the walls, which are fourteen feet in thickness. None of the town gates remain standing, except Newgate, which has been used as the borough prison; but there is a new gaol and house of correction in Carliol street.

Newcastle is distinguished by several institutions for the advancement and diffusion of knowledge, as the literary and philosophical society, established in 1693; the literary, scientific, and mechanical institution, where lectures are delivered on natural philosophy, chemistry, &c.; the society of antiquaries, founded in 1813, a principal object of which is that of forming a collection of archeological curiosities discovered in the counties of Northumberland and Durham; the botanical and horticultural society, Pilgrim street; and the Newcastle institution for promoting the fine arts, in Blackett street. There is a valuable public library at St Nicholas' church, founded by the Rev. Dr Tomlinson; at the infirmary is a medical library; and there are some others.

The importance and prosperity of Newcastle have chiefly originated from the coal trade, for the prosecution of which the town is admirably situated on the bank of a navigable river, and in the midst of one of the most extensive coal-fields in Great Britain, or perhaps any part of the world. Coal is scarcely mentioned in history till after the grant of Henry III. relative to the right of digging for coal in 1239; but thirty-six years after that period, the commerce in this article had become very considerable, and it continued perpetually increasing, notwithstanding the prejudice against using coal for fuel was so great, that in 1306 it was prohibited in London under severe penalties. This prohibition was subsequently removed, and it appears, from Rymer's Fœdera, the trade in coal between Newcastle and London was authorized by government in 1381. In the latter end of the reign of Elizabeth the duty of 4d. a chaldron on coal exported from Newcastle produced annually the sum of £10,000. In 1699 two-thirds of the coal trade of England belonged to this town, whence 300,000 chaldrons a year were sent to the metropolis; and 600 vessels of eighty chaldrons burden each, together with 4500 men, were employed in carrying on this commerce. The quantity of coal shipped from Newcastle in 1791 was 404,367 chaldrons, sent coastwise; and 45,702, over sea; in 1801, 452,092, sent coastwise; and 50,401, over sea; in 1811, 634,371, sent coastwise; and 18,054, over sea; in 1821, 692,321, sent coastwise; and 48,097, over sea; and in 1826, 800,437, sent coastwise; and 62,620, over sea. In 1832, the quantity of chaldrons shipped was 748,348, and the port dues amounted to £7,062. It is proper to observe that the Newcastle chaldron, by which the preceding quantities are estimated, is nearly equal to two chaldrons London measure. Coal is conveyed from the pits to the river side generally by means of railways, and thence carried to the vessels in which it is exported, in keels or long-boats, manned by keelmen.

Besides coal, the exports are cinders, glass, earthenware, cast and wrought iron and steel; pig, sheet, and red and white lead, lead shot, painters' colours, tar, copperas, sal-ammoniac, lamp-black, grindstones, flag-stones, fire-stones, bricks, canvass, soap, &c. The principal articles of import are corn, clover, and other seeds, flax, hemp, linen yarn, wine, spirits, fruit, sugar, tobacco, barilla, butter, cheese, tallow, hides, skins, oak bark, coffee, mahogany, and other woods, staves, tar, iron, &c. &c. The manufactures of Newcastle and its vicinity are numerous and extensive, amongst which the principal are the iron and glass works; the latter being of high importance, and long reckoned so, as contributing an immense duty to the revenue. The founderies, soaperies, breweries, potteries, roperies, sail-cloth manufactories, and tanneries, are very large. Here are, besides, salt, lead, and chemical works; several of the chimneys erected at these works are very lofty, one of them being 257 feet high, and a shot tower, 175 feet high; here are also corn, mustard, and paper mills, malt-kilns; and colour and glue manufactories.

Newcastle has received no fewer than thirty-six royal charters from various successive monarchs, commencing with the one granted by William Rufus, in

1087; the last bestowed by James I. in 1604. Quarter sessions are held before the mayor, recorder, and aldermen, four times a year; the assizes for the county, in March and August; a court of requests monthly, for disposing of claims under forty shillings; a mayor's court, every Monday, for the determining of civil actions between freemen only, and a county court, every fourth Wednesday, before the under sheriff; the other courts are a court of common council, court of guild, and a court of admiralty. Newcastle returns two members to the British parliament. Before the passing of the reform bill, the number of freemen entitled to vote was estimated at about 6,000; but under the new bill that privilege is vested only in the burgesses residing within seven miles of the borough, and the resident householders paying a rent of £10 annually, and upwards.

The four parish churches of Newcastle are respectively dedicated to St Andrew, St Nicholas, All Saints, and St John. St Andrew's church at the top of Newgate street, is the oldest sacred edifice in Newcastle. St Nicholas is a beautiful erection, founded in 1091. All Saints, at the foot of Pilgrim street, is a modern structure, with an elegant spire. St John's church, in Westgate street, is of ancient date, built about the latter end of the thirteenth century. The chapels of ease are, St Ann's, on the new road, subject to All Saints church; and another, dedicated to St Thomas, at Barras bridge: the latter forms a most prominent architectural ornament to the town; it is adorned with a light picturesque tower, 140 feet in height, rising above the surrounding trees. The architecture is of the early English style; it was finished in 1830, from the designs of Mr Dobson, a talented architect of this town. The dissenters here are an exceedingly numerous and influential body; and so great is their preponderance, that out of thirty places of worship, no fewer than twenty-four are occupied by congregations not in connexion with the established church, including those belonging to the church of Scotland, the Roman catholic church, and the society of friends: the others comprise almost every other sect of dissenters.

The public schools are, the royal grammar-school, founded in 1525: several other endowed charity schools, besides those attached to the various places of worship; and there are upwards of twenty Sunday schools, which give instruction to nearly four thousand children.

The market accommodations here are upon a most ample and convenient scale, and the several places allotted for the sale of butchers' meat, corn, fish, and vegetables, are well adapted for the sale and purchase of these various commodities. The market-days are Tuesday and Saturday, and are numerously attended by farmers, graziers, and corn merchants. There are two fairs in the year, viz. on the 28th of August and 29th of October, of nine days' duration each, at which prodigious numbers of horses and all kinds of cattle are brought, and large quantities of woollen cloths. The four parishes of Newcastle-upon-Tyne (including those parts of the parishes of St Andrew's, All Saints', and St John's, which extend beyond the jurisdiction of the town), contained, by the parliamentary returns for 1821, 43,507 inhabitants, and by those for 1831, 55,922 persons.

Gateshead, an ancient borough and parish, comprehended in Chester ward, in the county of Durham, is situated on the southern bank of the Tyne, opposite to Newcastle, a communication with which town is effected by means of a handsome stone bridge. The history and trade of Gateshead is so intimately connected with Newcastle, that, with the exception of its religious establishments, government, and local foundations, little remains to be noticed of the town. By the reform bill, Gateshead was placed in schedule D, which conferred upon it the right of returning one member to the British parliament. Here are several benevolent institutions, alms-houses, and charity schools; and an hospital for thirteen poor brethren, called St James' hospital. A shoe fair is held here in November. The parish of Gateshead (including Gateshead fell), contained, by the returns for 1821, 11,767 inhabitants, and by those for 1831, 15,177.

NEWCOME, William, an English prelate, born in 1729. His father procured him a scholarship at Pembroke college, in the university of Oxford. From this society he removed on a fellowship to Hertford college, of which he became tutor. In 1765, he went to Ireland, in the capacity of chaplain to the lord-lieutenant, the earl of Hertford, and became successively bishop of Dromore, Ossory, and Waterford. In 1795, earl Fitzwilliam, the then viceroy, translated him to the primacy. Archbishop Newcome was the author of a great variety of theological tracts, the principal of which are a Revision of the English Translation of the New Testament (8vo, 2 vols.); an Attempt towards an improved Version of the Book of Ezekiel; a similar attempt with respect to the twelve minor prophets; on the Harmony of the Gospels; an Historical View of the English Translations of the Bible (8vo); on our Lord's conduct as a divine Teacher; a Review of the chief difficulties in the Gospel Account of the Resurrection of our Lord, and on the Duration of our Lord's Ministry. His death took place in 1800.

NEWCOMMEN, Thomas; a practical philosopher, distinguished for his successful efforts towards the improvement of the steam-engine. He was a locksmith at Dartmouth, in Devonshire, towards the close of the seventeenth century; and notwithstanding his humble situation, he engaged in scientific researches, and carried on a correspondence with his celebrated countryman, doctor Robert Hooke, to whom he communicated his projects and inventions. Newcommen, having had his attention excited by the schemes and observations of the marquis of Worcester, the French philosopher Papin, and by captain Savary's proposal to employ the power of steam in draining the mines of Cornwall, conceived the idea of producing a vacuum below the piston of a steam-engine, after it had been raised by the expansive force of the elastic vapour, which he effected by the injection of cold water to condense the vapour. Thus an important step towards the construction of the very powerful instrument in question, appears to have been owing to the ingenuity of Newcommen, who, in conjunction with captain Savary and John Cowley, took out a patent for the invention in 1705. To Watt, of Glasgow, and afterwards of Birmingham, the world is indebted for the extraordinary advances towards perfection, subsequently made in the construction of the steam-engine (q. v.)

NEW ENGLAND. (See the article *England, New*, for a few general remarks on this subject.) In 1606, the portion of North America lying between the 34th and 45th degrees of latitude was divided by James I. into two parts, called North and South Virginia, and granted to two companies. The London company were authorized to make settlements any where between 34° and 41° (see *Virginia*), and the Plymouth company received the same privilege in regard to the country between 38° and 45°. In 1614, captain Smith having examined the coasts of North Virginia, made a map of the country, and presented it to prince Charles, who changed the name to New England. In 1620, a new patent was granted to the Plymouth company, comprehending that part of the country lying between 40° and 48° from N. to S., and extending throughout the main land, from sea to sea, under the name of New England in America. This name has, ever since, continued to be appropriated to the country lying east of New York; and although it has never formed a political whole, yet as the most of the colonies which were planted in it, were founded on the same principles of government, by men of similar political and religious views and character, and have ever been closely associated with each other, and in many respects differed, and still differ, from the other colonies and states, in their institutions and internal organization, we have thought it best to give a connected view of their history, under this general head. The geographical and statistical details will be found under the appropriate heads. The governments of the New England colonies were charter-governments, while those of the other colonies were royal or proprietary; the government and ownership of the country was in the colonists, while, in the other colonies, they were both in the crown or proprietors, or the government was vested in the former, while the property of the colony was in the latter. The New England colonists were Puritans (q. v.),—a party which no less strenuously defended civil than religious liberty; and the events of the middle of the seventeenth century brought out a large number of republicans to join them. The early and general provision for common education, in New England, was another peculiarity of that part of the country. In ten years after the settlement of Massachusetts Bay, Harvard college was established. In 1647, the legislature of that province passed a law, requiring every town with fifty families to provide a school; and a similar law was adopted in Connecticut, in 1660. Provisions of the same nature were made in New Haven and Plymouth. These laws laid the foundation of the New England system of free schools. The organization of the church government is entirely democratical, and the municipal system is, in many respects, peculiar.

The first settlements on the coast of Maine were among the earliest in New England. Martin Pring, an English navigator, visited its shores in the years 1603 and 1606, and obtained some knowledge of its rivers and bays, and of the interior of the country, which he communicated to the patrons of American discovery and colonization. The Plymouth company were, in consequence, led to attempt a settlement at the mouth of the Kennebec, in 1607, which, however, proved abortive, from the occurrence of accidental circumstances of an unfavourable character. One of the most zealous supporters of this enterprise, Sir Ferdinando Gorges, urged his associates to repeat the experiment, but without success. "Finding," says he, "I could no longer be seconded by others, I became an owner of a ship myself, fit for that employment, and, under colour of fishing and trade, I got a master and company for her, to which I sent Vines and others, my own servants, with their provisions, for trade and discovery, appointing them to leave the ship and the ship's company to follow their business in the usual place." After continuing this private course of discovery several years, Gorges, conjointly with Mason, in 1622, obtained from the council of Plymouth (of which they both were members), a grant of the territory lying between the rivers Merrimac and Kennebec. The next year, in connexion with other adventurers, they sent over a number of colonists, who commenced the settlements at the mouth of the Pascataqua. Several patents of inferior extent, comprised within the limits of Gorges and Mason's grant, were issued by the council a few years after. Of these, two were situated at the mouth of Saco river, in 1630, where a permanent colony was planted the same year, under the direction of Richard Vines, one of the patentees, and a former agent of Gorges. The following year, a tract, comprehending the peninsula on which the flourishing town of Portland now stands, was conveyed, by the council, to two merchants of Plymouth (Eng.), who established a trading-house on an island near Portland harbour, and promoted the settlement of the neighbouring coast. The colonists came chiefly from the southwest of England, and were accompanied by clergymen of the established church; whence the settlements found little favour in the eyes of the Massachusetts planters. Farther eastward, without the limits of Gorges, was the Pemaquid patent, issued in 1631, to several persons belonging to Bristol, one of whom was the mayor of that city. This tract, lying about thirty miles east of the Kennebec, had been the subject of an Indian conveyance in 1625, at which date its settlement was commenced. Pemaquid (now Bristol) must be regarded, therefore, as the oldest permanent settlement in Maine. In 1635, the council conveyed to Gorges a separate title to the portion of the former grant east of the Pascataqua, having previously confirmed Mason in the possession of the western part, from whom it had received the name of New Hampshire. Gorges, in like manner, conferred the name of New Somersetshire on his grant, in compliment to the county of his birth, and took immediate measures for organizing a government. Captain William Gorges came over for this purpose, with commissions to several gentlemen resident in the province, seven of whom assembled at Saco, March 25, 1636, received from the inhabitants an acknowledgment of the proprietor's jurisdiction, and attended, for some days, to the hearing of cases in dispute, besides exercising a cognizance of criminal offences. For some reason, there appears not to have been a perfect acquiescence on the part of all the people under this early administration; for, the following year, governor Winthrop and others, of Massachusetts, received authority from Gorges, "to govern his province of New Somersetshire, and withal to oversee his servants and private affairs." It is not improbable, however, that this commission resulted from the artful and false representations of a malcontent, who had gone to England with complaints of the commissioners, and returned with this order, which the Massachusetts magistrates wisely disregarded. On obtaining a royal charter, confirming the grant of the council, and conferring the powers of lord palatine, as exercised by the bishop of Durham, upon himself, Gorges appointed a new board of counsellors for the government of his province, the name of which was now changed to Maine. The first general court, under this charter, was held at Saco, June 25, 1640, at which the inhabitants of the several plantations, being summoned, appeared, and renewed their oath of allegiance to the lord proprietor. The arrival of Thomas Gorges, Esq., with the commission of governor, occurred the same year. He presided at the second session of the court, in September, and took up his residence at the city of Gorgeana (now the town of York), of which he was likewise mayor. In the mean time, the progress of the civil war in England was becoming ruinous to those who adhered to the side of the crown; and Sir Ferdinando, in common with other royalists, found himself unable to breast the storm. Being taken prisoner, on the surrender of Bristol to the parliamentary forces, in 1645, he soon after died, at an advanced age, leaving his estate to his son, John Gorges, Esq. The governor returned to England in 1643, and was succeeded in his office by Mr Vines, during whose brief administration a title to a large portion of the province, called the Plough Patent, which had been granted by the council of Plymouth, in 1630, was revived by colonel Alexander

Rigby, a member of the long-parliament, from Lancashire, who had purchased it from the patentees. This claim embraced a tract forty miles square, in the most settled part of the province, and respected not only the soil, but also the jurisdiction of the towns comprehended within its limits. Colonel Rigby sent over, as his agent and deputy-governor, Mr George Cleaves, who had been long a resident in the province, and was probably the cause of the resuscitation of this obsolete title. Cleaves summoned a court at Gasco (now Portland), in 1644, in the name of Rigby, as "lord proprietor and president of the province of Lygonia," as the Plough Patent was denominated by its new proprietor. The inhabitants seem generally to have opposed the pretensions of Rigby; but Mr Vines, yielding to the storm, and gaining no intelligence from Gorges, resigned his commission, and removed, with his family, to the island of Barbadoes, to which great numbers of royalists flocked, at that period. Soon after (in 1646), the claims of Rigby were recognised by the commissioners for foreign plantations, in England, and the government of Lygonia became regularly established. The small number of towns and plantations remaining within the limits of Maine, as now restricted, elected Edw. Godfrey, Esq., of Gorgeana, their governor; and, in 1650, fearing they should fall into the hands of the Puritan colonies, petitioned parliament to constitute them a distinct jurisdiction, "a part of the commonwealth of England, that they and their posterity might enjoy the immunities and privileges of freeborn Englishmen," but without success. Their apprehensions were soon realised: in 1652, the colony of Massachusetts Bay laid claim to the greater part of Maine, under the pretence that it was embraced within the limits of their patent, and proceeded to exercise jurisdiction over the towns, notwithstanding the well-founded and manly protests of governor Godfrey. Lygonia, likewise, being left, by the death of Rigby, in a defenceless condition, was brought within the Massachusetts charter, although its towns were not all reduced to submission until 1658. The royal commissioners, who were sent to New England soon after the restoration of Charles II., visited Maine in the summer of 1665, and issued a proclamation, declaring the province to be under the protection and government of the king, and designating several gentlemen as magistrates for the administration of affairs, until the further pleasure of the crown should be known. Scarcely, however, had the commissioners left New England, before the authorities of Massachusetts, with the aid of a military force, resumed their sway in the province, to which the inhabitants were compelled to yield an unwilling submission. The legal proprietor, F. Gorges, Esq., a grandson of the original patentee, at length succeeded in obtaining a restitution of his title, by a formal adjudication at the palace of Whitehall, where agents appeared on the part of Massachusetts Bay, in obedience to a royal order; but, unwilling to renounce her hold upon the province, the colony had instructed her agents to purchase the title from Gorges, in case the decision was in his favour; and accordingly, contrary to the wishes of the inhabitants, and not without exciting the displeasure of the crown, the proprietor was induced to part with his title to the province for the sum of £1250. This transaction took place March 15, 1677—8. After the purchase, instead of continuing possession under the colour of a right derived from their patent, the governor and council of Massachusetts Bay, by a proclamation addressed to the freeholders of the province of Maine, dated at York, March 17, 1679—80, declared themselves to be the lawful assigns of Sir F. Gorges, Kt., and, "to the end that the above-named province might be protected in the enjoyment of their just rights and privileges, according to the rules of his majesty's royal charter, granted unto the above-named Sir F. Gorges, Kt.," proceeded to organize a provincial jurisdiction. The government established at that time was composed of a president, a deputy-president, an assistant, eight justices, and an elective general court, which continued to be exercised, with the exception of the period of Andros's administration over New England, until 1692, when, by the new charter of Massachusetts, Maine was constituted a county, with the name of York, or Yorkshire. This arrangement lasted, without any change, till 1760, when the counties of Cumberland and Lincoln were incorporated, and the county of York was reduced to nearly its present limits. After the independence of the colonies was established, Maine was styled a district, although its connexion with Massachusetts remained the same, until it was erected into an independent state, in 1820. The extent of the province of Gorges was probably about one third of the territory of the state, the other portions being derived to Massachusetts by the charter of 1692. The ancient settlement of Pemaquid (now Bristol), long regarded as the *ultima Thule* of New England, was almost the only post of importance, east of the Kennebec, before that date. The French province of Acadie, so indefinite in its original asserted limits, was finally restricted, on the west, to the river Pemaquid; but even this reduced demand of territory was resisted by the English government; and, in the year 1664, the country from Pemaquid to the river St Croix was included in the well-known patent of Charles II. to his brother, the duke of York (afterwards James II.) This part of Maine was thus united, in its government, with New York, and received the name of the county of Cornwall. A strong fortress was built at Pemaquid, for the protection of the inhabitants; and considerable numbers of emigrants, encouraged by the governors of New York, established themselves on different points of the coast. The settlements were chiefly about the river Sheepscot; but the ravages of the Indians prevented their growth, and finally occasioned the total dispersion of the inhabitants, for a considerable period. The duke of York's title ceased on his dethronement as king of England; and, as already stated, the charter of king William vested the territory in Massachusetts. After the termination of Indian hostilities, and the reduction of Canada, these lands were again taken up by numerous settlers, and, from that period to the present, this portion of Maine has been constantly advancing in improvement and cultivation, notwithstanding the perplexities and serious difficulties, occasioned, for a long time, by conflicting and unsettled titles to the right of the soil. Such is a brief view of the civil history of Maine, concerning which the little information to be gleaned from writers on New England, is lamentably defective in accuracy, as well as amount. A personal and careful inspection of unpublished records and documents, enables the writer to speak of this subject with confidence.

The next colony was that of Plymouth, founded by a small body of Puritans, who had left England in 1608, on account of the persecutions to which they were there exposed, and taken refuge in Holland. During a residence of eleven years in Leyden, their number was increased by other emigrants from England; and, finding themselves subject to many inconveniences, on account of their ignorance of the language and aversion to the manners of the Dutch, they determined to remove to America. They accordingly obtained a patent from the South Virginia company, and chartered two small vessels, in one of which they sailed from Delfthaven July 22, 1620, and joined the other at Southampton. After being repeatedly obliged to put in to land, on account of the leaky condition of one of the vessels, they finally set sail from Plymouth (September 6) with only one vessel, the Mayflower, and, November 9, made the land at cape Cod. Finding that they were without the limits of the South Virginia patent, destitute of any right to the soil, and without any powers of government, they entered into a voluntary compact, as follows: "We, &c., do, by these presents, solemnly and mutually, in the presence of God and of one another, covenant and combine ourselves together, into a civil body politic, for our better ordering, and preservation, and furtherance of the ends aforesaid; and, by virtue hereof, to enact, constitute, and frame such just and equal laws, ordinances, acts, constitutions, and offices, from time to time, as shall be thought most meet and convenient for the general good of the colony; unto which we promise all due submission and obedience." This is the earliest American constitution, and is dated November 11, 1620, and signed by 41 persons. The whole company, including women and children, amounted to 101. They then proceeded to examine the coast, and finally determined to settle at a place to which they gave the name of Plymouth (q. v.). They landed here December 11 (O. S.). Cast upon an unknown shore, in a severe climate, at an inclement season; exhausted by the fatigues of the sea, and suffering from a want of suitable provisions and shelter, nearly one half of their number died within four months after their landing. At times, only six or seven were fit for duty. Before they left England, they had formed a connexion with certain merchants, for seven years, by which they were bound to carry on all their commerce in common. At the end of seven years, the shares were bought in by the colonists, and the joint property divided among them. The government was administered by a governor, chosen annually by the people, and seven persons, called *assistants*, elected in the same way. It was, at first, a pure democracy, and the whole body of the people often met and decided upon executive as well as legislative affairs. But, in 1639, a house of representatives was established. The political affairs of this colony are connected with those of the others, particularly of Massachusetts, with which it was incorporated in 1792.

The colony of Massachusetts Bay, which, as we have already seen, swallowed up several of the other colonies, and from which those of Connecticut and Providence also originated, always acted a leading part in New England. In 1628, the Plymouth company granted to a number of individuals that part of New England lying three miles south of Charles river, and at the same distance north of the Merrimac, and extending from the Atlantic to the South sea. Powers of government were given them the next year, by Charles I., as the governor and company of Massachusetts Bay in New England. The company were authorized to elect a governor and eighteen assistants annually, and required to hold four Great and General Courts annually, which were empowered to make laws and regulations for the government of the colony. A settlement was immediately made, under this charter, at Salem (q. v.), in 1628; and, in 1630, 1500 persons arrived at Charlestown, who soon after settled at Boston, and in the vicinity. These last named individuals received permission from the company to transfer the charter and government to New England; and thus what had been intended merely as the organization of a company, became the constitution of a state. The government was, at first, administered by the governor and assistants; but, in 1634, the people claimed a participation in it, and declared that the General Court (the name which the two legislative houses still bear in Massachusetts) alone had power to make laws, impose taxes, and appoint officers. This, therefore, became a fundamental part of the constitution. The assistants and the deputies of the people at first met in the same room, and the former claimed a negative on the acts of the latter. The disputes to which this subject gave rise were not settled until 1644, when it was determined that the legislature should consist of two separate bodies, each having a negative on the other. Although the charter gave no judicial authority, this power was assumed, and courts of justice created, and, in criminal cases, the Mosaic law was mainly followed.

The first colonists of Connecticut went from Massachusetts in 1635, and were governed by persons called *magistrates*, who were empowered, for that purpose, by the legislature of Massachusetts. But being out of the limits of the Massachusetts charter, they established (1639) a constitution for themselves. The colony then consisted of 800 persons, in the three towns of Hartford, Wethersfield, and Windsor. The substance of this constitution was contained in the charter granted by Charles II., in 1662, and continued, without any material alteration, to be the fundamental law of the state until 1818. New Haven, which now constitutes a part of Connecticut, was settled in 1647, by a company of Puritans, who, having no powers of government, and no right to the land, except by agreements with the natives, also constituted themselves into a body politic, and established a form of government. This colony was included in Connecticut by the charter of 1662.

In 1634, Roger Williams (q. v.), a minister at Salem, was banished from Massachusetts, on account of his religious opinions. With a few followers he fixed himself at Providence. A few years afterwards, Mrs Hutchinson, and some other persons, also banished from Massachusetts for religious differences, purchased of the Indians (1638) the island now called Rhode Island (q. v.); and thus two new communities, with distinct governments were formed. The members of both of them made civil compacts among themselves, in the same manner as had been done by other colonies. In 1644, Williams obtained a charter of incorporation, from the commissioners of plantations (created in 1643), for the inhabitants of the towns of Newport, Portsmouth, and Providence, under the name of the *Providence Plantations*, with full power to rule themselves, under such a form of government as they should adopt. In 1663, they received a new charter from Charles II. In 1643, the colonies of Massachusetts, New Plymouth, Connecticut, and New Haven, formed a confederacy, under the name of the *United Colonies of New England*, which lasted about forty years, until they were deprived of their charters by James II. By the articles of confederation, they entered into a perpetual league of friendship and amity, for offence and defence, each colony retaining its own government and jurisdiction, in domestic concerns. Two commissioners of each of the confederates formed a board for managing the common affairs of the confederacy. During the ascendency of the parliamentary party and the protectorate of Cromwell, the New England colonies were particularly favoured; but, on the restoration, they began to be viewed with an evil eye, and, in 1664, royal commissioners were appointed to visit them, and hear and decide all complaints and appeals, civil, criminal, and military, according to their discretion. But the colonies were, as Lord Clarendon expressed it, already hardened into republics, and the commissioners found themselves unable to execute their powers. The crown still persevered in its arbitrary measures, and, in the last years of Charles II. and the first of James II. (1684—1687), declared the colonial charters forfeited, and their liberties seized into the king's hands. Sir Edmund Andros was appointed governor-general of New England (1686), with instructions to allow no printing-press. The next year he marched, at the head of a body of troops, to seize the charter of Connecticut: the assembly convened, and the charter was brought out into the room, where they met to confer with Andros; the conference was prolonged till night, when the people rushed into the room, extinguished the lights, and secreted the charter in an oak tree, which is still shown in Hartford (q. v.). The inhabitants, in many places, refused to pay the taxes; and, some rumour of the landing of the prince of Orange in England (see *William III.*) having reached America, the people of Boston (April 18, 1689) and neighbourhood appeared in arms, seized the governor and the captain of a frigate in the harbour, compelled the castle to surrender, and thus effected a complete revolution. Delegates from the towns soon after assembled, and voted to resume the government according to charter rights. Connecticut and Rhode Island resumed their charters; but although the people of Massachusetts petitioned for the restoration of theirs, their petition was refused; and, in 1692, a new one was granted, by which the appointment of the governor was vested in the crown. The colonies had been repeatedly involved in hostilities with the different Indian tribes; but the most destructive war took place in 1675—1676, when Metacom (Philip), the most formidable enemy they had met with, by his cunning, his boldness and activity, formed an extensive combination of hitherto hostile tribes, with the purpose of extirpating the English. His death in 1676, after several defeats, was a fatal blow to the power of the natives in New England. The wars between England and France, from 1690 to 1713, subjected the colonies to the attacks of the French, then in possession of Canada, and their allies, the Indians, and, for nearly twenty-five years, a large portion of the inhabitants were in the field, or obliged to guard their possessions at home: their resources were diminished; the fields uncultivated; their villages burned, and their growth checked. After the restoration of peace, they had to contend with the restrictions imposed on their trade and manufactures, and constant attempts to encroach on their liberties, by the mother country. Yet the cheapness and plenty of land, the industry, activity, frugality, and intelligence of the inhabitants, and the freedom of their constitutions of government, rapidly promoted their increase in wealth and numbers. The population, which, in 1700, was about 120,000, was nearly 400,000 in 1750. The seven years' war, (1756—1763), which terminated in the destruction of the French power in America, and secured to Great Britain all the country east of the Mississippi, was an important era in the history of the colonies. From that time began a new system of colonial policy in England, which led to the American revolution. As all of the colonies were equally interested in these events, and became more closely united in their common opposition to the mother country, it is unnecessary to give, here, a detailed account of the measures adopted, and the events which ensued from them, since they would be little more than a repetition of what is given in the article *United States*. (For the history of Vermont, see *Vermont*, and *New York*.) The six New England states have, by the census of 1830, a population of 1,954,611.

NEW FOREST; a large tract in England, in Hampshire, about fifty miles in circuit, which contained many populous towns and villages, and thirty-six mother churches, till it was laid waste and turned into a forest by William the Conqueror. King Henry VIIIth built some castles in it, and it has now several towns and villages. It is situated in that part of Hampshire which is bounded east by Southampton river, and south by the British channel. This is the only forest which belongs to the crown, of which the origin is known.

NEWFOUNDLAND; an island in the North Atlantic ocean, separated from the continent of North America by the straits of Belle Isle and the gulf of St Lawrence, first discovered by Sebastian Cabot, in 1497. It is of a triangular form, 380 miles in length, and varying in breadth from 50 to 300 miles, and, without including the windings of the coast, is 900 miles in circumference; lon. 52° to 59° 40′ W.; lat. 46° 45′ to 51° 46′ N. The head-lands, as well as the general line of the sea-coast, are high and bold, and form numerous secure and commodious harbours. Of the interior little is known, since, with one or two exceptions, it has never been traversed except by the aborigines of the country. Several high hills, supposed to be near the centre of the island, may be discerned from the sea; but the inland country is represented as generally level. It is covered with heath, and a species of dwarf fir and spruce, except on the margin of the rivers and lakes, where various trees grow to a considerable height. The island is on all sides indented by spacious bays, which extend far up into the country, and upon the harbours and coves of which are the stations and settlements whence the fisheries are carried on. The most extensive are White, Notre Dame, Bona Vista, Trinity, Conception, St Mary, Placentia, Fortune, and St George's bays. A large section of the sea-coast, comprehending the northern end and western side, has been ceded to the French, who also possess the small islands of St Pierre and Miquelon, which are situated in the entrance of Fortune bay. The climate of Newfoundland is generally represented as excessively severe, but this is by no means true. The winter usually commences about the middle of December, and the weather continues cold until March, but not so severe as in Canada and other portions of the main land several degrees farther south. In the spring, large masses of ice are brought by the currents from the north seas, and frequently block up the bays and harbours; and in the midst of summer, icebergs, or mountains of ice, may occasionally be seen. The climate is, in consequence, very variable, and vegetation seldom commences before the month of May. Such is its rapidity, however, that many kinds of vegetables are produced in perfection; and, although agriculture has, until of late years, been almost entirely neglected, yet experiments have proved that the soil is capable of cultivation, and that the climate will mature oats, barley, wheat, and almost every thing necessary for the subsistence of the inhabitants. For their principal supplies of corn and other provisions, however, they are, and must, in a great measure, remain dependent upon other countries. This island has always been famous for the cod fisheries which have been carried on upon its shores and banks. These were first prosecuted by merchants and adventurers from the West of England, who used to resort to Newfoundland in the spring, lay up their ships, pursue the fishery until the season was ended, and then return to their homes upon the approach of winter. The value and importance of these fisheries induced these adventurers to seek for a monopoly; and they accordingly procured several acts of parliament to be passed, by which their interests were exclusively protected. The objects of these acts was, mainly, to prevent any permanent settlement being made upon the coast, the whole of which was dedicated to the purposes of the fishery, and the cultivation of the soil or cutting of wood within six miles of the sea, was expressly prohibited. Notwithstanding these statutes, however, settlements were made, which have progressively increased to such an extent that the island can now boast of a resident population of 80,000 souls. The British government, seeing the impolicy, as well as the impossibility, of preventing settlements, have repealed all the old prohibitory statutes, and directed the lands to be granted. The cod fishery is now principally carried on by the planters and coasters, in small boats from the shore; though many larger vessels are still employed upon the bank and along the coast of Labrador, which is a dependency of the government of Newfoundland. This fishery commences in April or May, and continues until the end of October. The number of inhabitants engaged in it is about 25,000. The fishery carried on by the French is transitory. The fishing ships from Brest, St Maloes, and other ports, rendezvous at St Pierres, or at Croque (a station on the east side of Newfoundland), and, after the end of the season, return to France for the winter. The cod fishery has much declined, but another, now of much greater value, has lately engaged the attention of the inhabitants: this is the seal fishery.—The fields of ice, which are annually swept by the currents from the Polar seas, are carried along the eastern coast of the island, and bring with them myriads of seals. The vessels engaged in this fishery are from fifty to two hundred tons burthen, carrying from fifteen to forty men. They are fitted out from St John's, Harbour Seau, Carbonear, and other ports, about the first of March, and proceed to sea until they meet the ice. The vessels are then forced as far as possible into the fields, and the crews disperse on all sides in search of the seals, which are very inactive and easily taken. These animals are valuable only for the fat and skin, which are stripped off from the body with great facility. There are several species. About 500 sail of vessels and 10,000 men are engaged in this fishery, which is over by the end of April. Newfoundland has not yet any local legislature, nor have the people any voice in the government. The laws and statutes of Britain extend to the island, and the executive government is vested in a governor and council. There are courts of criminal and civil jurisdiction, and justice is administered by a chief judge and three assistant judges.

The aborigines of the country are now supposed to be extinct. They were generally called *Red Indians* by the Europeans, from their custom of painting their faces; but they denominated themselves *Beoths*, or the *Beothic* tribe. They are represented as having no resemblance in their appearance, manners, customs, or language, to any of the North American tribes, and they have been supposed to be the descendants of some ancient Scandinavian colony. They were a very harmless, inartificial race, who subsisted upon the deer and other animals which they entrapped in pits and snares. They were formerly very numerous, but their dread of the settlers drove them from the sea-coast into the interior, where they were often unable to procure food. A few years ago, five or six stragglers came to one of the settlements in extreme want, representing themselves as the only remnant of their race. The account they gave was, that, owing to excessive cold and the depth of the snow, they and their brethren were prevented from procuring food, and had set out from their encampment in the hope of reaching the coast, but that the rest had perished by the way. Two of this remnant, only, lived to reach St John's, where the last died in 1828. Since then, the strictest search has been made, but not a trace of the tribe has been discovered.

The trade and commerce of Newfoundland is extensive and valuable. It supplies Portugal, Spain, and the Mediterranean, with fish, and its oil is shipped to Britain. The principal towns are St John's, Harbour Seau, Carbonear, Placentia, and Ferryland. The inhabitants may be reckoned at 80,000; of which one-third are Catholics, and the remainder are Protestants of various denominations. St John's, the capital of Newfoundland, on a bay of the same name, is in lon. 52° 29′ W.; lat. 47° 32′ N.; population, about 12,000. It has one of the best harbours in the island, with from ten to seventeen fathoms of water, up to King's wharf, a mile from the mouth of the harbour. The fish caught on the banks are dried and packed here for Europe. The streets are narrow and dirty, and the buildings generally mean. The government house is a large and handsome building. There is a Roman Catholic chapel, an English Episcopal church, Wesleyan chapel, and Independent meeting-house. St John's is the residence of all the public officers. About 500 troops are generally stationed here. This town has suffered greatly by fires. In February, 1816, a conflagration occasioned great loss; in 1817, November 7, 135 buildings were burned; property destroyed estimated at £500,000; on the 21st of the same month was another great fire; and, in 1818, August 21, a fire again broke out, by which great loss was incurred.

NEW GEORGIA. See *North America.*

NEW GRENADA. See *Grenada, New.*

NEW GUINEA; next to New Holland, the largest island of Australia; between 0° 15′ and 10° S. lat.; and 131° 20′ and 149° 20′ E. lon.; square miles, 275,600; population, 500,000. It is separated from New Holland on the south by Endeavour and Torrey's straits, from New Britain on the east by Dampier's straits, and from Gilolo by Pitt's straits. It was discovered by the Spaniards, in 1528 and 1543, but is still little known. Forrest merely anchored on the northern coast, and Cook landed on the southern shore. Dampier, Carteret, Bougainville, D'Entrecasteaux, only visited some of the neighbouring islands. Le Maire and Schouten, who sailed along the greatest part of the north coast, had several interviews with the natives of the surrounding islands, but did not land upon the main island. On the western coast lie several small islands, which are connected with the Moluccas. The coasts appear to be high and mountainous. In the interior there are some lofty mountains, covered with perpetual snow and volcanoes. In some parts they rise above each other in three successive ranges. Swine, dogs, birds of paradise, parrots, sea fowl, fish, ginger, cloves, nutmegs, cocoa, betel, sago, bread-fruit, bamboo, &c., are found here. The inhabitants are a negro variety; they have projecting lips, a flat, broad nose, a large mouth, large eyes, shining black hair, and a black, rough skin; they are strongly built, and go nearly naked, having only a thin stuff, made of the fibres of the cocoa nut, round their loins. The habitations on the coast are built on piles, with a sort of a bridge, extending above high-water mark; a dwelling of this kind is occupied by several families. The furniture consists of some mats, an earthen pot, a hearth, &c. The men appear to be employed only in war and the chase. Cook observed, in one part of the country, a peculiar weapon used by the inhabitants: it was a short club, which they swung on both sides; fire and smoke were seen at the same moment, as on the discharge of a musket; but there was no report, and the appearance was of short duration. The Chinese, who trade with the inhabitants, appear to have introduced some of the rites of the religion of Fo among them. Voyagers have observed three varieties of inhabitants, the Papuas (negroes), Haraforas, who are said to live on trees in the interior, and the Badshoos or Oran Badshoos, a wandering tribe of fishermen.

NEW HAMPSHIRE, one of the United States of America, is situated between 42° 41′ and 45° 11′ north latitude, and between 70° 40′ and 72° 23′ west longitude from Greenwich. Its extreme length, from north to south, is 168 miles; its greatest breadth is ninety miles. North of latitude 42°, the state decreases in width, and at the northern extremity it is only nineteen miles wide. New Hampshire is bounded on the north by the highlands between Lower Canada and the United States; on the west by the western bank of Connecticut river, from its northerly source to the south point of Hinsdale, below the entrance of Ashuelot river; south by Massachusetts; east by the Atlantic, a distance of eighteen miles, and by the state of Maine. Its area is 9491 miles, or 6,074,240 acres, including about 110,000 acres of water. This state is divided into eight counties. Near the seacoast, the land is low and level, and the shore is mostly a sandy beach, bordered by salt-marshes. At the distance of thirty or forty miles back from the sea, the country rises into hills, and often into mountains. Between the Merrimack and the Connecticut many considerable mountains are found, as the Monadnock, in Dublin; Sunapee, in Fishersfield; Kearsarge, in Warner; Carr's mountain, in Warren; and the Moosehillock, in Coventry. But the most elevated mountains in this state, and the highest on this side the Mississippi, are the White mountains. The soil of New Hampshire is generally fertile, though it is probably inferior to that of some of the other northern states. The best lands are those on the borders of the rivers, which are annually overflowed. The hills are generally of stony and moist land, and afford excellent pasturage. There are no extensive barrens, and most of the land is capable of cultivation. The high ridge of mountains which divides the waters of the Connecticut from those of the Merrimack, is composed of the older primitive rocks. Granite predominates at the northern and more elevated part of the ridge; mica slate is more abundant in the southern part, and forms the Grand Monadnock and several other high elevations. A beautiful, fine-grained granite occurs in many parts of the state: this affords an admirable building stone, and great quantities are transported to Boston. Eastward of the great ridge, mica slate, gneiss, and green stone are found. Steatite, or soapstone, of good quality, is found at Orford and Francestown; and primitive limestone abounds in several places. Iron ore, of excellent quality, is found at Franconia, and copper ore has been discovered at the same place. Plumbago, or black lead, is found at Bristol and some other places, in large quantities, and of good quality. These are the only minerals that have been found in such quantities as to be much regarded. The largest collection of waters in New Hampshire is lake Winnipiseogee. Besides this are Squam, Ossipee, Newfound, Sunapee, and Spafford's lakes, and lake Connecticut, in the most northern part of the state. A part of lake Umbagog is in this state, and a part in Maine. Five of the largest rivers in New England have their principal sources in New Hampshire, viz., the Connecticut, Merrimack, Androscoggin, Saco, and Pascataqua. The state is remarkably well watered, and the water is generally of the purest quality. The population of New Hampshire in 1810 was 214,460; in 1820, 244,161; in 1830, 269,533. By far the greater part of the inhabitants are engaged in agriculture. The principal articles of produce are beef, pork, mutton, butter, cheese, wheat, rye, Indian corn, oats, barley, pulse, and flax. The state is admirably adapted for grazing. Apples are very extensively cultivated, but other kinds of fruit are not abundant. Dover, Exeter, Peterborough, Franconia, Pembroke, and Keene, have considerable manufacturing establishments. There are no large towns in New Hampshire. Portsmouth is the most populous, and Concord is the seat of government. There are numerous thriving and beautiful villages. The common schools are well supported, and flourishing academies are established in many towns. Dartmouth college is at Hanover. The principal religious denominations are Congregationalists, Baptists, and Methodists. The climate is subject to the extremes of heat and cold, and to great and sudden changes. The air is generally pure and salubrious, and the state is remarkable for the longevity of its inhabitants. Morning and evening fires are frequently needed as early as the first of September, and as late as the last of May. Cattle are housed about the first of November; and, in the course of this month, the earth and rivers usually become frozen, and covered with snow. The open fields are commonly cleared of snow in April.

New Hampshire was discovered by captain John Smith, an English navigator, in 1614. Its name was given by captain John Mason, the original patentee. In the earliest grant made to Mason and Gorges, in 1622, it is styled *Laconia;* and, in some of the earliest histories, it is called *Captain Mason's Patent,* and *Pascataqua.* The first settlements were made at Dover and Portsmouth, in 1623. In 1629, Rev. John Wheelwright purchased of the Indians the country between the Merrimack and the Pascataqua from the ocean back about fifty miles. From the year 1641 to 1679, all the settlements in this state were united with the colony of Massachusetts, and belonged to the county of Norfolk. In 1679, New Hampshire was made a separate province by Charles II. From 1689 to 1692, it was again united to Massachusetts; and also from 1702 to 1741. From 1699 to 1702, it was united with Massachusetts and New York. Benning Wentworth was appointed governor in 1741. A temporary government was established during the war of the revolution. A new constitution was established in 1784; and this, as altered in 1792, is the present constitution of the state.

NEW HEBRIDES; a cluster of islands in the South Pacific ocean, first discovered by Quiros, in the year 1506, who supposed them to be a southern continent, and called them *Tierra Australia del Espiritu Santo.* Bougainville, who explored them in 1768, called them the *Archipelago of the Great Cyclades.* Cook visited them in 1773, and gave them the name of *New Hebrides.* They are in general mountainous, and abound in wood and water. Their principal productions are bread-fruit, cocoa-nuts, and plantains, yams and sugar-canes. The inhabitants appear civil and hospitable, and are of different races. Lon. 166° 40′ to 170° 21′ E.; lat. 14° 30′ to 20° 5′ S.

NEW JERSEY is one of the thirteen original states of the American union; bounded on the north by New York, on the east by New York and the Atlantic ocean, on the south by the ocean, and on the west by the states of Delaware and Pennsylvania. The Hudson river divides it from New York on the east, and on the west are the Delaware river and bay. The length is 163 miles, and the breadth 52 miles; between lat. 38° 17′ and 41° 21′ N., and lon. 75° 30′ and 73° 53′ W. The area in square miles is 7490. The census of

1830 shows a population of 320,779, and an increase of 43,204 since 1820. The territory is divided into fourteen counties—Bergen, Morris, Sussex, Warren, Essex, Somerset, Henderson, Middlesex, Burlington, Monmouth, Gloucester, Salem, Cumberland, and Cape May, and these are subdivided into townships. The face of the country presents every variety; from the north to the south is found a succession of mountains, hills, heights, and plains, each occupying a distinct and well defined region. The southern section of the state, from the Rocky hill ridge, in the county of Middlesex, is an alluvial formation, of which the soil and face of the country, trunks of trees, oyster-shells, and various marine productions, found at great depths, in wells and other excavations, furnish satisfactory proof, strengthened by the fact that, in this part of the state, the hills face the north, are precipitous, and lie on the southerly side of the valleys, from which, on the northerly side, the land rises in a gentle slope, evidently caused by the breaking and subsiding of the waves, bearing in their force the sands of the ocean. The principal internal waters are Second river, Hackensack, Passaic, Raritan, Musconetcong, Rancocus, Salem, Shrewsbury, Tom's river, Great Egg-harbour, Cohansey, and Maurice river. Raritan bay is a spacious estuary on the eastern coast, affording a ready access, at all seasons, from the ocean to Perth Amboy, the chief seaport of the state, and possessing, for this purpose, peculiar and admirable advantages, which have not yet been adequately improved, from the proximity of the commercial emporium of the nation. The Swedes early made settlements in the county of Salem, where some of their descendants still remain, and the names of places given by them are, in some instances, retained. Dutch emigrants spread at an early period from New York, over the county of Bergen. The province was granted by king Charles II. to his brother James, duke of York, by charter, dated in 1664; and being by the latter speedily granted to subordinate proprietors, the settlements of the British rapidly extended. It was, in 1676, set off into two great divisions—East Jersey and West Jersey; each belonging to different proprietors, who held both the right of soil and the powers of government, the latter of which were exercised by governors appointed by the proprietors, and representatives chosen by the people. The proprietary government continued until the year 1702, when the powers of government were surrendered to queen Anne; and the colony remained a royal government until the declaration of independence, the governors being appointed by the crown, and the legislature chosen, as before, by the people, but afterwards representing the whole community, and sitting alternately at Burlington and Perth Amboy, then the principal towns of the respective divisions. In the grants and concessions of the proprietors, under which the colony was settled, the soundest and most liberal principles of civil and religious liberty are declared. These were sedulously cherished by the early colonists, and were, in many controversies with their governors, both proprietary and royal, maintained by the representatives of the people with great firmness, zeal, and intelligence. A sincere attachment to the interests of the mother country was, nevertheless, felt and displayed on all occasions, and was practically manifested in the moneys expended and the blood shed in the expeditions to Canada, and on the borders of lake Champlain, and was maintained until arbitrary exactions and unconstitutional oppression compelled the people, in common with the other colonies, to look to a separation. In the preparatory measures and conventions the delegates of New Jersey were always found. She was among the earliest to resolve on independence, unquestionably the second to comply with the recommendation of the continental congress, and form for herself a constitution of government. One of the earliest members of the first confederation, she adopted promptly, and with peculiar unanimity, the present constitution of the United States. During the war of the revolution, her patriotism was eminent. Some of the most interesting scenes and of the most arduous conflicts of that period, took place within her bounds. Her privations and sufferings were great, from having been long occupied by the rival armies and the seat of hostilities; and at the close she was found to have advanced largely beyond her proportion of the pecuniary expenditures of the contest.

The legislature is composed of two bodies, the legislative council and the general assembly; the former having fourteen members, one from each county; the latter, fifty members, the counties being represented by different numbers, from one to five. The governor is annually appointed, and, like most of the executive, judicial, and military officers, by the two houses in joint meeting. The judicial powers are distributed among a court of chancery, modelled according to the English system, the governor being chancellor, a supreme court of common law jurisdiction over the whole state, with a circuit court for the trial of issues of fact in civil cases in each county, courts of common pleas in the several counties for the trial of civil causes, orphans' courts for matters of testament, administration, and guardianship, and courts for the trial of small causes before justices of the peace. The courts of criminal jurisdiction are courts of general quarter sessions of the peace, courts of oyer and terminer, and general jail-delivery, the supreme court, and the governor and council for the trial of impeachments exhibited by the house of assembly. The military force of the state, according to the official report of the adjutant-general for the year 1830, is 35,360, consisting of cavalry, 1810, artillery, 1886, riflemen, 1115, infantry, 30,456, and general and brigade staff, 93. The literary institutions are two colleges, numerous excellent academies, and many valuable prviate schools. The college of New Jersey at Princeton has long and justly maintained a high reputation, and numbers among its alumni many of the most eminent men of the Union, especially in the Southern States. The other institution, a few years since reorganized under the name of *Rutgers' college*, has already earned distinction. A theological seminary of the Presbyterian church is established at Princeton, and another, under the charge of the Dutch Reformed church, at New Brunswick. A great attention to the cause of public education has recently arisen throughout the state, and measures are in progress which promise important and happy results. A liberal spirit of public improvement has been awakened, and is now encouraging and carrying on a number of works of great public utility.

The people of this state are chiefly engaged in agriculture and manufactures, and but few, comparatively, are employed in commerce. While some parts of the state are sandy and barren, or, being rocky and mountainous, are not well adapted to cultivation, large portions have a soil of great fertility, well suited to the cultivation of grain, and for grazing; and, accordingly, upon the extensive meadows, herds of cattle are raised for the markets of New York and Philadelphia. Large quantities of butter and cheese of superior quality are made. The breed of horses is excellent. Apples, peaches, and fruits of all kinds, are raised in abundance. The Newark cider and the Burlington hams are of great celebrity.

Wheat, rye, Indian corn, buckwheat, potatoes, oats, and barley, are staple commodities. Emigrants from the vine countries of Europe have pointed out some districts as very suitable to the cultivation of the grapes used for the making of wine; and it is believed that the situation of the state furnishes peculiar advantages for the rearing of silk-worms and the making of silk. Manufactures are flourishing and improving. Glass of various kinds, and in large quantities, is made at thirteen different establishments, in the counties of Warren, Cumberland, and Gloucester. Paper is extensively manufactured in Springfield, at Morristown, near Trenton, and at Mount Holly. Gunpowder is made near Spottswood. Iron is probably the most important article of manufacture. Bog ore is found in Burlington and Monmouth; and the mines of the northern counties are rich, and, perhaps, inexhaustible. Forges and furnaces are in active operation in Morris, Sussex, Monmouth, Gloucester, and Cumberland counties. There are rolling and slitting-mills at Paterson, Bridgeton, and Dover. At the latter place chain-cables are made, and at both the former, cut-nails in abundance. The towns most engaged in manufactures are Newark and Paterson. The former is noted for the manufacture of leather, and the exercise of various occupations in which it is employed; also for the making of carriages, cabinet ware, and fancy chairs. The latter is chiefly engaged in the manufacture of cotton, hemp, and machinery. In 1829, there were in Paterson 487 power and hand looms in operation, and four machine factories, in one of which was made, in the preceding year, 15,048 spindles, with their appurtenances; and connected with it is an iron and brass foundery, producing, annually, 35,000 pounds of brass, and 1,020,000 pounds of iron castings. The number of persons employed in the various establishments, many of whom were children, was 1879. The cotton and flax annually consumed amount to 2,779,600 pounds; and the quantity of duck, and cloth of all descriptions, manufactured, 2,604,450 yards.—This state is rich in mineral productions. Limestone extensively prevails. Iron, as already mentioned, is abundant. Marble and zinc are found. Ores of gold and silver have been discovered in the county of Warren, and the former recently near Somerville. Copper mines in Somerset and Bergen counties were wrought before the revolution, and extensive veins are believed to cross the state in a south-westerly direction from Schuyler mine, near Belleville, to the river Delaware. Marl, peculiarly fitted as a manure for the sandy regions, is found in their vicinage. Peat exists in different districts in exhaustless beds. Clay of superior quality for the arts is dug up in great abundance near South Amboy; and sand, used as an ingredient for the finest glass, is carried from beds recently discovered near Port Elizabeth, in the county of Cumberland, to the principal manufactories of the Union. The chief towns are Trenton, Newark, Paterson, Hackensack, Morristown, Newton, Belvidere, Elizabethtown, New Brunswick, Perth Amboy, Princeton, Somerville, Burlington, Mount Holly, Woodbury, Salem, and Bridgeton. The seat of the state government is at Trenton, in which is a state house, a large and convenient but plain building, for the accommodation of the legislature and the superior courts; and near the town stands the penitentiary or state prison, where about 130 convicts are imprisoned, at hard labour.

NEW JERSEY COLLEGE. See *Princeton*.

NEWMARKET; a town in England, partly in Cambridgeshire, but mostly in Norfolk; thirteen miles north-east of Cambridge, sixty north of London. It is chiefly celebrated for horse-races, being the first meeting in the kingdom. The town owes its support principally to the races, which are held chiefly in the spring, and the months of July and October. It has two markets weekly, on Tuesday and Thursday.

NEW MEXICO; a territory belonging to the Mexican United States. See *Mexico*.

NEW NETHERLANDS. See *New York*.

NEW ORLEANS; a city of Louisiana, situated in the parish of Orleans, in a bend of the Mississippi river, on its left bank, 105 miles by the river, and ninety in a direct line from the Balize, at its mouth; lat. 29° 57′ N.; lon. 90° 7′ W. It is 1203 miles from Washington, about 1000 below the mouth of the Ohio, about 1200 below the mouth of the Missouri, and nearly intermediate between Boston and Mexico; population in 1810, 17,242; in 1820, 27,176; in 1830, 46,310. New Orleans is the seat of government for the state, and is the grand commercial metropolis of the Mississippi Valley. No city on the globe possesses so great natural advantages for a commercial capital. The Mississippi, and its tributaries above the city, have an extent of more than 20,000 miles of waters, already navigated by steam-boats, and passing through the richest soils and the pleasantest climates. Its communication with the ocean is easy. Numerous bayous connect it with every part of the state. By a basin and canal, and the boyou St John, it communicates with lake Ponchartrain, and the lakes thence to the gulf of Mexico, the opposite Florida shore, with Mobile, Pensacola, and the whole gulf shore, east and west. A rail-road between the city and lake Ponchartrain, four and a half miles long, perfectly straight, with only sixteen inches ascent and descent, is now opened; and an artificial harbour and break-water in the lake, at the end of the rail-road, will soon be completed. The Mississippi and its principal branches are admirably adapted for steam-boat navigation, and also for the descent of those cheap and capacious vessels, the flat-bottomed boats. The use of steam-boats in towing ships now renders it unnecessary to wait, either at the city or below it, for favourable winds. The forts erected for the defence of the city, during the last war, have been improved, and others have been erected; and the constantly increasing strength of the city itself, and its facilities for receiving the growing strength of the whole Mississippi Valley, must render it secure from foreign invasion. This is but a very brief and imperfect view of the local advantages of New Orleans. The old city, properly so called, is built in the form of a parallelogram, of which the longer sides are 1320 yards, and the shorter, or the depth of the city towards the swamp, 700 yards. Above the city are now built the suburbs of St Mary and Annunciation. Below the city are the suburbs Marigny, Daumois, Declouet. These are called *fauxbourgs*. Between the city and the bayou St John are the villages St Claude and St Johnsburg. The old city is divided into squares, having a front of 319 feet in length; and each square is divided into twelve lots. Few of the streets are more than forty feet wide. The wooden buildings, of which the city was formerly composed, have mostly given place to those of brick. In the old city, the French and Spanish styles of building predominate. The houses are stuccoed externally, and this stucco, of a white or yellow colour, though less durable, is more pleasing to the eye than brick. The fauxbourg St Mary, and other new parts of the city, are built principally of brick, after the American style. Several warehouses, with stone fronts, have lately been erected. In general, it may be said that the city is gradually becoming more purely American in all its characteristics; but a great portion of its inhabitants are of French and Spanish descent, and the French language is used more than the English. During the season of most active business, the manners, dress, customs, and languages of the world at large seem to be here exhibited. Those who desire to witness a display of the commodities of all climates, and all countries, with the costumes and languages of civilized and uncivilized men and women, may do well to visit the market of New Orleans, especially on a Sunday morning in February or March. We have not room, without too much extending this article, to describe the public buildings of this city. In general, they are commodious, elegant, and very expensive. There are few churches, and Sunday is spent more after the custom of Catholic countries than in any of the Atlantic cities. The Catholic cathedral is a noble edifice, ninety feet by 120, with four towers. The roof is covered with hollow tiles, as are most of the French and Spanish houses. The charitable institutions of the city are highly creditable; they are very efficient in alleviating the wants, miseries, and vices of the native and the stranger. The means of education in New Orleans are very limited, compared with those of the other large cities in the United States; but there have been great improvements within the last three years. The police of the city has become very efficient, and scenes of riot and disorder are rarely known. Considering that one half of the people are slaves, and that so great a variety of strangers habitually throng this city, there is more order and good morals than could be expected. The following table will present a view of the commerce of New Orleans.

Imports into New Orleans from the Interior during Six Years.

ARTICLES.	1824.	1825.	1826.	1827.	1828.	1829.
Bacon, assorted, hhds.	349	1,210	470	1,363	3,097	2,668
Bagging, pieces . .	4,362	6,191	5,299	2,795	5,372	13,472
Butter, kegs. . .	1,963	2,190	2,926	4,361	3,860	3,993
Beef, barrels, . . .	732	1,242	1,203	1,792	5,622	5,405
Beeswax, do. . .	295	303	360	603	770	793
Buffalo robes, lbs. .	12,609	17,411	7,740	13,412	19,987	15,210
Cotton, bales, . .	142,575	206,993	251,983	337,934	258,042	260,571
[illegible], do. . . .	1,301	3,747	3,030	11,171	4,365	5,557
Corn meal, barrels, .	4,727	3,420	729	1,027	498	6,849
Corn in ears, do. . .	57,351	72,563	143,373	79,973	89,876	91,882
Flour, do. .	100,980	140,546	129,094	131,096	152,564	157,223
Lard, kegs, ...	18,210	34,373	51,053	85,866	115,935	110,206
Pig lead, pigs, . .	46,454	58,479	86,242	106,405	153,712	146,203
Linseed oil, barrels, .	191	682	706	1,723	2,637	2,940
Deer skins, packs, .	3,668	4,920	11,063	4,169	3,160	6,215
Bear skins, do. . .	165	396	161	253	155	159
Tobacco, hhds. . .	2,373	18,400	19,365	21,704	30,224	29,432
[illegible], do	647	1,332	1,662	6,442	648	4,239

The amount of cotton exported in the year ending September 30, 1830, was 354,024 bales. Many hundreds of flat boats are seen, at the levee, in the busy season, laden with all the productions of the Valley. Steam-boats are coming and departing every hour, and fifty or sixty are often seen in the harbour at one time. A forest of masts is continually seen along the levee, except during the sultry months. Nothing seems adverse to the growth of New Orleans, except the unhealthiness of its climate. The surface of the city is several feet below the level of the river at high water, and the adjacent country is all low and marshy. This is, doubtless, the principal cause of the frequent occurrence of the yellow fever. The legislature have taken active measures to have the country well explored, and are commencing a great variety of works for draining, raising, and otherwise improving it. The streets of the city are now paved, and places of stagnant water are drained, or filled. Water from the river is now made to wash the gutters of the streets. These and other means are expected to improve the healthiness of the place. If it should be made healthy, it will probably become the largest city of America. For further statistical information, see *Louisiana*.

NEW PLATONISTS; a philosophical sect. The sect of Platonists (see *Plato*) was, of all the sects belonging to the Socratic school, the most numerous; but their zeal relaxed, whilst others, particularly the sceptics, began to excite greater interest. In the third century of the vulgar era, however, the Platonists rose anew, and formed a distinct sect—that of New Platonists, also called the *Alexandrian Platonists*, because their chief seat was at first in Alexandria. Their doctrines had a tendency to unite Platonism with Orientalism. The new impulse which the Platonic philosophy, in a new form, suddenly received, is to be explained by the peculiar genius of the first New Platonists; their opposition to scepticism; the inclination of the Greeks, enervated by luxury, to mysticism and Oriental fanaticism; and a desire to oppose to the victorious progress of Christianity a philosophical system of paganism. The New Platonists aimed at the highest knowledge,—the knowledge of the *absolute*, and an intimate union with it, in order to fulfil the destiny of man, to attain a perfect acquaintance with the universe, holiness, and happiness, to which, as they maintained, the knowledge of the *absolute* (θεωρια) would alone lead. Ammonius Saccas of Alexandria (a man of extraordinary genius, who was obliged to earn his bread by carrying loads, and who, according to the common opinion, was the founder of this school) inspired his pupils, among whom were the famous critic Longinus (q. v.), Plotinus, Origen, and Herennius, with his own poetico-philosophical zeal. Plotinus (born at Lycopolis, in Egypt, A. D. 205, and died 270) contributed chiefly to settle the doctrines of New Platonism, in his writings. Philosophy, according to him, should know the One which is the cause and essence of all things, the original light from which every thing emanates, not by thought and reflection, but, in a perfect manner, by intuition, which precedes thought. The philosophy of Plotinus, therefore, rests on the the propositions that the absolute, that which is above the senses, is the foundation of the world; and that it is knowable by intuition, which precedes thought. Intelligence, the product and image of the One, penetrates all things; and the soul proceeds from it, as the forming thought; the soul again seeks the One, the Good, the original cause of the universe. This is done by immediate intuition and enjoyment; and thus, according to him, the conceiving and the conceiver become one; the conceiving soul becomes what it conceives; it returns to the One. The whole spiritual world is therefore to be considered as one spiritual being. All is only an intuition. The sensible world is but the image of the intelligible world; time is an image of eternity, and emanates from it. Evil is either only apparent, or necessary; but if necessary, it ceases to be evil. Among the pupils of Plotinus, Porphyry (Malchus), and Amelius are distinguished. Jamblichus, a pupil of Porphyry, had a large number of disciples, among whom Eustathius, Ædesius, and the emperor Julian, were the most celebrated. At a later period, Athens became the seat of New Platonism. Among the later New Platonists, Proclus of Constantinople (from 412 to 485) is distinguished. Two circumstances chiefly render the New Platonists interesting: first, that poetical elevation of the soul which is most welcome when the student has passed through all the dogmatic systems and scepticism, without finding satisfaction; and, secondly, the reconciliation which their system attempts between the Greek philosophy, on one side, and the most ancient symbolical system of the East, paganism in general, on the other. Hence, also, the union of Platonism and the Pythagorean philosophy, and the desire of uniting the contending views of former sects. This attempt, however, to conceive the popular religion, or paganism in its original sense, has led some to reject those accounts which they cite to prove their opinions; and it has been asserted that they, themselves living at so late a period, cannot be testimonies to facts partly buried in the obscurity of remote history. But, on the other hand, it has been asserted that many of these antiquarian and mythological notices, which we find first or only with the New Platonists, bear too much the stamp of truth to be considered as invented by them, and that they might have been taken from earlier sources. The scholastic philosophy and dialectic subtlety of the middle ages, which were addressed solely to the understanding, and the want of a philosophy which should satisfy the whole nature of man, caused, towards the end of the fifteenth century, the renewal of Platonism, as modified by the New Platonists. The most distinguished supporter of this new Italian Platonic philosophy, patronised by the Medici, in Florence, was Marsilius Ficinus, who died in 1499.

NEW PROVIDENCE. See *Providence.*

NEW SOUTH WALES; an English colony, on the eastern coast of New Holland. (See *Holland, New.*) Cook landed here (1770) on his first voyage, took possession of the country in the name of his sovereign, and called it *New South Wales.* He also gave its name to Botany bay, which he entered at the same time. The favourable report which he made of the harbour and the neighbouring country, determined the British government to found a colony there (1778), which was soon after removed to Sydney, in Port Jackson, and which, although composed, in a great measure, of convicts, soon became very prosperous. In 1803, a settlement was established on Van Diemen's Land. (See *Diemen's* (*Van*) *Land.*) In 1813, the Blue mountains were passed, and, in 1815, the site of the town of Bathurst (140 miles west of Sydney) was selected. In 1829, exploring parties had penetrated to a distance of 600 miles into the interior. On the eastern coast, colonisation has extended to Moreton bay, 450 miles north of Sydney, and to Port Western, at an equal distance south. Swan river (q. v.) settlement was established on the western coast of New Holland in 1829. By a proclamation of the governor, in 1829, the limits within which it was permitted to settle, comprised 34,000 square miles, and included nineteen counties. The census of that year gave a population of 36,548 souls. The number of acres located was 2,906,000; cleared, 231,573; cultivated, 71,523: horses, 12,479; horned cattle, 262,868; sheep, 536,391. The staple of the colony is wool, of which, in 1822, 172,880 pounds were exported: in 1829, the export had increased to 1,006,000 pounds. The total value of exports in 1829 was £184,720; of imports, £678,063. The inhabitants consist of the officers of the colony, who are landed proprietors, and have some of the convicts as servants; of voluntary emigrants, generally poor persons, transported free of expense, to whom land, &c., is given; of convicts who have become free; and of convicts still under the operation of their sentence. Bushrangers are convicts who escape to the woods, and live by depredations on the colonists. The colonists have lately turned their attention less exclusively to pasturage, and more to agriculture; corn, potatoes, tobacco, hemp, flax, and all kinds of tropical fruits, are cultivated. The climate is mild and healthy; the winter is rainy; it begins in March, and continues till August: there is no snow except on the highest mountains. The colony, although it promises to be of great importance to the mother country, has thus far been a burden. The revenue, in 1828, was £102,577; the expenditure, £287,954. The commercial connexions are principally with Britain, Cape of Good Hope, China, Mauritius, Van Diemen's Land, and New Zealand. The moral condition of the colonists is low: schools, however, have been instituted, and are producing good effects; and, in 1829, a college was founded at Sydney. Several newspapers, and three or four quarterly periodicals, are published. The government is under a governor-general, and a legislative council (created in 1829); justice is administered by civil, criminal, and admiralty courts. For further information, see Cunningham's *New South Wales* (London, 1827), and the *Asiatic Journal or Monthly Register for India, China, and Australia.*

NEW SPAIN. See *Mexico.*

NEWSPAPERS. One of the most remarkable phenomena of modern times is the periodical press, vitally affecting society in all its relations, and forming one of the political elements of modern free nations, which the ancients had not even in embryo. They make the course of the statesman very different, and, with most nations, much more difficult, in the present than in former times, so that our days have witnessed not merely the shipwreck of a ministry on these dangerous breakers, but that of a whole dynasty. Of the periodicals, the newspapers form the most powerful political engine; and of them we shall treat chiefly in this article, leaving a few more remarks for the head *Periodical.* Reviews, and the like, may contribute more to enlighten the public mind on certain important questions; but the wide diffusion of newspapers, their rapid communication of intelligence on subjects of immediate interest, and the means which they afford of acting on the public mind in its state of highest excitement, make them much more powerful as political engines. Newspapers have changed all the relations of government by their unceasing activity. So important an agent of modern society offers a vast field for remark. We might treat of their effects, and of what is, and what ought to be, their character; also of the great difficulty which future historians will find in distinguishing, in many cases, the true from the false in the great mass of conflicting statements which these records of the time present—a difficulty not less than that which arises from the scantiness of materials in respect to many parts of ancient history; but we fear that even a mere historical treatment of the subject will carry us beyond our proper limits.

The origin of newspapers, like that of many institutions important to modern civilization, is to be referred to Italy. The war which the republic of Venice waged against Solyman II., in Dalmatia, gave rise, in 1563, to the custom in Venice of communicating the military and commercial information received, by written sheets (*notizie scritte*), to be read at a particular place by those desirous to learn the news, who paid for this privilege in a coin, not any longer in use, called *gazetta*—a name which, by degrees, was transferred to the newspaper itself in Italy and France, and passed over into England.* A file of these Venetian papers, for sixty years, is still preserved in the Magliabecchi library at Florence. The first regular paper was a monthly, written, government paper at Venice; and Chalmers, in his life of Ruddiman, informs us that "a jealous government did not allow a *printed* newspaper; and the Venetian *Gazetta* continued long after the invention of printing, to the close of the sixteenth century, and even to our own days, to be distributed in *manu-*

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* Some etymologists have thought the name *gazetta* is to be derived from *gazzera*, a magpie, or, in this case, a chatterer; others from the Latin *gaza*, which, being colloquially lengthened into *gazetta*, would signify a little treasury of news. The Spanish derive it, indeed, from the Latin *gaza* (Greek, γάζα), though their newspapers, least of all, deserve the name of treasure. They have a peculiar word, wanting in our idiom, *gazetista*, a lover of the gazette. The German *Zeitung* is from the ancient *theidinge*, or *theidung* (the English *tiding*, the Swedish *Tidingar*).

script." Those who first wrote newspapers were called, by the Italians, *menanti*, because, says Vossius, they intended, commonly, by these loose papers, to spread about defamatory reflections, and were therefore prohibited in Italy, by Gregory XIII., in a particular bull, under the name of *Menantes* (from the Latin *minantes*, threatening). Menage derives the name, with more probability, from the Italian *menare*, which signifies "to lead at large," or "spread afar." Perhaps it will not be irrelevant, however, for the writer to remark that it is common for the Mecklenburg peasantry, as he knows from experience, to call the newspaper *de Logenblad* (the lying paper); and the German proverb, in use to this day, "He lies like print (*er lugt wie gedruckt*)," is probably connected with this view of early newspapers. The first English genuine newspaper appeared under Elizabeth, in the epoch of the Spanish armada, of which several, printed when the Spanish fleet was in the English channel, during the year 1588, are preserved in the British museum; and it is very curious how much the mode of communicating certain kinds of intelligence in these early papers resembles the forms in use at present. The earliest newspaper is entitled The English Mercurie, which, by *authority*, was "imprinted at London, by her highnesses printer, 1588." These were, however, but extraordinary gazettes, not regularly published. Periodical papers seem first to have been more generally used by the English during the civil wars of the time of the commonwealth, to disseminate sentiments of loyalty or resistance. They were called *weekly newsbooks*. Though *Mercury* was the prevailing title of most, the quaintness which marks the titles of books in that age is found also in the names of the "newsbooks;" for instance, the *Secret Owl*, *Heraclitus Ridens*, the *Weekly Discoverer*, and the *Discoverer stript Naked*, &c. A catalogue of the Mercuries would exhibit a curious picture of those singular times. For more particulars respecting the further development of newspapers in the troubled and changeable times which followed the period of the commonwealth, we refer the reader to D'Israeli's interesting *Curiosities of Literature*, division *Origin of Newspapers*, in vol. i.; also to Johnson's *Lives of the English Poets* (Addison). For laws enacted respecting newspapers, under Pitt, and subsequently, as well as for a general view of the moral and political influence of the English periodical press, we refer the reader to the *Periodical Press of Great Britain and Ireland* (London, 1824); also to *Babylon the Great* (London, 1825, 2d vol.); and to the abstracts of acts of parliament, given, among other works, in the Annual Companion to the British Almanac.

In Germany, newspapers originated with the *relations*, as they were termed, which sprung up at Augsburg and Vienna in 1524, at Ratisbon in 1528, at Dillingen in 1569, at Nuremberg in 1571, where they originally appeared in the form of a letter, and printed, but without the place of printing, and without number. The first German newspaper, in numbered sheets, was printed in 1612, and was called "Account of what has happened in Germany and Italy, Spain and France, the East and West Indies, &c." Since that time, public papers have successively appeared in various places, under the titles *Relation*, *Ristretto*, *Correspondent*, *Courier*, *Chronick*, *Realzeitung*, &c., which were placed by the governments under censorship.

Thus it appears that the desire to receive news from the theatres of war, and from foreign countries, gave birth to regular newspapers in England and Germany; but the case was different in France. De Saint Foix, in his curious *Essai historique sur Paris*, says that **Renaudot**, a physician at Paris, to amuse his patients, was a great collector of news, and thus much increased his practice. As the seasons were not always sickly, he considered that he might turn his treasures to better account, by giving every week to his patients some fugitive sheets, which should contain the news of various countries. He obtained a privilege for this in 1632. The French, at the beginning of the revolution, imitated the English newspapers; but, as their passions became more and more heated, there arose papers like Marat's *Ami du Peuple*, and Hebert's *Père Duchesne*, which, at present, we can hardly conceive of as having really existed. A history of the French press during the revolution would be exceedingly interesting. Napoleon made great use of the *Moniteur* as an official organ for furthering and making known his projects. (See the article *Moniteur*.) After the restoration, it declined in interest and popularity, since the royal government, to operate on the public opinion, often made use, in preference, of the semi-official papers, which were frequently under the influence of one minister or another; but, long before that event, owing both to its high price (100 francs a year), and to its necessary partiality, it was by no means the most read of the Paris journals. The *Journal de Paris* appeared first in 1777, and remained in existence during and after the revolution, but was several times obliged to change its political character. During the ministry of Decazes (1818—20), it was under the influence of this minister. It terminated, in June, 1827, its vacillating and equivocal career. The *Gazette de France* was the first regular French gazette that appeared. It was established by Renaudot in 1631. Up to 1792, it forms a series of 163 volumes. With a few interruptions, it also continued during the revolution; and, after the second restoration, it belonged, with the *Quotidienne*, the *Drapeau blanc*, &c., to the papers of the ultra party. The French gazettes are undertaken in shares; and, as these shares can be sold, it is easy to understand how the gazettes can be bought by the ministry. Each minister made use, without hesitation, of his own journal: thus M. de Damas, minister of foreign affairs, took the *Drapeau*, and M. de Corbière, minister of the interior, the *Gazette*. This paper was discontinued in June, 1827; but, in July, 1827, the *Etoile*, an evening paper, assumed the name of *Gazette de France*, and became the organ of Villèle, whom it continued to defend after his fall, and assailed the succeeding ministry with the most bitter vehemence. It became the most violent defender of absolute monarchy, and, under Polignac, constantly demanded a *coup-d'état*. At present, it defends the cause of legitimacy and Charles X. The *Etoile* formerly belonged to M. de Peyronnet, the minister of justice, and to the Congregation. It received 20,000 francs from the treasury, for publishing the articles of M: de Villèle. It was, moreover, the advocate of Jesuitism. The *Quotidienne* has belonged to M. Michaud, the historian of the crusades, to M. de Vitrolles, &c. It was a violent supporter of absolutism and the clergy. It is said that the royal papers cost the government, before the last revolution, 5,000,000 of francs. In the early times of the revolution, the most distinguished anti-revolutionary papers were the *Actes des Apôtres* (conducted by Peltier), and the *Ami du Roi;* and the most distinguished advocates of the revolution were the *Chronique de Paris* (by Condorcet, Noel, &c.), *L'Orateur du Peuple* (by Fréron), the *Journal de la Cour et de la Ville* (begun by M. Brun, afterwards marshal), and many others. The rapid succession of revolutions had a great influence on the appearance and disappearance of the Paris gazettes. For a long time, the *Journal du Soir* maintained itself undisturbed, and uninterrupted by any revolution. By its tone, simple, intellectual, and free from the shackles of party, it rode through all the perils of revolutions; and it became a kind of proverb, that, not to be guillotined, shot, or transported, it was necessary to know how to tell the truth like the *Journal du Soir*. The directory made use particularly of the *Redacteur* to make known its policy to France and the world. One of the most important Paris gazettes, which began in 1791, and has been continued till the present day, is the *Journal des Débats* (1804—14, and, in March, 1815, called the *Journal de l'Empire*). For a time, Chateaubriand used to write for it against Polignac. At present, it is the paper of the *juste milieu*, and M. Kératry, who fought, in July, 1830, on the side of the people, is one of its editors. With it the editor united, in 1800, a *Feuilleton*, comprising the *débats littéraires* (literary discussions). This part of the journal was superintended by distinguished men, such as Fiévée, till 1807, who was followed by Etienne. In the abbé Geoffroy, especially, it had, for thirteen years, a contributor, by whom it was rendered so popular, that 30,000 copies are said to have been sold. Since this time, the Paris gazettes have not contented themselves with mere political news, but have all given literary and theatrical notices. For both Geoffroy manifested an extraordinary talent, and, in this *Feuilleton*, he daily presented interesting essays, equally distinguished for knowledge and wit, and for sharp satire and humour. Since Geoffroy's death, the sale has diminished. The best contributors were, subsequently, Malte Brun, Hoffman, and Duricquet, in the dramatic department. For a time, it was a ministerial paper, in which Villèle and Chateaubriand communicated their views. When Chateaubriand left the ministry, he made the *Journal des Débats* an opposition paper.

Under Napoleon, the press in France, as in all Europe, with the exception of England, was in a low state, and, in all that concerned politics, only the echo of what the *Moniteur* promulgated, a paper in which the French emperor not unfrequently caused paragraphs to be inserted, written by his own hand. After his return from Elba, he restored the freedom of the press; but it was cautiously used. After the restoration, the gazettes were subjected to the censorship, which did not cease till 1819. Various enactments were, however, made, which rendered the establishment of a daily journal very difficult: several new gazettes, nevertheless, appeared. But, notwithstanding these competitors, the most popular Paris journal continued to be *Le Constitutionnel* (q. v.), which was founded in 1815, by fifteen shareholders. In its sentiments, it was constitutional, but in its language, moderate. It was conducted by Etienne, Jay, and Tissot. Twenty thousand copies were said to have been sometimes sold. At first, a share was worth 3000 francs: afterwards, 100,000. The *Courrier Français*, formerly conducted by Kératry, was much more liberal, but had a less sale, and the editor was frequently summoned before the criminal court. The *Journal du Commerce* belongs almost solely to Paris merchants. It frequently treats financial questions with great knowledge of the matter. From it we generally gather Laffitte's opinions.

In the history of the French press, the *tendency suits*, as they are styled, are deserving of mention. On the entire emancipation of the press, in 1819, the spirit of political party was so fomented, and gave rise to such excitements, that the government, together with two other laws of exception, which they laid before the chambers, after the murder of the duke of Berry, proposed anew to subject the journals to the censorship—a proposal which met with violent opposition from all parties, but was, nevertheless, passed in the chamber of deputies, March 30, 1820. This law of exception was prolonged in the session of 1820, so as to embrace the period of the session of 1821, but was afterwards repealed, and supplied by the supervision of the police, because the censorship was found incompatible with a representative constitution. On the other hand, the new laws against the abuses of the press were drawn up in stricter terms. Both the proprietors and editors were made responsible, and libels were punished by fine and imprisonment: even the intention, the secret purpose of a suspicious article, could be made punishable, if its tendency appeared dangerous. The proprietors were compelled to give securities for the good behaviour of gazettes and periodical papers, in sums of 750—10,000 francs rents. For Paris, a security of 10,000 francs rents was necessary, calculating, therefore, according to the then rate of interest, a capital of 150,000 francs. Villèle finally succeeded in restoring the censorship; but, when he convened the chamber of representatives in 1827, the censorship was obliged to cease. After Villèle's downfall, a milder law of the press was submitted, in 1828, by the new ministry to the chambers, and accepted. (For the attack on the press by Polignac, see *France*.) A French paper (*Le Compilateur*), in an article written in 1829, and speaking of things as they then stood, says, "There are in Paris 152 journals, literary, scientific, and religious, and seventeen political,—in all 169. Of these papers, 151 are constitutional, or, as they are called, *liberal*, the eighteen others being more monarchical in their spirit. The 151 constitutional journals have, it is stated, 197,000 subscribers, 1,500,000 readers, and produce an income of 1,155,200 francs: the eighteen others have 21,000 subscribers, 192,000 readers, with an income of 437,000 francs. *Le Moniteur*, the official paper, has from 2500 to 4000 subscribers, principally public functionaries; *Le Constitutionnel*, 18,000 to 20,000 subscribers; *Journal des Débats*, 13,000 to 14,000 subscribers; *Quotidienne*, 5000 subscribers; *Courrier Français*, 4500 subscribers; *Journal du Commerce*, 3500 subscribers; *Gazette de France*, 7000 subscribers; *Messager des Chambres*, which, since the accession of the Polignac ministry, seems to have taken up liberal ideas, has 2500 subscribers; *Tribune des Departemens*, a new paper, 100 subscribers; *Nouveau Journal de Paris*, 1000 to 1500 subscribers. These are all published in the capital: those printed in the provinces are calculated at seventy-five journals, exclusive of papers for advertisements, and ministerial bulletins. Of these, sixty-six are constitutional, supported only by their subscribers of the same way of thinking. One (the *Mémorial de Toulouse*) is supported by the archbishop of that diocese; four are, it is asserted, paid from the secret funds of the Jesuits: the other four are described as monarchical, but of little influence." So far the *Compilateur*. In 1812, there appeared forty-five journals in Paris; in 1826, 179; in 1829, their number was 309; hence more than six times as many as in 1812, and two-fifths more than in 1826. Among those branches for which there were, in 1812, no journals, commerce had, in 1829, fifteen journals, the Catholic worship twelve, morals and philosophy six, Protestantism three, gardening three, the marine two, magnetism two, free-masonry one; manufactures (which had, in 1812, but one) and political economy (which had none) had, in 1829, seven. Even gambling and lotteries had acquired three organs. The literary gazettes had increased in that year from five to sixty-one; the political, from five to thirty-two; the advertising papers, from one to twenty-seven; the medical, from five to twenty-eight; periodical publications for education, from two to fourteen; journals for general literature, from three to twelve; the journals which relate to public institutions, and the administration, from one to ten; the law papers, from ten to eighteen, &c. No branch whatever had fewer papers than in 1812: one branch only had retained the same number,—bibliography, which had one. If we compare, however, the two years, in respect to the frequency of publication, the increase appears still greater. While, in 1812, twenty-eight monthly papers, and, in 1827, 107 monthly (therefore not quite four times as many), appeared in Paris, the number of daily papers, in 1829, was six times greater than in 1812 (5:30); moreover, there appeared forty-seven journals twice a week, while, in 1812, no paper of that sort was issued: in 1829, there were forty-five weekly publications, while, in 1812, there were but two. It must also be mentioned, that almost all the papers were printed, in 1829, on larger sheets, and the periodicals in thicker volumes: in short, we believe it would be correct to say that the above proportion of forty-five to 309 expresses but half of the actual increase. In the departments, the periodicals of 1812, 146 in number, had increased, in 1829, to 398. In 1812, there were sixty-four political papers; in 1829, eighty-one: of scientific papers, and those for the fine arts, in 1822, only thirteen; in 1829, fifty-one: for literature, in 1812, one; in 1829, sixty: advertising papers, in 1812, sixty-eight; in 1829, 206. Nine departments which, in 1812, had no papers at all, had, in 1829, several. Almost all have more than in 1812, and very few, as Haute-Vienne, have a smaller number. Only in one province four whole departments had taken no part in this general advancement, and this province is the very one which M. Dupin has marked so black on his map of political economy,—Bretagne. In Paris, then, the increase had been six-fold, in the departments three-fold. One of the chief causes of this difference was that, in Paris, where so many printers reside, some independent ones were always found who would undertake liberal publications, while, in the departments, the influence of the prefect, bishop, &c., was too great. Another cause was the immense centralization in Paris, effected by the revolution and Napoleon. If France ever receives the municipal administration for which she has sighed so long, the departments will immediately appear more independent of Paris. We cannot give a statement of the French papers since the revolution of 1830. New papers have been started, as the *Révolution;* old ones have ceased; several have changed their colour.

As regards the French journals devoted to literature, amusement, and general discussion, we may observe that the *Mercure de France* was, for more than a century, the only weekly journal of this character. The whole series (1672—1813) consists of 1657 volumes in 12mo, and 110 volumes in 8vo. It is still kept up, but has little popularity. In 1818 and 1819, the ultra-liberal *Minerve Française* made a great noise by its political pieces. The chief contributors were Etienne, Jay, Jouy, Tissot, and Benj. Constant. The circulation was computed at 15,000 copies, and the net profit to each of the seven proprietors was 30,000—40,000 francs a year. After the restrictions of the freedom of the press, it was discontinued in March, 1820. The *Tablettes Universelles*, edited weekly, since 1823, by Coste, has contained some very able essays on general politics and literature, and maintained with success the character of a legitimate opposition. But, in 1824, these *Tablettes* took the tone of the ministry, who had succeeded in purchasing of M. Coste the property of the journal for a very high sum (180,000 francs). The most valuable, and, in some measure, the leading paper in philosophy and literature, is the Globe of Paris, in which professor Cousin has taken a part. It has contributed to make the French more liberal in their views of foreign literature. In Italy there are similar periodicals; thus the *Giornale Arcadico di Roma* embraces literature, fine arts, and miscellaneous subjects. In Milan, since 1828, has appeared the Echo (*Eco*) which endeavours to keep up a literary intercourse between Italy and other countries. In the Netherlands, Sweden, Denmark, &c., there are similar journals, which we have not space to enumerate.

Italy, Spain (till the revolution of March 7, 1820), and Portugal, present little worthy of notice, as respects the periodical press. During the occupation of these countries by the French, it was, indeed, more developed than before; but Napoleon left it no freedom. At present, from causes easily understood, it has fallen still lower in these countries. The *Restaurador*, in Madrid, has been devoted, since the restoration, in 1823, to the political system of the clergy, and the *Gaceta*, of Madrid, has a semi-official character. Of the Italian gazettes, the *Gazette di Firenze*, the *Gazetta di Milano*, and the *Diario di Roma*, are the only ones that are read in foreign countries.

In the Netherlands, there were, in 1829, newspapers in the Dutch and French languages. Several of the latter, and, above all, the *Vrai Libéral*, in Brussels, have been among the most fearless journals of Europe, on which account the editors have been constantly at variance with the tribunals. The press in the Netherlands has been, indeed, free, but the law of libel so much the more rigorous, and not unfrequently enforced with great severity, especially since the law of 1815; but, in 1829, the project of a milder law respecting the press was submitted to the chambers. For a long series of years, the (French) *Gazette de Leyde* enjoyed a great reputation, and was regarded as the *gazette diplomatique* of Europe. It was the property of the Luzac family in Leyden, by whom it was edited for several generations, with the greatest care, and in the purest French style. Of the gazettes published in Dutch (called *courants*), the Haarlem gazette is the most popular, and has the most extensive sale. In almost every Dutch town, there is published such a courant, filled, for the most part, with articles of intelligence; and in all of them the singular custom has been introduced of printing them with lines running lengthwise on the margin. In the year 1828, the *Niewsen-advertentie-blad*, the *Gazette des Pays Bas*, the *Industriel*, with some others, were the most important political papers. In 1826, there appeared, in the Dutch language, eighty daily and weekly papers, and thirty-five monthlies.

In Switzerland, there appeared, in 1824, eleven political papers, seven of which were German, two French, and two Italian. A later account of Switzerland states, that twenty-four newspapers appear each week, edited nine by Catholics, fifteen by Protestants, not including five papers appearing once a week or fortnight, nor merely scientific periodicals. (See *La Chronique Suisse* of 1830.) In Sweden, there is not much opposition or independence among the papers. See *Swedish Language and Literature.*

The *Statistique et Itinéraire de la Russie*, by J. H. Schnitzeler (Paris and St Petersburg, 1829); informs us that, in 1829, seventy-three papers and periodicals were published in the empire. The first paper was published in 1703, under Peter I. The *Severnaïa Ptchela* (Bee of the North) seems to have most subscribers. It appears at Petersburg three times a week. Several papers are published in foreign languages; for instance, the *Gazette de St Petersbourg*, and the *Journal de St Petersbourg.* We refer, for more information, to the above mentioned work, page 106 et seq.

The Greeks have had, since 1821, political journals in their language: Maxime Rayband also published in Patras, a weekly paper, the *Courrier d'Orient.*

In Smyrna, the place of the *Spectateur Oriental* was taken, in 1827, by the *Observateur Impartial* (friendly to the Turks), and subsequently by the *Courrier de Smyrne*. Even Tripoli (in Barbary) has had, since July 31, 1827, a political and literary French monthly—*L'Investigateur Africain*. The following is copied from Rufus Anderson's Observations upon the Peloponnesus and Greek Islands, made in 1829 (Boston, 1830). "There are two newspapers now published in liberated Greece, which exert considerable influence, although neither has a numerous subscription. One is in the Greek language, the other in the French. The former, called the *National Journal*, is the organ of government: it is printed twice a week, and costs six Spanish dollars. The latter, entitled the *Oriental Courier*, is issued once a week, and is professedly devoted to politics, commerce, and literature. Three newspapers in the modern Greek language were published in Vienna before the revolution. Among the newspapers which appeared in Greece during the revolutionary struggle, were the following: the Ephemerides of Athens, edited by Mr Psillas; the Friend of the Laws, edited by Mr Chiappa, an Italian, at Hydra; the Greek Chronicle, edited by doctor Meyer, a German, at Missolonghi; and the Greek Telegraph, printed at the same place, under the auspices of lord Byron," &c. We might mention here the French paper *Le Spectateur Oriental*, published at Smyrna.

In Germany, as in France, the periodical press was of little importance till the French Revolution, and, compared with Britain, France, and even the Netherlands, it has always remained so. By the resolutions of the German diet of September 20, 1819, it has again been placed under strict supervision. Till the beginning of the French revolution, the *Hamburger Correspondent* was almost the only gazette in Germany which derived its information respecting foreign countries from original correspondence. The *Neue Zeitung*, in Hamburg, could not eventually sustain a competition with it, and was discontinued. From these and similar sources, articles were copied into hundreds of provincial papers, and this was then called editing a gazette. This explains, in part, the contempt which was connected in Germany with the idea of a newspaper writer, and which, even of late, when this employment has been more worthily pursued, has not entirely disappeared. The sale of the *Hamburger Correspondent* continued to increase from the breaking out of the revolution. At that time, the sale of the *Correspondent* was rated at between 30,000 and 36,000 copies. On the union of Hamburg with the French empire, it received such a blow, that, in a short time, the sale amounted to only a few thousands. In 1828, twenty-one gazettes, daily and weekly sheets, were published at Hamburg. Argumentative papers, in the character of the French and English gazettes, there were, properly speaking, till very lately, none in Germany; but a new kind of periodical sprang up in Germany in 1798, which soon outdid all others—the Universal Gazette. The bookseller Cotta, then in Tubingen, conceived the first idea of it. The *Allgemeine Zeitung* (Universal Gazette) is published at Augsburg. It has correspondents in all the countries of Europe, who supply it with intelligence; the German and foreign governments also frequently make use of it to influence the public by semi-official articles. This has been done with much dexterity by the Austrian government, especially in its transactions in paper money and public stocks; even the French ministry frequently made use, in the period of 1818—20, of the *Allgemeine Zeitung* (though yet more of the London papers). In the appendix there are frequently interesting surveys of the political literature of particular countries. Biographical notices and characters are given of remarkable travellers and the most important public characters of our times. Notwithstanding all these advantages, the sale of the *Allgemeine Zeitung* is, on the whole, small, and merely covers the expenses. In 1817, it amounted to about 2000 copies; at present some estimate it at 5000, others at 1500—2000. Besides this political paper, Cotta has published since 1828, *Das Ausland*, a journal for the knowledge of the intellectual and moral condition of other nations; and, on a similar plan, he has published in Munich, since 1829, *Das Inland*. The latter embraces Germany alone, with particular reference to Bavaria. During the subjugation of Germany by the French, the German papers avoided relating any political news, which had not been inserted in the *Moniteur*, or some one of the semi-official papers of Paris. The emancipation of Germany in 1813, gave rise to a number of political papers in the awakened spirit of the times. Kotzebue and Niebuhr each commenced such a journal, but both were soon discontinued. Among the most celebrated gazettes of this period, the *Rheinische Merkur* of Gorres (q. v.) should be particularly mentioned. January 23, 1814, appeared the first, and January 10, 1816, the last number. In Austria, which, excepting the official gazette of Vienna, had, till then, produced no journal of any political or literary importance, a paper called the *Œstreichische Beobachter*. (Austrian Observer) arose, which was soon regarded as semi-official, and was read with attention throughout Germany, as it was the only one which permitted itself (from 1809—13, to throw, from time to time, a few rays of light on the subject of Spain, and the political situation of the European powers. The proprietor and editor of this paper is Mr von Pilat, the private secretary of prince Metternich. The sale of the paper in the period just mentioned is said to have amounted to 6000 copies. According to the *Hesperus* (1824, Nos. 228, 230, 257 et seq.), the periodical literature of Austria, including the Bohemian, Hungarian, and Italian, is to that of Prussia as 27 to 47. By the decrees of the German diet of September 20, 1819, which were to remain in force for five years, and have since been indefinitely prolonged, all the German gazettes, even in states such as Weimar and Würtemberg, where the censorship was formally abolished by the constitution of the country, were placed anew either under censorship or ministerial supervision. For the literary journals of Germany, we must refer to the article *Periodicals*. The German papers of amusement had their origin with the *Zeitung für die Elegante Welt* (the Gazette for the Polite World), established in Leipsic in 1801. The number of journals of this character has since been constantly increasing, although many have perished with the same rapidity with which they arose. One of the most distinguished is the Stuttgart *Morgenblatt* (21st vol. 1830): we might also mention the Dresden *Abendzeitung*, the Berlin *Gesellschafter*, and the *Literarische Wochenblatt*, established by Kotzebue. Other places have similar papers devoted to the entertainment of cultivated readers. The circulation of these papers, with a few exceptions, does not extend beyond the limits of the country in which they appear. The *Morgenblatt*, many of which go particularly to Austria, has the greatest sale: it is estimated at 1500. The journals in the gazette form, have almost superseded, in Germany, the monthly magazines. There are, among the local and provincial papers, several which, under a liberal censorship, might do much good.

The republic of Colombia had, a short time since, sixteen political papers; the other American states, Paraguay excepted, have likewise periodical journals. In Chile, which received its first printing press from the United States, in 1810, there are now seven gazettes. The British colonies have likewise their journals. At the Cape, the South African Commercial Advertiser, established in 1824, is valuable for its statistics.

No country has so many newspapers as the United States. The following table, arranged for the American Almanac of 1830, is corrected from the Traveller, and contains a statement of the number of newspapers published in the colonies at the commencement of the revolution; and also the number of newspapers and other periodical works, in the United States, in 1810 and 1828.

States.	1775	1810	1828	*States.*	1775	1810	1828
Maine .			29	Georgia .	1	13	18
Massachusetts	7	32	78	Florida . .		1	2
New Hampshire	1	12	17	Alabama .			10
Vermont .		14	21	Mississippi .		4	6
Rhode Island	2	7	14	Louisiana .		10	9
Connecticut	4	11	33	Tennessee .		6	8
New York	4	66	161	Kentucky .		17	23
New Jersey .		8	22	Ohio . .		14	66
Pennsylvania	9	71	185	Indiana. .			17
Delaware .		2	4	Michigan .			2
Maryland .	2	21	37	Illinois . .			4
				Missouri .			5
District of Columbia .		6	9	Arkansas .			1
Virginia .	2	23	34	Cherokee Nation			1
North Carolina	2	10	20				
South Carolina	3	10	16	Total .	37	358	802

The present number, however, amounts to about a thousand. Thus the state of New York is mentioned in the table as having 161 newspapers; but a late publication states that there are 193, exclusive of religious journals. New York has 1,913,508 inhabitants. There are about fifty daily newspapers in the United States, two-thirds of which are considered to give a fair profit. The North American colonies, in the year 1720, had only seven newspapers: in 1810, the United States had 359; in 1826, they had 640; in 1830, 1000, with a population of 13,000,000; so that they have more newspapers than the whole 190 millions of Europe.

We have seen that newspapers were first issued in England by authority, in 1588, during the alarm occasioned by the approach of the Spanish armada, in order, by giving authentic information, to allay the general anxiety, and prevent the circulation of false rumours. From that time, newspapers have, with a few intermissions, generally appeared in London, sometimes at regular, and sometimes at irregular, intervals. During the civil wars, both parties had their newspapers. The Daily Courant, the first daily newspaper published in Britain, made its appearance at London in the early part of the reign of queen Anne. The earliest newspaper published in Scotland, was issued, under the auspices of Cromwell, in 1652. The Caledonian Mercury was, however, the first of the Scottish newspapers of native manufacture; it made its appearance at Edinburgh, under the title of Mercurius Caledonius, in 1660; but its publication was soon afterwards interrupted. In 1715, a newspaper was, for the first time, attempted in Glasgow. See Chalmers's Life of Ruddiman, pp. 102—121, for some interesting researches regarding newspapers.

The stamp duty on British newspapers used to be 4*d.*, with a discount of twenty per cent., which reduced the duty actually paid to 3¼*d.* This tax brought annually to the revenue about half a million pounds sterling. In 1836, however, the duty was reduced to one penny on each newspaper, without discount; so that ordinary sized newspapers, which used to sell at 7*d.* or 7½*d.*, are now sold at 4*d.* and 4½*d.* The change in the price of the stamp came into operation on the 15th September, 1836. What effect it may have on the general economy of newspapers, is yet to be seen.

Advertisements form a considerable source of profit to newspapers; and without this source, some of the most widely circulated of them could not support their great expenditure. Each advertisement is now charged, without distinction of length, with a government duty of 1*s.* 6*d.*; but until 1833 the duty was 3*s.* 6*d.*

In drawing a comparison between the newspapers of the three freest countries, Britain, France, and the United States of America, we find, as we have just said, those of the last country to be the most numerous, while some of the French papers have the largest subscription; and the whole establishment of a first-rate London paper is the most complete. Its activity is immense. When Canning sent British troops to Portugal, in 1826, we know that some papers sent reporters with the army. The zeal of the New York papers also deserves to be mentioned, which sent out their news-boats, even fifty miles to sea, to board approaching vessels, and obtain the news that they bring. The papers of the large Atlantic cities are also remarkable for their detailed accounts of arrivals, and the particulars of shipping news, interesting to the commercial world, in which they are much more minute than the English. From the immense number of different papers in the United States, it results that the number of subscribers to each is limited, 2000 being considered a respectable list. One paper, therefore, is not able to unite the talent of many able men, as is the case in France. (See the article *Constitutionnel.*) There men of the first rank in literature or politics occasionally, or at regular periods, contribute articles. In the United States, few papers have more than one editor, who generally writes upon almost all subjects himself. This circumstance necessarily makes the papers less spirited and able than some of the foreign journals, but is attended with this advantage, that no particular set of men is enabled to exercise a predominant influence by means of these periodicals. Their abundance neutralizes their effects. Declamation and sophistry are made comparatively harmless by running in a thousand conflicting currents. How different would be the case if there existed in the United States but a few papers, with from 25 to 30,000 subscribers, and five times as many readers! It seems to us highly necessary for France to render the papers in the departments more important, and to counteract the overwhelming influence of a great city like Paris, always injurious to the free action of liberty. The leading French papers differ much from those of Britain and the United States, by the absence of advertisements, while some American papers allow little space to any thing else. As respects propriety of tone, generally speaking, the British, and especially the French papers, excel the American; and perhaps future ages may look upon the violence of political controversy which disfigures the journals of America in the present day with somewhat the same feeling as that with which we regard the intemperance of religious controversy at the period of the reformation. The leading spirits of that time used language which, at the present day, is mostly banished to Billingsgate.

The following account will show the gigantic apparatus of a London daily paper. The copy-right of the Times has been calculated at from £100,000 to £120,000; but it would be difficult to affix a correct value to such an establishment. If it be true that the shareholders have sometimes divided a net profit of £24,000 per annum, the capital must be estimated at a much higher rate. Employed upon each morning paper, there are an editor, a sub-editor, from ten to fourteen regular reporters, at salaries from four to six guineas per week, each; from thirty to thirty-five compositors in the printing-office; one or two readers, who correct the proofs as they come from the compositors; a reading-boy, whose duty it is to read the copy aloud, whilst the reader makes his corrections upon the proof; a printer; and a certain number of men and boys to attend to the printing machine, and to take off the papers as they fall from the cylinders; a publisher and sub-publisher; two or more clerks in the office, to receive advertisements and keep the accounts; a porter, a number of errand boys, &c. The salary of an editor, upon a respectable morning paper, is from £600 to £1000 per annum; and a sub-editor receives from £400 to £600 per annum. Besides the regular reporters of a newspaper, there are several occasional, or, as they are called, "penny a line" reporters; from the circumstance of their furnishing articles of intelligence at a fixed price per line, vis., 1¼d. or 1½d. They are not attached to any particular newspaper. The aggregate charge for copy furnished by these persons forms a considerable item in the weekly expenditure of a newspaper. The salaries paid by a first-rate morning paper weekly, to its editors, reporters, and others on the establishment, do not amount to less than £180 per week; and if to this be added the expenditure for occasional reporting, for assistance to the compositors, for foreign newspapers, and private correspondence, and various items which it is unnecessary to enumerate, we have a weekly expense of nearly £250. The chief editor's duty begins, strictly speaking, with the publication of the evening newspapers. He has to read their leading articles, and to refute or support their arguments. He remains at his post until a late hour, prepared to write comments on the foreign papers as they arrive (a duty in which he is generally assisted by his sub-editor), and to direct, in a leading article, attention to any topic of interest before the public. During the sitting of parliament, he is compelled frequently to remain at the office until two or three o'clock in the morning; and such is the energy with which the public press in the metropolis is directed, that it is not rare to see a leading article of nearly a column, written at two o'clock in the morning, on some subject which had been discussed an hour or two previously in the house of commons. The most extraordinary part of a morning paper is the reporting. It has been stated that the regular reporting establishment varies in number from ten to fourteen. Most of the persons so engaged are gentlemen of education, and frequently law students. During the parliament, the sittings of which commence at four o'clock in the afternoon, the reporters of the leading papers attend by turns, one succeeding the other, according to previous arrangement, each remaining in the house for half or three quarters of an hour; and the reporters of the minor papers much longer. If the debate is not heavy, the reporter in the house of commons, when relieved, enters a small room at the end of the lobby, which has been appropriated exclusively to reporters, and there arranges his notes (which are seldom taken in short hand, as, except in particular cases, short-hand reporting, from the impossibility of finding room in a newspaper for all that a member says, is rather injurious than useful) of the speeches delivered during his turn. He then proceeds at once to the office of the newspaper on which he is engaged, and the editor's attention is directed by him to any thing of commanding interest that has transpired. His slips, as they are written, are given by the printer to the compositors, whose number, during the sitting of parliament, is generally increased; and as one reporter follows another, it is not unusual for a debate, which has terminated only at twelve o'clock at night, to be set up in type, and ready for printing by two o'clock in the morning. On the nights of prolonged debate, when the houses sit late, some of the reporters may be compelled to go back and take what is called a *double turn*. So active and able are some of the reporters, that it is not an unfrequent thing for one reporter to supply, from the notes of three quarters of an hour, to the paper upon which he is engaged, from two to three columns of closely printed matter. In obtaining intelligence by express, some of the evening newspapers have, within the last two or three years, shown almost incredible exertion. The Courier and Sun have sometimes contained the speech of the king of France, at the opening of the chamber, twenty-six or twenty-seven hours after it had been obtained by their agents in Paris. During the last invasion of Spain by the French, the Globe regularly employed couriers from Paris, many of which arrived within the twenty-four hours; and the same industry was manifested in getting up communications from Liverpool, at a time when the affairs of South America possessed interest for the English public. The "penny a line" men are to the press what the Cossacks are to a regular army. The peculiar mode in which these persons, who are probably about twenty in number, obtain the means of subsistence, is worthy of notice. When the facts upon which an article is to be manufactured, have been collected, the reporter, by means of a paper, something between silver and bank paper, called *flimsy*, and prepared sheets of silk covered over with a thick coating of printer's ink, and dried, makes seven or eight copies for the several morning or evening newspapers. This is attended with very little trouble. The black and white sheets are placed alternately; the reporter writes on the upper paper with a piece of steel or glass, not too finely pointed, so that the paper may not be cut, and with a moderate degree of pressure the ink is transferred from the black to the white sheets, and he obtains seven or eight perfect copies. To each of these copies he affixes his name, and then sends them round to the newspaper offices to take the chance of their insertion. If the subject of the report is thought interesting, he is well paid; for a report of half a column, in each of the morning papers, will produce him, in the whole, more than £3 3s. From the competition, however, among these gentlemen, and the prudence of some editors as to the use of reports so furnished, it is seldom, indeed, that they are so fortunate.

A comparison of the number of periodicals and inhabitants of different countries gives the following results:—In 1827, there appeared, in Great Britain, 483 different newspapers and other periodicals to 23,400,000 inhabitants; in the United States, 802 newspapers, &c. to 11,600,000 inhabitants; in Sweden and Norway, 82 journals to 3,866,000 inhabitants; in the States of the Church, 6 newspapers to 2,598,000 inhabitants. (Stockholm, with 78,000 inhabitants, has 30 journals; Rome, with 154,000, only 3.) Denmark, to 1,950,000 inhabitants, has 80 journals, of which 71 are in the Danish language; 23 are devoted to politics, 25 to the sciences. Prussia has 12,416,000 inhabitants, and 288 journals and periodicals. (Berlin has 221,000 inhabitants, and 53 periodical works; Copenhagen has 109,000 inhabitants, and 57 journals.) The Netherlands have 6,143,000 inhabitants, and 150 journals. In the German confederation (excluding Austria and Prussia), there are 13,300,000 inhabitants, and 305 journals; in Saxony, to 1,400,000 inhabitants, 54 newspapers; in Hanover, to 1,550,000 inhabitants, 16 newspapers; in Bavaria, to 3,960,000 inhabitants, 48 newspapers. France, with a population of 32,000,000, has 490 periodical works (660 printing establishments, 1500 presses; in Paris, 81 printing establishments, or 850 presses). In Paris alone, containing 890,000 inhabitants, there are 176 periodical works.—As curiosities in this branch of literature, we may mention the newspaper established in Egypt by authority of Mohammed Pacha, printed at Boulac, near Cairo, and containing a report of all public transactions of consequence. February 21, 1828, appeared the first number of the Cherokee Phœnix, a weekly paper, published at New Echota, Georgia, partly in English, partly in Cherokee Indian. In British India six gazettes are published in the Bengal dialect.

NEWSTEAD ABBEY, celebrated as the residence of lord Byron, is situated in Nottinghamshire, 136 miles north-west of London, four miles from Mansfield. It was an Augustin monastery, founded by Henry II., and granted to John Byron by Henry VIII., at the time of the suppression of the monasteries. It has continued in the family ever since. Though much fallen to decay, it is still completely an abbey, and the greatest part of it is still standing in the same state as when it was first built. There are two tiers of cloisters, with numerous cells and rooms, and many of the original rooms are still in use. Of the abbey church, only one end remains. The house and gardens are entirely surrounded by a wall, with battlements; in front is a large lake, bordered with castellated buildings; all this is surrounded with bleak and barren hills, with scarce a tree to be seen for miles. Lord Byron, in his will, directed it to be sold. The "uses vile" to which it was condemned by the noble bard, seem but too truly depicted in his Childe Harold (i. 7).

> Monastic dome! condemned to uses vile!
> Where superstition once had made her den,
> Now Paphian girls were known to sing and smile;
> And monks might deem their time was come agen,
> If ancient tales say true, nor wrong these holy men.

NEW STYLE. See *Calendar*, and *Epoch*.

NEW TESTAMENT. See *Bible*.

NEWTON, Sir Isaac, the most distinguished mathematician and philosopher of modern times, was born at Woolsthorpe, in Lincolnshire, December 25, 1642 (O. S.), and, at his birth, was so small and weak that his life was despaired of. On the death of his father, which took place while he was yet an infant, the manor of Woolsthorpe became his heritage. His mother sent him, at an early age, to the village school, and, in his twelfth year, to the town of Grantham. While here, he displayed a decided taste for philosophical and mechanical inventions; and, avoiding the society of other children, provided himself with a collection of saws, hammers, and other instruments, with which he constructed models of many kinds of machinery. He also made hour-glasses acting by the descent of water; and, a new wind-mill, of a peculiar construction, having been erected in the town, he studied it until he succeeded in imitating it, and placed a mouse inside, which he called the *miller*. Some knowledge of drawing being necessary in these operations, he applied himself, without a master, to the study; and the walls of his room were covered with all sorts of designs. After a short period, however, his mother took him home, for the purpose of employing him on the farm, and about the affairs of the house, and sent him, several times, to market, at Grantham, with the produce of the farm. A trusty servant was sent with him, and the young philosopher left him to manage the business, while he himself employed his time in reading. A sun-dial which he constructed, on the wall of the house at Woolsthorpe, is still shown. This irresistible passion for study and science finally induced his mother to send him back to Grantham, where he remained till his eighteenth year, when he was entered at Trinity college, Cambridge (1660). A taste for mathematical studies had, for some time, prevailed there; the elements of algebra and geometry usually formed a part of the course, and Newton had the good fortune to find the celebrated doctor Barrow professor. In order to prepare himself for the lectures, Newton read the text-books in advance: these were Sanderson's Logic and Kepler's Treatise on Optics; the Geometry of Descartes was also one of the first books that he read at Cambridge. He next proceeded, at the age of about twenty-one, to study the works of Wallis, and appears to have been particularly delighted with the celebrated treatise of that author entitled *Arithmetica Infinitorum*. Wallis had given the quadrature of curves whose ordinates are expressed by any integral and positive power of $1—x^2$, and had observed that if, between the areas so calculated, we could interpolate the areas of other curves, the ordinates of which constituted, with the former ordinates, a geometrical progression, the area of the curve, whose ordinate was a mean proportional between 1 and $1—x^2$, would express a circular surface, in terms of the square of its radius. In order to effect this interpolation, Newton began to seek, empirically, the arithmetical law of the co-efficients of the series already obtained; and, having done this, he rendered it more general by expressing it algebraically. Perceiving that this interpolation gave him the expression, in series, of radical quantities, composed of several terms, he directly verified this induction by multiplying each series by itself the number of times required by the index of the root, and found, in fact, that this multiplication reproduced exactly the quantity from which it had been deduced. Having thus ascertained that this form of series really gave the development of radical quantities, he was led to consider that they might be obtained still more directly, by applying to the proposed quantities the process used in arithmetic for extracting roots. This gave him, again, the same series, but made them depend on a much more general method, since it permitted him to express, analytically, any powers whatever of polynomials, their quotients, and their roots, by considering and calculating these quantities as the developments of powers corresponding to integral negative, or fractional exponents. Indeed, in the generality and in the uniformity given to these developments the discovery of Newton really consists; for Wallis had remarked before him, with regard to monomial quantities, the analogy of quotients and roots with integral powers, expressed according to the notation of Descartes; and Pascal had given a rule for forming, directly, any term of the development of binomial powers, the exponent being an integer. Thus was discovered the celebrated formula, known as Newton's Binomial Theorem (q. v.). Newton further perceived, that there is hardly any analytical research, in which the use of it is not necessary, or at least possible, and immediately made a great number of the most important applications of it. Thus he obtained the quadrature of the hyperbola, and of many other curves, and also extended his formulæ to the surfaces of solids, the determination of their contents, and the situation of their centres of gravity. Wallis, in his *Arithmet. Infin.* (1665), had shown that the area of all curves may be found, whose ordinate is expressed by any integral power of the *abscissa*, and had given the expression for this area in terms of the ordinate. Newton, by reducing into series the more complicated functions of the *abscissa*, which represent the ordinates, changed them into a series of monomial terms, to each of which he was able to apply the rule of Wallis. He thus obtained as many portions of the whole area as there were terms, and, by their addition, obtained the total. But the far more extensive, and, in some respects, unlimited applications that Newton made of this rule, depended on a general principle, which he had made out, and which consisted in determining, from the manner in which quantities gradually increase, what are the values to which they ultimately arrive. To effect this, Newton regards them, not as aggregates of small homogeneous parts, but as the results of continued motion, lines being considered as described by the movement of points, surfaces by that of lines, solids by that of surfaces, and angles by the rotation of their sides. Again, considering that the quantities so formed are greater or smaller, in equal times, according as the velocity with which they are developed is more or less rapid, he endeavours to determine their ultimate values from the expression for these velocities, which he calls *fluxions*, naming the quantities themselves *fluents*. In fact, when any given curve, surface, or solid, is generated in this manner, the different elements which either compose or belong to it, such as the ordinates, the abscissas, the lengths of the arcs, the solid contents, the inclinations of the tangent planes, and of the tangents, all vary, differently and unequally indeed, but nevertheless according to a regular law, depending on the equation of the curve, surface, or solid under consideration. Hence Newton was able to deduce from this equation the fluxions of all these elements, in terms of any one of the variables, and of the fluxion of this variable, considered as indeterminate; then, by expanding into series, he transformed the expression, so obtained, into finite or infinite series of monomial terms, to which Wallis's rule became applicable; thus, by applying it successively to each, and taking the sum of the results, he obtained the ultimate value, that is, the fluent of the element, which he had been considering. In this consists the method of fluxions, of which Newton, from that time, laid the foundation, and which, eleven years later, Leibnitz again discovered, and presented to the world in a different form,—that of the differential calculus. Newton made these important discoveries before completing his twenty-third year, and collected them in a manuscript, entitled *Analysis per Æquationes Numero Terminorum infinitas*, but did not communicate them to any one.

About this time (1665), being obliged to quit Cambridge on account of the plague, he retired to Woolsthorpe, and now turned his attention more closely to subjects of natural philosophy. As he was one day sitting under an apple-tree, the fall of an apple led him to reflect on the nature of that remarkable principle which urges all bodies towards the centre of the earth. "Why," he asked himself, "may not this power extend to the moon? and, if so, what more would be necessary to retain her in her orbit about the earth?" He considered that if the moon was retained about the earth by terrestrial gravity, the planets, which move round the sun, ought, similarly, to be retained in their orbs by their gravity towards that body. Setting out with the law of Kepler, that the squares of the times of revolution of the different planets are proportional to the cubes of their distances from the sun, Newton found, by calculation, that the force of solar gravity decreases proportionally to the square of the distance; and having thus determined the law of the gravity of the planets towards the sun, he endeavoured to apply it to the moon; that is, to determine the velocity of her motion round the earth by means of her distance, as settled by astronomers, and of the intensity of gravity, as shown by the fall of bodies at the earth's surface. To make this calculation, it is necessary to know exactly the distance from the surface to the centre of the earth, expressed in parts of the same measure that is used in marking the spaces described, in a given time, by falling bodies at the earth's surface; for their velocity is the first term of comparison that determines the intensity of gravity at this distance from the centre, which we apply afterwards at the moon's distance, by diminishing it proportionably to the square of the distance. It then remains only to be seen if gravity, when thus diminished, has precisely the degree of energy necessary to counteract the centrifugal force of the moon, caused by her observed motion in her orbit. Unfortunately, at that time, there existed no correct measure of the earth's dimensions. (See *Degrees, Measurement of.*) Newton was obliged to employ the imperfect measures then in use, and found that they gave for the force which retains the moon in her orbit, a value greater by one-sixth than that which results from her observed circular velocity. This small difference seemed, to his cautious mind, a strong proof against his bold conjecture. He imagined that some unknown cause modified, in the case of the moon, the general law of gravity indicated by the motion of the planets. Yet he did not abandon his leading notion, but determined to wait till study and reflection should reveal to him this supposed unknown cause. In 1666, he returned to Cambridge, was chosen fellow of his college (Trinity college) in 1667, and, the next year, was admitted A. M.; but he did not disclose his secrets even to his instructer, doctor Barrow. In 1668, however, Mercator published his *Logarithmotechnia*, in which he had obtained the area of the hyperbola referred to its asymptotes, by expanding its ordinate into an infinite series, which was the main secret of Newton's method. Barrow showed this work to Newton, who immediately gave him his own treatise (the Analysis. &c), but did not yet publish it.

In the course of 1666, his attention had been accidentally drawn to the phenomena of the refraction of light through prisms. His experiments led him to conclude that light, as it emanates from the radiating bodies, is not a simple and homogeneous substance, but that it is composed of a number of rays, endowed with unequal refrangibility, and possessing different colouring properties. More than two years elapsed before he returned to his researches on this subject; but, in 1669, being appointed professor of mathematics, and preparing to lecture on optics, he endeavoured to mature his first results, and composed a complete treatise, in which the fundamental properties of light were unfolded, established, and arranged by means of experiments alone, without any mixture of hypothesis—a novelty at that time almost as surprising as these properties themselves. Thus it appears, that the three great discoveries which form the glory of his life, the method of Fluxions, the Theory of Universal Gravitation, and the Decomposition of Light,—were conceived before the completion of his twenty-fourth year.

In 1672, Newton was chosen a fellow of the royal society, to which he communicated a description of a new arrangement for reflecting-telescopes, which rendered them more convenient by diminishing their length without weakening their magnifying powers, and, soon after, the first part of his labours on the analysis of light. When the first feelings of surprise and admiration, excited by this noble work, had subsided, the society appointed three members to study it fully, and report upon it. Hooke, a man of extensive acquirements and an original turn of thought, but of excessive desire of renown, being one of the members, undertook to draw up the report. Instead of discussing the new facts, as presented by the experiments of Newton, he examined them merely in relation to a hypothesis of his own—that light is simply the effect of vibrations excited and propagated in an elastic medium—and concluded by allowing whatever appeared reconcilable with his own hypothesis, and by advising Newton not to seek any other explanation of the facts. Newton in reply (*Phil. Trans.*, vii.), after exposing some errors of Hooke, adduces new experiments confirming his former results, and refutes the objections to the production of whiteness by the mixture of all the rays. To several other attacks (particularly one by Huygens), which appeared in the Philosophical Transactions, and which were conducted on similar principles, he was obliged to reply. In vain did he declare that he neither advanced nor admitted any hypothesis whatever, and that his sole object was to establish and connect facts by means of the laws of nature. This severe and abstract method of reasoning was little understood, and it is hardly conceivable into what minuteness of detail he was obliged to enter. So much was he disgusted with these difficulties, that he gave up his intention of printing his lectures on Optics with his treatise on Series. Before quitting the lists, however, he addressed another paper (1675) to the royal society, completing the account of his results, and of his views on the nature of light. This treatise, united with his first paper on the analysis of light, afterwards served as the base of the great work, Treatise on Optics (1704), in which, however, the experimental investigation of the phenomena is more extensive, and more strictly separated from all hypothesis. The new experiments with which it was enriched, relate principally to the colours observed in thick plates of all bodies, when they are presented, in a proper manner, to the incident ray. Newton reduced them to the same laws as those of the phenomena in thin plates; and then, considering these laws as established facts, equally certain with the particular experiments from which they are deduced, yet far more universal, he unites them all in one general property of light, each peculiarity of which is characterized with such exactness as to make the general property a pure expression for all the observed laws. The essence of this property is, that each particle of light, from the instant when it quits the radiating body whence it emanates, is subject, periodically, and at equidistant intervals, to a continual alternation of dispositions, to be reflected from, or transmitted through, the surfaces of the diaphanous bodies which it meets with; so that, for instance, if such a surface presents itself to the luminous particle during one of the alternations, when the tendency to reflection, which Newton called the "fit of easy reflection," is in force, this tendency makes it yield more easily to the reflecting power of the surface, while, on the other hand, it yields with more difficulty when it is in the contrary phase, which he termed the "fit of easy transmission." (See *Light and Optics*.) In his paper of 1675, after excusing himself for proposing a conjecture as to the nature of light, and declaring that it had no connexion with the facts which he had discovered, he goes on to give one which he should be inclined to consider most probable, if he were obliged to adopt any. He then admits the existence of an imperceptible fluid (which he calls *æther*), extending everywhere in space, and penetrating all bodies with different degrees of density. This fluid he considers as highly elastic, and, consequently, pressing against itself and the material parts of other bodies, with an energy proportional to its actual density. If this æther be disturbed or agitated, in any one point, by any cause which produces a vibratory motion, this motion must transmit itself, by undulations, through all the rest of the medium; and if these undulations encounter, in their passage, the material particles forming the substance of any body, they will agitate them with considerable force. Now, light, he admits, consists of a peculiar substance, different from the æther, but composed of heterogeneous particles, which, darting in all directions from luminous bodies, with great velocity, agitate the æther in their passage, and excite undulations. He does not attempt to determine the essence of these particles.

From this time till 1679, Newton communicated nothing to the royal society, and in this interval appears to have been occupied with astronomical observations. In that year he had occasion to write to Hooke about a system of physical astronomy, on which the royal society had asked his opinion. In his letter he proposed, as a matter deserving attention, to verify the motion of the earth by direct experiment, viz. by letting bodies fall from a considerable height, and observing if they follow exactly in a vertical direction; for if the earth turns, since the rotary velocity at the point of departure must be greater than at the foot of the vertical, they will be found to deviate from this line towards the east, instead of following it exactly, as they would do if the earth did not move. Hooke replied, that wherever the direction of gravity is oblique to the axis of the earth, bodies in falling change parallels, and approach the equator. This led Newton to consider whether the elliptical motion of the planets could result from a force varying inversely as the square of the distance, and, if so, under what circumstances such a result would ensue. In proposing his experiment to the society, he had considered the motion of the heavy body as determined by a force of constant intensity, and had concluded the trajectory to be a spiral, doubtless because he imagined the body to fall in a resisting medium, such as the air. Hooke replied, that it should not be a spiral, but that in a vacuum it would be an eccentric ellipse, which, in a resisting medium, would change into an eccentric ovoidal curve; and he represented the eccentric ellipse as the consequence of a force inversely proportional to the squares of the distances from the earth's centre. Newton, having examined this result by mathematical calculations, found that an attractive force, emanating from a centre, and acting inversely as the squares of the distances, would produce motions exactly resembling the planetary motions, both in regard to the form of the orbit and the velocity of the body at each point. This was the secret of the system of the world; but it still remained to account for the discordance of the moon's motion, which had before (1665) embarrassed Newton. But, in 1682, having learned the results of the new measurement of a degree by Picard, he resumed his former calculations from these data. Finding, as he advanced, the manifest tendency of these numbers to produce the long-desired results, he became so much agitated as to be unable to go on with his calculation, and requested one of his friends to finish it. Two years were spent in penetrating the consequences of this discovery, and preparing his immortal work, *Philosophiæ Naturalis Principia Mathematica*, during which time he lived only to calculate. He would sometimes rise, and, suddenly arrested by some new conception, would sit on his bedside for hours together, and would forget his meals, unless reminded of the necessity of taking nourishment. It was not till 1686, that he finally concluded to present his work to the society, at the expense of which it was printed in 1687. Not more than two or three of his contemporaries were capable of understanding it, and more than fifty years elapsed before the great physical truth which it contained was thoroughly understood by the generality of scientific men.

In 1687, Newton was one of the delegates sent by the university of Cambridge, to maintain its rights before the high commission court, when they were attacked by James II., and, in 1688, was elected, by the university, to the convention parliament, but never distinguished himself in that body. He had always taken great interest in chemistry, and occupied himself occasionally with experiments in that science. He had constructed a small laboratory for prosecuting his investigations, and seems, after the publication of the *Principia*, to have devoted almost his whole time to them. One morning (1692), he had accidentally shut up his little pet dog Diamond in his room, and, on returning, found that the animal, by upsetting a candle on his desk, had destroyed the labours of several years. On perceiving his loss, he only exclaimed, "Oh, Diamond! Diamond! you little know the mischief you have done." But the grief caused by this circumstance injured his health, and, M. Biot endeavours to show, for some time impaired his understanding. This fact of a derangement of his intellect, according to Biot, explains why Newton, though only forty-five years old when the *Principia* was published, never after gave to the world a new work in any branch of science, and merely published some which had been previously composed. Doctor Brewster, however, refutes this notion.

In 1696, he was appointed warden of the mint, a general recoinage having then been undertaken. In this office, he rendered essential service, and, in 1699, was made master of the mint. In 1701, he was again returned to parliament by his university; in 1703, he was chosen president of the royal society; and, in 1705, was knighted by queen Anne. In 1704, he gave to the world his Optics (in English; translated into Latin by doctor S. Clarke), which contains all his researches on light. The whole merit of this extraordinary work has not been fully appreciated till within a few years. Other works, published about this time, were his *Arithmetica Universalis* (1707; more complete, 1712); *Methodus Differentialis* (1711); and his *Analysis per Equationes Numero Terminorum infinitas* (1711). We have already given an account of the celebrated dispute between Newton and Leibnits (1712), in the article *Leibnitz*. (See the *Commercium Epistolicum*, or Collection of Letters, published by the Royal Society in 1712.) The princess of Wales (daughter-in-law of George I.), a woman of a cultivated mind, had received Newton with great kindness, and was fond of conversing with him. Newton having one day explained to her a system of chronology which he had composed for his amusement, she requested a copy for her own use. A copy was also given to abbé Conti, who immediately published it without Newton's knowledge; and it therefore became necessary to prepare a more correct edition, which appeared in 1728, under the title Chronology of Ancient Kingdoms amended. His observations upon the Prophecies of Holy Writ (1733) is an attempt to show the fulfilment of the prophecies. In his Historical Account of two notable Corruptions of the Scriptures, he discusses the two passages in the Epistles of St John and St Paul, relating to the Trinity, which he supposes to have been altered by copyists.

At this period of his life, the reading of religious works, with the conversation of his friends, formed almost his only amusement, after performing the duties of his office. He had almost ceased to think of science; and, during the last ten years of his life, when consulted about any passage in his works, he would reply, "Ask Mr De Moivre; he knows better than I do." When his friends expressed their admiration of his discoveries, he said, "To myself I seem to have been as a child playing on the sea-shore, picking up a pebble here and there, while the immense ocean of truth lay unexplored before me." His countenance was rather calm than expressive; his manner, rather languid; his health was good until his eightieth year, when he suffered from a calculous disorder, which occasioned his death March 20, 1726—7. His corpse lay in state, in Jerusalem chamber, Westminster, and, on the 28th, was interred in Westminster abbey. A monument was erected to his memory, by his family, with an inscription ending with these words, applicable to Newton only: *Sibi gratulentur mortales tale tantumque exstitisse humani generis.*[*] His statue, by Roubiliac, stands in his college, at Cambridge. Horsley's edition of his Works (5 vols., 4to, 1779—85), with the *Opuscula*, collected by Castillon (3 vols., 4to, Lausanne, 1744), and his letters, inserted in the *Biographia Britannica*, contains nearly all his printed works.[†] Pemberton's View of Newton's Philosophy (1728), and Maclaurin's Account of Newton's Discoveries, are valuable works.—See, also, Birch's *History of the Royal Society* (vol. 3d). The best edition of the *Principia* is that of Lesueur and Jacquier (4 vols., 4to, Geneva, 1739—42; 4 vols., 8vo, Glasgow, 1822). A Life of Newton, by doctor Brewster, appeared in 1831. The article *Newton*, in the *Biographie Universelle*, by M. Biot, is very complete. The Collections for the History of Grantham, with authentic Memoirs of Sir Isaac Newton, contains much important matter.

NEWTON, Thomas, an English Theological writer, born at Lichfield in 1703, was educated at Trinity college, Cambridge, where he obtained a fellowship. In 1744, he obtained the rectory of St Mary-le-Bow, London, and, in 1745, took the degree of D.D. He published an edition of the Paradise Lost of Milton, with notes, and a memoir of the author, in 1749; and he afterwards edited, in a similar manner, the Paradise Regained. But his literary reputation depends chiefly on his Dissertations on the Prophecies (1759, 3 vols., 8vo), several times reprinted. In 1761, doctor Newton was made bishop of Bristol, and afterwards obtained the deanery of St Paul's, which he held till his death (1782.) His works were published with an autobiographical memoir (2 vols., 4to).

NEW WORLD; a name frequently applied to the Americas, not because they are supposed to have been of a later origin than the eastern hemisphere, or the Old World, but because they became known to the Europeans at a comparatively recent date.

NEW YEAR'S DAY; the first day of a year.

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[*] Pope's epitaph on Newton is well known:—

Isaacus Newton hic jacet,
Quem immortalem cæli, natura,
Tempus ostendunt.
Mortalem hoc marmor fatetur.

Nature and all her works lay hid in night,
God said, Let Newton be,—and all was light.

[†] The manuscripts, letters, and other papers of Newton, have been preserved in different collections. His correspondence with Cotes, relative to the second edition of the *Principia*, and amounting to between sixty and a hundred letters, a considerable portion of the manuscript of that work, and two or three letters to doctor Keill, on the Leibnitzian controversy, are preserved in the library of Trinity college, Cambridge. Newton's letters to Flamstead, about thirty-four in number, are deposited in the library of Corpus Christi college, Oxford. Several letters of Newton, and, we believe, the original specimen which he drew up of the *Principia*, exist among the papers of Mr William Jones (the father of Sir William Jones), which are preserved at Shirburn castle, in the library of lord Macclesfield. But the great mass of Newton's papers came into the possession of the Portsmouth family, through his niece, lady Lymington, and have been safely preserved by that noble family. There is reason to believe that they contain nothing which could be peculiarly interesting to science; but as the correspondence of Newton with contemporary philosophers must throw considerable light on his personal history, we trust that it will, ere long, be given to the public.—Brewster's *Life of Newton*.

(Respecting the determination of the same, see *Year*, and *Epoch*.) We shall treat of it in this place as a festival. It is natural for man to distinguish this day, which begins one of the great divisions of his life, with particular usages. We find this to be the case with most civilized nations. The new year of the Jews began with the month *Tishri*. It was considered as the day on which God holds judgment (hence *Jom Haddin*, day of judgment), and also as the anniversary of the day on which Adam was created.—The Romans offered sacrifices on new year's day to Janus, particularly a white steer. In the whole city, much incense was burned, and the newly elected magistrates went in procession to the capitol, where they sacrificed to Jupiter. The success of any affair on that day was considered a good omen for the whole year. People who met greeted each other with *Annum novum faustum felicemque tibi*. Presents given were called *xenoi*, and those returned, *apophoreta*, *strenæ*. They consisted chiefly of gilt dates, dried and gilt plums and figs, honey, rare coins, spoons, lamps, ornamented with a head of Janus. The emperors made these presents a heavy tax: Caligula, for instance, received them during the whole day, standing in the ante-chamber of his palace, from the high officers. Claudius abolished this burdensome obligation. Henry III., king of England, seems to have imitated the Roman emperors in extorting new year's presents; and queen Elizabeth, according to doctor Drake, principally supported her jewel chest and her enormous wardrobe by levying similar contributions. Even her majesty's household servants offered such presents; and, among others, the dustman is recorded as having presented her with two bolts of cambric. The 3000 gowns, mentioned in D'Israeli's Curiosities of Literature, as having been found in her wardrobe at her decease, show that the tax must have been heavy. These presents, however, were, doubtless, often given on the old principle *do ut des*. The Druids of ancient Britain were accustomed, on certain days, to cut the sacred mistletoe with a golden knife, in a forest dedicated to the gods, and to distribute its branches with much ceremony, as new year's gifts, to the people. Among the Saxons, this day was also observed by gifts, accompanied with festivities; and they reckoned their age by the number of these merrymakings at which they had been present. Similar customs existed with other German tribes, accompanied by many superstitious observances, so that many laws of Charlemagne are found to be directed against them; and to this very day, a number of ceremonies, originally superstitious, but now serving principally to excite mirth, are practised in Germany, on the night of the last of December and first of January. Among the most common, at present, is the melting of tin or lead, which is thrown at midnight into a basin of water, when it will form strange figures, which serve for divination. New year of the Christians, being the eighth day after Christmas, is the festival of Christ's circumcision. The day is a holiday, celebrated with religious service all over the European continent. In England, it is not, nor in the United States, where the aversion of the Puritans to religious festivals, and other causes, prevented their introduction. They were even prohibited in some of the American colonies, by severe laws. At an early period, most Christians celebrated new year on our 25th of March (the conception of Mary). In Germany, this was the case till the ninth century. At a later time, it was changed to December 25, and so continued in Germany until the fourteenth century, and in England even to 1752. Of modern nations, the French celebrate new year with the most spirit. Smith, in his Games and Festivals, says, that it has been estimated that the amount expended upon *bon-bons* and sweetmeats alone, for presents on new year's day, in Paris, exceeds £20,000 sterling, while the sale of jewelry and fancy articles in the first week of the year is computed at one fourth of the sale during the whole twelve months. In Germany, presents are universally given on Christmas eve. In England, new year's presents are not so frequent, and the souvenirs, and other works of light literature, professedly intended for such presents, are in circulation so early, that they are stale before new year arrives. In New York, a custom exists (probably a remainder of Dutch manners) of paying visits of congratulation on new year's day. Good store of cookies (Dutch, *koek*, cake) are provided for the entertainment of the visitors. As it is considered the duty of gentlemen to visit all the ladies of their acquaintance on this occasion, it may easily be imagined that the day is one of considerable stir in fashionable society.

NEW YORK; one of the thirteen original states of the American confederacy.

Boundaries, &c. This state is bounded north by Upper and Lower Canada, east by Vermont, Massachusetts, and Connecticut, south by New Jersey and Pennsylvania, and west by Pennsylvania, lake Erie, and the Niagara river. The territory of this state is situated between lat. 40° 30′ and 45° N., and between lon. 5° 5′ E. and 2° 55′ W. from the city of Washington. Its extreme length from east to west, including Long Island, is about 408 miles; exclusive of it, 340 miles. Its greatest breadth from north to south is about 310 miles; its area 45,658 miles. The estimate includes the whole surface, except the waters of the great lakes. The territory now constituting the state of Vermont was included within the limits of the colony of New York, and was claimed as a part of this state until 1790, when New York gave her assent to the erection of the present state of Vermont.

Civil Divisions. It is divided into fifty-six counties, namely, New York, King's, Queen's, Richmond, Suffolk, Westchester, Dutchess, Putnam, Orange, Rockland, Ulster, Sullivan, Delaware, Greene, Columbia, Albany, Rensselaer, Schenectady, Schoharie, Montgomery, Hamilton,* Saratoga, Washington, Warren, Essex, Clinton, Franklin, St Lawrence, Jefferson, Lewis, Herkimer, Oneida, Madison, Oswego, Otsego, Chenango, Broome, Cortlandt, Tompkins, Tioga, Steuben, Onondaga, Cayuga, Seneca, Ontario, Yates, Wayne, Livingston, Monroe, Orleans, Genesee, Alleghany, Niagara, Erie, Cattaraugus, and Chautauqua. In this enumeration, we have commenced with the most south-eastern counties, and proceeded north and west. These counties are subdivided into five cities, namely, New York, Albany (the seat of government), Troy, Hudson, and Schenectady, and 764 towns. There are 101 incorporated villages, many of which have names differing from the towns in which they are situated: thus the flourishing village of Rochester is in the towns of Yates and Brighton, Geneva in the town of Seneca, &c. Besides the cities and towns already enumerated, the following may be mentioned as among the most flourishing and populous: Utica, Buffalo, Brooklyn, Canandaigua, Poughkeepsie, Auburn, Ithaca, Catskill, Newburg, &c.

Face of the Country, &c. The state may be most correctly described as an elevated tract, with indentations in various places below its general level. The most important depressions are the great basins in which are situated lakes Erie and Ontario, and the long, narrow valley which contains the Hudson river and lake Champlain. The two last are connected with each other by a valley occupied by the Mohawk river and the Oneida lake. The mountains, or elevated ground, is thus also separated into three principal divisions. The first of these occupies the space south of the Mohawk river and the Ontario valley, and between the Hudson river and lake Erie; the second is the mountain district north of the Mohawk, and between lake Champlain and the east end of lake Ontario; and the third comprises that part of the mountain range east of the Hudson which is within the boundaries of this state. The western part of the first division, or that which lies between Seneca lake and lake Erie, forms a high table-land, about 2000 feet in mean elevation, and the highest part of it is occupied by the counties of Steuben, Alleghany, Cattaraugus, and Chautauqua. From this elevation flow the Alleghany, the Susquehannah, and the Genesee rivers, respectively terminating in the gulf of Mexico, the Atlantic ocean, and the gulf of St Lawrence. Chautauqua lake, the most western of the larger lakes in this state, is 1291 feet above the level of the ocean, and 723 feet higher than lake Erie. It empties into the Alleghany. The eastern part of the first division, or the space between Seneca lake and the Hudson, south of the Mohawk, is occupied by several parallel ridges of mountains, which may be considered as continuations of the Alleghany ridge, passing out from Pennsylvania. These ridges are in a north and south direction, and their indentations give rise to several fertile valleys, particularly those of the Susquehannah, the Delaware, and their branches. The highest is the Catskill mountains, which bound the valley of the Hudson on the west. The Round Top, which is considered the highest summit of these mountains, is, according to captain Partridge, 3804 feet above the level of the tide water of the Hudson. There is also a narrow table-land on this subdivision, which merits attention from its explaining the course of rivers and lakes within it. It is situated a little south of the line of the Erie canal, and continues almost uninterruptedly from the Catskill mountains to the head of Seneca lake. On this are found Otsego and Schuyler's lakes, going to the south, and giving rise to the sources of the Susquehannah. Both of these are at an elevation of about 1200 feet. Skaneateles, Owasco, and Cazenovia lakes discharge their rivers to the north, but their elevation is several hundred feet less than that of the former. Cayuga and Seneca lakes are not highly elevated, the one being only 387 feet, and the latter only 447, above the level of tide-water. They thus occupy two long, narrow ravines, in a north and south direction, and are separated by a ridge 800 feet above Cayuga lake.

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* This county, not being separately organized, acts in conjunction with Montgomery county, and, for all political purposes, is considered a part thereof.

The second division of the mountain district is traversed by at least five or six parallel ridges passing in a north-eastern direction, and which may be considered as continuations of the Appalachian chain. Portions of them are called Kayaderossas, Sacandaga, Mayfield mountains. The highest elevation that has been ascertained with accuracy is 2686 feet, being that of a peak belonging to the ridge that passes through Herkimer and Hamilton counties and the northern part of Essex, near the sources of the Hudson.—The third division, or that part which lies on the east side of the Hudson, crosses the Hudson in the vicinity of West Point, and forms the highlands of that river. It also constitutes the dividing ridge between the Hudson and the Connecticut.

The depressions or basins in the state of New York, are equally deserving of notice. Those of lakes Erie and Ontario are parts of the great St Lawrence basin which embraces the whole of the five western lakes. Lake Erie has an elevation of 565 feet above the level of the ocean, lake Ontario of 231 feet. The river Niagara discharges the waters of the former into the latter, and on it is found that great natural curiosity which alone deserves a visit across the Atlantic. The river narrows at twenty miles below lake Erie, and the rapids then commence. A mile beyond, we come to the falls—151 feet on the Canada side, and 164 on the American. It is needless to attempt a description of their grandeur and magnificence. They must be seen by day and by moon-light, in every position, and under various conditions of the atmosphere, in order to realize even a portion of their splendour. (See *Cataract*.) The river at this place is nearly half a mile wide, and on the very brink of the precipice is situated Goat island, which contains about eighty acres of land, and, extending up the stream, divides the water. The whole length of the Niagara is thirty-five miles, and the descent from lake Erie to lake Ontario is 336 feet. If we proceed along the basin of the Ontario, we shall pass through a series of fertile countries, constituting the slope, watered by numerous rivers, which all finally empty into the lake. The Genesee is the outlet of the Canesus, Hemlock, and Honeoye lakes. The Oswego and its tributaries, the Clyde and Seneca, carry the waters of Canandaigua, Crooked, Seneca, Cayuga, Owasco, Skaneateles, Onondaga, and Oneida lakes, into lake Ontario. The eastern termination of this basin is occupied by the Mohawk, its valley winding its way at the Little falls through stupendous rocks; while, towards the north-east, the slope towards the St Lawrence, indicated by the course of the Grass, Racket, Oswegatchie, and St Regis rivers, shows it to be a continuation of that towards the lakes.—The Hudson and Champlain valley or basin is nearly in a direct line north and south. It is remarkable for its depth below the general surface of the level of the adjoining country, being elevated, at its highest part, only 147 feet above the level of tide-water in the Hudson, and fifty-four feet above the surface of the lake. The northern part contains lake George and lake Champlain, the former emptying into the latter by a descent of nearly 200 feet. The southern part includes the valley of the Hudson, and communicates with the valley of the Mohawk, its tributary, which enters it in a south-easterly direction. The Hudson rises in the northern part of the state, its extreme branches having their sources in Hamilton and Essex counties. The Mohawk rises far in the north-west, and a little west of Oneida lake. The numerous falls and rapids on these beautiful rivers are remarkable. The Trenton falls, on the West Canada creek, a branch of the Mohawk, and the Little falls and Cohoes, on the Mohawk itself, Glenn's falls, the Great falls of the Sacandaga (also a branch), Baker's falls, on the Hudson—are only a portion of the numerous depressions which not only furnish many of the most beautiful of natural objects, but also are made to minister in various ways to the prosperity and improvement of the community. From Glenn's falls to the junction of the Hudson with the Mohawk, there is a fall of 117 feet. No fact in the topography of the state of New York is more remarkable than the peculiar position of the Hudson and its branches. If we trace the course of any Atlantic river south of it, we shall find the navigation closed by the mountain chain on the west. Not so with the Hudson. It penetrates the highlands, and, after passing up some 160 miles, is met by a tributary whose sources reach nearly to the lakes. Here the happy conformity of the country is such as to permit the establishment of an artificial navigation. By the success of the Erie canal, the country, in short, though crossed by lofty mountains intersecting it from the north-east to the south-west, is, for all commercial purposes, becoming an island.

Geology and Mineralogy. On examining Mr Maclure's map illustrative of the geology of the United States, it will be seen that most of the formations of geologists exist in this state; and some of these are among the most interesting that can be investigated, either by the mineralogist or the public economist. We refer particularly to the salt and gypsum found in the western part of the state. The Onondaga salt springs (as they are usually termed) are situated at the head of the lake of the same name, about 130 miles west of the city of Albany. Though surrounded by brine springs, the waters of the lake are perfectly fresh. Plants which are found on the sea-shore are noticed here, and, in particular, the *salicornia* and *salsola*. Below the mud, or decayed vegetable matter, which constitutes the valley of these springs, a stratum of earthy marl is found, containing numerous fossil univalves, and this again appears to be succeeded by a conglomerate. The peculiar nature of the underlying rock, or rather its position, does not seem settled, and we have not room to go into the discussion concerning it. Salt is manufactured here to a large extent by the various processes of boiling, of evaporation with artificial heat, and of solar evaporation. In 1830, there were manufactured above 1,400,000 bushels. Gypsum in its various forms of earthy gypsum, selenite, and even alabaster, is found, particularly in the counties of Onondaga and Cayuga, and is extensively applied for agricultural purposes. Nor must we omit a notice of the impure limestone found in the western as well as northern parts of the state, which has been a most important aid in the construction of the canals of the state. At an early period, it was found that if burned, and mixed with proper ingredients, it would set under water, and, accordingly, has been most extensively used. Marble is obtained in large quantities from the quarries of Sing Sing for architectural purposes. Its purity evidently increases with the depth of the excavations. In noticing the prominent articles of mineral wealth, we must not pass by the vast beds of iron ore found in the counties west of lake Champlain. In 1825, there were no less than 103 iron-works, and 73 trip-hammers, in the counties constituting the fourth and fifth senate districts. The iron ore of Columbia county, in the vicinity of the Hudson, is also highly valued and extensively manufactured. Traces of other metals, as lead, silver, zinc, titanium, &c., have also been observed in various parts of the state. It is still a problem whether anthracite or bituminous coal is to be found in sufficient quantity for useful purposes within the bounds of the state. Of minerals, which may be rather deemed objects of curiosity, this state furnishes numerous varieties. This will be sufficiently illustrated when we refer to the granitic districts near New York, and on the borders of lake Champlain—the transition and secondary districts that compose the body of the state. In fossil remains, even of some of the higher animals, there is also an abundant supply for investigation.

Temperature, &c. A mass of interesting facts on this subject has been obtained, in consequence of the regents requiring annual meteorological reports from the academies under their care. These academies are situated in every part of the state; and the mean temperature of the whole thus furnishes an approximation towards the actual state of thermometric heat.

In 1826, the mean temperature of ten places, reporting complete annual tables, was	49.36
1827, the mean temperature of eighteen places was	46.48
1828, the mean temperature of twenty-four places was	49.50
1829, the mean temperature of twenty-eight places was	46.45
1830, the mean temperature of thirty-four places was	48.15
Mean of the five years,	48.00

The quantity of rain and snow has also been ascertained in a similar manner. Thus

	Inches.
in 1826, the mean rain and snow of nine places was	36.34
1827, the mean rain and snow of seventeen places was	44.29
1828, the mean rain and snow of twenty-five places was	36.74
1829, the mean rain and snow of twenty-five places was	34.88
1830, the mean rain and snow of thirty-two places was	38.85
Mean of the five years,	38.22

The highest degree of temperature noticed in these tables is +104, at which the thermometers stood in the Montgomery academy, county of Orange, July 20, 1830. Its latitude is north 41° 32′, and longitude west 74° 10′. The lowest degree noticed is —33, at which the thermometer stood in Lowville academy, county of Lewis, January 31, 1830; north latitude 43° 47′; west longitude 75° 33′. The thermometric range is thus 137 degrees. The state is, in general, very healthy.

Population, &c. Under the colonial government, the inhabitants of New York consisted principally of four classes:—1. Dutch, the descendants of the first settlers; 2. English and Scotch emigrants, and their posterity; 3. descendants of French Protestants, who took refuge in the colony on the revocation of the edict of Nantes; 4. Germans, descendants of a colony of Palatines, who, in 1709, fled to England to escape persecution in Germany, and, in the ensuing year, emigrated to New York under the patronage of the British government. On the termination of the revolutionary war, a tide of emigration set in from the New England states, which continued for many years, and to such an extent, that a majority of the present population is probably composed of natives of those states, or their descendants. Many emigrants from Ireland, and from other parts of Europe, have also been attracted to this state, and particularly to its great commercial metropolis and the flourishing towns in the interior. The influence of this varied descent is to be seen in many of the institutions and prevailing habits of the people; and it has probably tended to render the inhabitants of New York more liberal in their opinions, less wedded to particular systems, and more ready to imbibe and to follow the spirit of the age, than they might otherwise have been. Until within a few years, the German and Dutch languages were much spoken in particular districts, but both are rapidly falling into disuse. The progress of population in the territory composing the state of New York is almost unexampled, as will be seen by the following table:—Population in 1702, 20,708; in 1731, 50,259; in 1738, 60,100; in 1771, 158,893; in 1790, 340,120; in 1800, 586,050; in 1810, 959,049; in 1820, 1,372,812; in 1825, 1,616,458; in 1830, 1,919,404. In 1790, the territory west of the Seneca lake contained only 1081 souls; its population in 1830 was 406,906. According to the state census in 1825, the area was divided into acres, improved, 7,256,048; unimproved, 21,964,888 = 29,220,936, or 45,658 square miles. Population to a square mile, in 1825, nearly 35; in 1830, 42. The rapid increase of some of the cities and towns also deserves notice. New York, in 1790, contained 33,130 inhabitants; in 1810, 96,373; and in 1830, 203,009: Albany, in 1790, 3498; in 1820, 12,630; in 1830, 24,238: Troy, in 1820, 5261; in 1830, 11,605; Rochester, in 1820, 1502; in 1830, 9269; Utica, in 1820, 2972; in 1830, 8320. New York is now entitled to thirty-four representatives in the house of representatives of the United States, and to thirty-six presidential electors.

Canals. The following extensive and important communications have been constructed at the public expense, and under the direction of commissioners appointed by the state:—1. The *Erie Canal* commences at the city of Albany, and terminates at Buffalo, in the county of Erie, connecting the waters of the Hudson river with those of lake Erie. This canal was commenced in 1817, and has been in successful operation, throughout its whole extent, since 1825. It is 363 miles in length, and has 689 feet of lockage. The cost of this canal is so blended with the cost of the Champlain canal (they both having been constructed at the same time, and by the operation of the same laws), that it cannot be ascertained with accuracy, what each cost. 2. The *Champlain canal* commences at West Troy, six miles north of Albany, the point where the Erie canal turns west from the Hudson river, and terminates at Whitehall, in the county of Washington, connecting the waters of the Erie canal with those of lake Champlain. This canal is completed, and has been in successful operation since 1825. It is sixty-four miles in length, and has 188 feet of lockage. This canal has a lateral cut connecting it with the Hudson river, at Waterford, by three locks, as the Erie canal has, connecting it with the same river, opposite Troy, by two locks. The cost of these two canals, as stated by the commissioners of the canal fund, at the close of the year 1825, when they were first declared complete, was 9,267,234 dollars, 48 cents. This was exclusive of any payments of interest upon the loans which had been made to construct them, and which payments of interest then amounted to 1,507,857 dollars, 73 cents. 3. The *Oswego canal* commences at the Erie canal, at the village of Syracuse, in the county of Onondaga, and terminates at the village of Oswego, in the county of Oswego, connecting the waters of the Erie canal with those of lake Ontario. It was completed in 1828, at a cost of 565,437 dollars, 35 cents, is thirty-eight miles in length, and has 123 feet of lockage. 4. The *Cayuga and Seneca canal* commences at the Erie canal at Montezuma, in the county of Cayuga, and terminates at Geneva, in the county of Ontario, connecting the waters of the Erie canal with those of the Seneca lake. This canal has also a lateral branch to East Cayuga village, on the Cayuga lake, thus connecting the waters of this, and consequently of the Erie canal, with the Cayuga lake. Its cost, to its completion, in 1829, was 236,804 dollars, 74 cents; its length, including the lateral canal, is twenty-two miles, 704 yards, and it has eighty-three feet 6 inches of lockage. 5. The *Chemung canal* begins at the head of the Seneca lake, and terminates at Elmira, on the Chemung river, in the county of Tioga, being intended to connect the waters of the Seneca lake with the head waters of the Susquehannah river. It is to have a navigable feeder from its summit level to Painted Post, in the county of Steuben. The length of the canal is twenty-two, and of the feeder thirteen miles. The lockage upon both is about 520 feet. Contracts for their completion by the 15th day of October, 1831, were made, for the sum of 290,263 dollars. 6. The *Crooked lake canal* commences at the Seneca lake, at Dresden, and terminates at the Crooked lake, at Penyan, being intended to connect the waters of the Seneca lake with those of the Crooked lake. Its length is about six miles, 1540 yards, and its lockage is about 270 feet. Income of the public canals, in 1830: Erie canal, 954,328 dollars; Champlain canal, 78,148 dollars; Oswego canal, 12,335 dollars; Cayuga and Seneca canal, 11,987 dollars; total, 1,056,799 dollars. Disbursements: interest on canal debt, 379,695 dollars; repairs, salaries, &c., 261,656 dollars. Canal debt, January 1, 1831, 7,825,035 dollars. For the payment of this debt, the canal fund, consisting of the canal tolls, duties on salt, and on sales by auction, and several other items, is inviolably pledged. The revenue of this fund, in 1830, independently of the tolls above stated, was 383,614 dollars. The *Delaware and Hudson canal*, commenced July 1825, and completed October, 1828, was constructed by a private company, incorporated under the laws of New York and Pennsylvania. Its capital consists of 1,500,000 dollars, of which 500,000 dollars are employed in banking, in the city of New York. The credit of the state of New York was also loaned to the company to the amount of 800,000 dollars. This canal commences at the head of tide on the Rondout creek, in the county of Ulster, three miles from the Hudson river, and terminates at Honesdale, opposite the mouth of the Lackawaxan river, in Pennsylvania. Length, eighty-three miles in New York, and twenty-five in Pennsylvania. This canal being principally intended to open a communication with the coal mines in Luzerne county, Pennsylvania, a rail-road has been constructed by the company, from the head of the canal, at Honesdale, to the mines at Carbondale. Its length is sixteen miles. For further information on the canals of New York, see *Canals*.

Public Instruction, &c. Since the establishment of the state government, great exertions have been made by the legislature to extend the means of education to all classes. The appropriations made for this purpose, including the capital and income of the common school and literature funds, amount to more than 6,000,000 dollars. There are four colleges, viz., Columbia, in the city of New York; Union, at Schenectady; Hamilton, near the village of Clinton, Oneida county; and Geneva, at Geneva, Ontario county. The whole number of students in these institutions, during the year 1830, including those in the preparatory schools connected with Columbia and Geneva colleges, was 677. (For the university of New York, instituted in 1830, see the article *New York City*.) There are two medical colleges, one in the city of New York, and the other at Fairfield, Herkimer county; students in 1830, 350. There are 57 incorporated academies and seminaries, which derive from the public funds a portion of their annual support, and which had, in 1830, 4218 students. But the common schools are among the most important and interesting institutions in the state. Every town is divided into a suitable number of school districts, in each of which a school-house has been erected, and is provided with furniture and fuel, at the expense of the district. From the income of the common school fund 100,000 dollars are distributed among the school districts, according to the number of scholars therein, between the ages of five and sixteen; and the towns are required to raise, by tax, an amount equal to that received from the state, and are allowed to raise double that sum. The following is from the official reports made in January, 1831: Productive capital of the school fund, 1,696,743 dollars, 66 cents; revenue in 1830, 100,678 dollars, 60 cents; local school fund, capital not stated; income in 1830, 14,095 dollars, 32 cents; whole number of school districts, 9062, of which 8630 made returns; whole number of scholars taught in the districts making returns, 499,424, of whom 497,503 were between five and sixteen; amount of public monies received, 100,000 dollars from state treasury, 124,556 dollars, 04 cents, raised by tax on the several towns, and 14,095 dollars, 32 cents, derived from local funds possessed by certain towns, equal to 239,713 dollars, 36 cents; total amount paid for teachers' wages, 586,520 dollars; estimated amount of all expenses incurred in 1830, for the support of common schools, by the public and individuals, 1,061,699 dollars. There are two institutions for the instruction of the deaf and dumb; one in the city of New York, having, in 1830, eighty-five pupils, and one at Canajoharie, having, during the same year, twenty-nine pupils. They are chiefly supported at the public expense. There are in the state about 700 deaf mutes. The institution in the city of New York, incorporated April 15, 1817, has imparted its benefits to more than 300 pupils. Some of these pay; others are supported by the state, by the supervisors of the county, by a female association for the relief of deaf mutes, or by private charity. The edifice or asylum for the accommodation of the pupils is situated about three and a half miles from the city hall. It has accommodations for 150 pupils and the requisite number of instructers. It cost 36,000 dollars. The grounds, consisting of ten acres, are handsomely laid out, in lawns and gardens, planted with trees and shrubbery. Workshops are erected in the rear of the asylum, in which a majority of the male pupils, during the time of relief from study, spend a few hours every day, in acquiring a knowledge of some mechanical employment. Some, also, are engaged in horticulture. The female pupils, at the same time, are taught needle-work and other household duties. The pupils are divided into five classes, and furnished with large slates. The regular term of study is five years; and the annual charge for pay pupils is 130 dollars; but this charge is often reduced to meet the particular cases of applicants. The funds of the institution have been furnished by private contributions, by the legislature of the state, and by the corporation of the city. During the year 1830, the receipts were nearly 17,000 dollars. Besides the establishments above-named, there are in every part of the state, particularly the large towns and villages, numerous schools and seminaries, supported by private individuals.

Religion, &c. The constitution secures "the free exercise and enjoyment of religious profession and worship, without discrimination or preference," and accordingly most denominations of Christians, and some Jews are to be found in the state. There are a few religious corporations which are possessed of estates granted to them before the revolution, and now of considerable value; but in general the clergy are dependent for their support on the annual contributions of their respective congregations. Clergy, in 1830, Presbyterians and Congregationalists, 431; Protestant Episcopalians, 118; Baptists, 274; Reformed Dutch, 106; Methodists, 372; Lutherans, 13; various other denominations, 68; total, 1382. There are four theological seminaries in the state connected with the Protestant Episcopal, Presbyterian, Baptist, and Lutheran churches. There are two flourishing societies of Shakers; one at New Lebanon, in Columbia county, and the other at Niskauna, in the county of Albany. For an account of this sect, see *Shakers*.

Prisons and *Prison Discipline*. In each county, a public jail is established by law, the management of which, though recently somewhat improved, is yet lamentably defective. But the state prisons at Auburn and Sing Sing, the former of which now contains about 600, and the latter about 800 convicts, are models both in respect to their arrangement and discipline. The convicts are compelled to labour together in silence during the day, and are lodged in separate dormitories at night. The earnings of the convicts in the Auburn prison, during the year 1830, amounted to 40,341 dollars, and the expenses of the establishment, including repairs, &c., to 36,226 dollars. The amount received for the labour of the convicts at Sing Sing, during the same period, was 13,651 dollars, 44 cents; expenses of the prison, 53,571 dollars, 01 cents. This prison having been but recently completed, the future earnings of the convicts will probably exceed those for the year referred to.

Government, Laws, &c. By the amended constitution of this state, adopted in 1821, the legislative power is vested in a senate and assembly, the former consisting of thirty-two, and the latter of 128 members. The senators are chosen for four years, and must be freeholders. The members of the assembly are elected annually. For the election of senators, the state is divided into eight senate districts, each of which is entitled to four senators, and one of whom is annually elected in each district. The members of the assembly are elected annually. For the election of senators, the state is divided into eight senate districts, each of which is entitled to four senators, and one of whom is annually elected in each district. The members of the assembly are chosen by the several counties, among whom they are apportioned, according to a rule prescribed in the constitution. The executive power is vested in a governor, who holds his office for two years. A lieutenant governor is chosen at the same time, and for the same term. He is president of the senate, and, whenever the office of governor becomes vacant, takes the place of that officer. The right of suffrage is enjoyed by every male citizen, of the age of twenty-one years, who has been for one year an inhabitant of the state, and for six months a resident of the county where he may offer his vote. Under this liberal regulation, the number of electors is very great; in 1828, they amounted to 276,583. Sheriffs, coroners, and county clerks are elected by the people; the other civil officers are generally appointed either by the governor and senate, the two branches of the legislature, or the governor alone, except clerks of courts, district attorneys, and some other officers, who are appointed by the courts. Field officers of the militia, below the rank of major-general, are elected by the officers of their respective brigades, &c.; field officers above that rank are appointed by the governor and senate, or the governor; staff officers are appointed by their respective commanders. The judiciary consists of the following courts:—1. *The court for the trial of impeachments and the correction of errors*, composed of the president of the senate, the thirty-two senators, the chancellor, and the justices of the supreme court. This court tries all impeachments of civil officers preferred by the assembly, in whom the power of impeachment is vested, and reviews, on appeals and writs of error, the decisions of the court of chancery, and of the supreme court. But on the hearing of an appeal from a decree in chancery, the chancellor has no voice in the final sentence; and when a writ of error is brought on a judgment of the supreme court, the justices of that court have no voice for its affirmance or reversal. 2. *The court of chancery*, the powers of which are vested in the chancellor and in eight vice-chancellors. 3. *The supreme court*, consisting of a chief justice and two justices. 4. There are eight *circuit judges*, who possess the powers of a justice of the supreme court at chambers, and in the trial of issues joined in the supreme court, and in courts of oyer and terminer and jail delivery. All the circuit judges possess equity powers, as vice-chancellors, except the judge of the first circuit (that including Long and Staten islands and the city of New York), for which a vice-chancellor has been created by special law. 5. *A county court*, possessing, to a limited extent, both civil and criminal jurisdiction, is established for each county. Its decisions are liable to review in the supreme court. 6. *A surrogate* is appointed for each county, who possesses exclusive original jurisdiction in cases of wills and intestacy. 7. There are several other local courts;

as the *superior court* of the city of New York, which consists of a chief justice and two associate justices, and possesses an extensive civil jurisdiction; the *mayor's courts* and *special justices' courts*, in the several cities; and the *justices' courts* in the several towns. These latter courts are held by justices of the peace. Every town in the state has four of these officers, and each of them has the power, with a few exceptions, of trying civil suits where the amount demanded does not exceed fifty dollars. They are chosen by popular election, and hold their offices for four years, but are so arranged in classes that one is annually chosen in each town. The chancellor, justices of the supreme court, and circuit judges are appointed by the governor and senate, and hold their offices during good behaviour, or until they shall attain the age of sixty years. Judges of the county courts, surrogates, and other local judicial officers are appointed in the same manner, and for limited periods, in no case exceeding five years, but may be re-appointed. The constitution of this state not only contains several of the safeguards usually inserted in bills of rights, but has some provisions of a peculiar character; e. g.; No minister of the gospel, or priest, of any denomination whatsoever, can hold any civil or military office; all such inhabitants as, from scruples of conscience are averse to bearing arms, are entitled to be excused therefrom, on paying to the state an equivalent in money; the assent of two-thirds of the members elected to each branch of the legislature, is requisite to every bill appropriating the public property for local or private purposes, or creating, altering, or renewing any corporation; the inviolability of the common school fund is perpetually secured; the tolls on the Erie and Champlain canals, the duties on the manufacture of salt, and certain other items of revenue, are inviolably appropriated to the payment of the canal debt, and until such payment shall have been made, are incapable of reduction; the legislature are prohibited from disposing of these canals, or the salt springs, or any part thereof; and whilst the right to draw such lotteries as had already been provided for by law, is fully recognised, provision is made to prevent additional grants of this nature.

The common law of England, varied and modified from time to time, by numerous acts of the colonial and state legislatures, forms the basis of the jurisprudence of New York; and there is no one of the United States, in which the judicial institutions and the modes of legal proceeding, bear so close an analogy to those of England. At the same time, there is probably no state in the confederacy, which has made greater efforts, by means of its statutory regulations, to improve the English system, and to adapt it, both in its principles and details, to the institutions and habits of a free, intelligent, and active population. There have been, since the revolution, four several revisions of the statute laws of the state, viz. in 1787, in 1801, in 1813, and in 1827—8. The revision in 1787—8 consisted of a consolidation or re-enactment of various British and colonial statutes, with numerous amendments in form and substance; that of 1801 was a re-enactment in an amended form, of such of the former statutes as had been varied by intermediate legislation, or that seemed to require alteration; and that of 1813 was a work of the same character. But the revised statutes of 1827—8 are substantially a new code of statute law; the various general provisions of the former statutes having been written anew, in a more concise and perspicuous phraseology, and the whole work having been arranged in a systematic and methodical order. Many alterations were made in the substance of the former statutes; in numerous instances, the rules of the common law, with the view of rendering them better known and more stable, were reduced to a written text, and inserted in the statutes; whilst in other cases those rules were abolished or greatly modified, especially in reference to the law of real estate, and to the practice in the courts. The enactment of this body of statute law, which went into full operation on the 1st of January, 1830, is, perhaps, one of the most important events in the history of American jurisprudence.

History. The territory now composing the state of New York was comprehended in queen Elizabeth's grant of the tract called Virginia, and in the grants of North and South Virginia, made in 1606, by James I. But no settlement was attempted in that territory under either of those grants; nor was this part of the continent known to Europeans until September, 1609, when the river which bears his name, and the islands at its mouth, were discovered by Henry Hudson, an enterprising English navigator, then in the service of the Dutch East India company. After sailing up the river about 150 miles, he returned to Europe, and made known to his employers the result of his voyage. The Dutch immediately commenced a trade with the natives of the country, among whom were the powerful tribes afterwards known as the *Five*, and still later as the *Six Nations*. Trading establishments were soon formed by these navigators, one at fort Orange (now Albany) as early as 1613, and one on the island of Manhattan, at New Amsterdam (now the city of New York), a few years later. In 1614, the trade was confirmed by the government of Holland to the West India company, which, in 1621, was incorporated with a grant of the exclusive right to trade in America, &c., and with ample powers to establish and maintain settlements therein. Under this grant, the company took possession of the territory discovered by Hudson; gave to it the name of New Netherlands; and in 1623, commenced its colonization, which was gradually continued, for about forty years, under their auspices. During this period, the affairs of the colony were managed by a governor or director general and a council, who were appointed by the company, and in whom all the legislative, executive, and judicial powers were vested. In the mean time, new discoveries were made, and the Dutch claims extended to Connecticut river on the east, and the Delaware on the south, in consequence of which they were on both sides brought into collision with the English, who set up a title to the whole coast. May 12, 1664, Charles II. made an extensive grant to his brother, the duke of York and Albany, which included within its bounds the colony of New Netherlands. A small armament was soon after fitted out in England, for the purpose of reducing that colony. The vessels appeared in the harbour of New Amsterdam, in August, 1664, and on the 27th of that month, the fort and town of New Amsterdam, and on the 24th of September, the garrison at fort Orange, capitulated to colonel Richard Nicolls, who had been appointed by the duke of York, to take possession of the province in his behalf, with the title and powers of deputy-governor. The inhabitants thereupon submitted to his authority; the name of *New Amsterdam* was changed to *New York*, which name was also extended to the whole country; and that of *fort Orange* was altered to *Albany*. After this, the colony was in the hands of a governor and council appointed by the duke of York, until July 30, 1673, when the garrison of New York surrendered to a squadron of Dutch ships, the commanders of which appointed a governor and other magistrates, who continued in authority until February 9, 1674, when the territory was again surrendered to the British, in pursuance of the treaty of London. June 29, 1674, a new grant was made by Charles II. to the duke of York. After the accession of the latter to the throne, the colony became a part of the dominions of the British crown, and the government was administered by royal governors and a local council and assembly, until May, 1775, when the people determined to take up and exercise the power of civil government, which was accordingly done, through the medium of committees of safety and of the provincial congress, until the provisions of the state constitution, adopted in April, 1777, were carried into effect. The inhabitants of New York sustained an important part in the war of the revolution, and its territory was the scene of several sanguinary conflicts and of many interesting events. Upon the conclusion of that war, the state commenced a new and distinguished career, which has ever since been steadily continued, and some of the results of which are briefly exhibited in this article.

Authorities: Burr's *Atlas of the State of New York; Topography of the State of New York*, by professor Henry, and other articles in the Transactions of the Albany Institute (vol. i.); Darby's *Geographical Works;* doctor L. C. Beck *On the Onondaga Salt Springs;* M. H. Webster's *List of the Minerals in the State of New York;* Smith's *History of New York* (edition of New York Historical Society); Moulton's *History of the Colony of New Netherlands;* Spafford's *Gazetteer of the State of New York;* Williams's *New York Annual Register for* 1831; documents and proceedings of the legislature of New York, &c.

NEW YORK, the largest and most populous city in the United States, lies in the state of that name, and is situated at the junction of the Hudson and East rivers, at the head of the bay of New York, and about sixteen miles from the Atlantic ocean, in lat. 40° 42′ N., 74° 1′ 8″ W. lon. from Greenwich, England; and 2° 54′ 22″ E. from the city of Washington. It stands on an island formed by the two rivers just named, and a small river called *Haerlem*, which connects them. The length of this island is about fifteen miles, from south to north, and its average breadth about one mile and a half. It is separated, on the north, from the continent, by Haerlem river, which is crossed by several bridges; from New Jersey, on the west, by Hudson's river; from Long Island, on the east, by the East river; and from Staaten Island, to the south, by the bay or harbour. According to Van der Donck, who published a History of the New Netherlands, at Amsterdam, in 1656, Hudson's river was the English name of the great river coming from the north; but the Dutch "called it *Mauritius*, after prince Maurice, who then presided over the government of Holland." The Indian name of the island was *Manhattan;* the Dutch called the city *Nieuw Amsterdam;* and the British changed it to the name which it still retains. The same writer gives us the following description of the bay of New York:—"The bay on which Staaten Island is situated is the most celebrated, because the East and North rivers flow into it—rivers, a particular description of which will be presently given, together with a number of kills, gats, and creeks, some of which resemble small rivers, and are navigable, as Raritan kill, kill Van Kull, Nieuvesink, &c. This bay is also so formed as to render it safe from all boisterous winds, and a thousand ships of burthen may harbour in it within the land. The entrance into the bay is extensive, and is accompanied with but little danger to those who have once gone, or have been taught the passage. If persons are so inclined, and the wind fair, they may in one tide proceed from sea to the city of New Amsterdam, which lies five (Dutch) miles from the ocean, and that when deeply laden, with an easy sail, and by ships of the greatest burthen."—The following is the depth of water over the bar, as furnished by the pilot of the United States' ship Boston, which passed it in June, 1830, with the wind from the westward.

Carried over the bar . . .	25 ft.	6 in.
Tide had fallen	1	6
	27 ft.	0 in.

The whole island of New York constitutes one county, which is governed by the city charter, and divided into fourteen wards, each equally represented in the common council, and each electing its own municipal officers. Members of congress and assembly are elected by the whole people, and whoever has the highest number of votes, is chosen, whether that number constitutes a majority of the whole or not. The common council sits, and the courts are held, in the city hall, a handsome marble building, finely situated in an extensive park. There is, perhaps, no place in the world where the municipal authority exercises such despotic sway over the property of the citizen, in opening, levelling, widening streets, and other alterations and improvements. It is not an uncommon case for property to be assessed, for one or other of these purposes, for more than it is worth; and the only privilege accorded to the owner is that of abandoning it to the corporation, and paying the rest out of his own pocket. Under this system, it cannot, however, be denied, that New York has advanced in beauty and improvements almost beyond example. The population, in 1697, was 4302; in 1756, 13,040; in 1790, 33,031; in 1800, 60,489; in 1810, 96,373; in 1820, 123,706; in 1825, 166,086; and, in 1830, 207,021. In 1769, in a hotly contested election of four days, the number of votes taken was 1515; of the voters 917 were freeholders: in 1830, the number of votes for members of congress was upwards of 21,000; the proportion of freeholders not known, as property is no longer the basis of representation. The revenue of the city, in 1830, was 1,036,930 dollars; the expenditure, 1,033,419; and the debt, 774,455. In the same year, the revenue collected at the custom-house was 21,756,709 dollars; the foreign tonnage entering the port, 450,868 tons; the arrivals from foreign ports, 1510, of which 1366 were American. The number of coasting vessels frequenting the port is almost incalculable. For 1810, the assessment of real and pesonal property was 125,288,518 dollars; in 1688, the value of estates assessed was £78,231. In 1824, the number of deaths was 4341; in 1825, 5018. The proportion of births to deaths is not known as it ought to be, in order to draw any useful practical conclusions from this subject. Of these deaths, one-sixth were from consumptions. The greatest number of deaths, in 1824, was in the month of August, the smallest in December. In 1825, the greatest mortality was in July, and the smallest in April.

The air of New York is keen and cold in winter, partly owing to its being entirely surrounded by water, which freezes more or less during that season. The spring is generally lingering and backward, owing to the great prevalence of chilly easterly winds, coming directly from the sea; but the summer is less oppressive than in Philadelphia and Baltimore, and the autumn, for the most part, very pleasant. During the heats of summer, the Battery and Castle garden afford a never-failing source of coolness, and a prospect equally refreshing and delightful. The nights are almost always rendered comfortable, even in the hottest weather, by the sea breezes, the influence of which is felt very sensibly.

On the whole, the climate is not unfavourable to health or long life, except to persons inclined to consumption. To them it is highly dangerous. The water in the lower part of the city is brackish.

Columbia college is at present the only institution of the kind in New York. It is finely situated, on an open square, ornamented with majestic trees; and the standard of classical education is supposed to be higher than in most of the colleges of the United States. The faculty consists of a president; a professor of moral philosophy, rhetoric, belles-lettres, and political economy; a professor of Greek and Latin; a *Jay* professor of ditto; a professor of natural and experimental philosophy and chemistry; a professor of mathematics, analytical mechanics, and physical astronomy; a professor of law; a professor of the Italian language and literature; and a professor of the French language and literature. The number of students is about 100. There is a grammar school connected with the college. It was founded by royal charter, in 1754, which has been frequently confirmed, with occasional alterations, by the legislature of the state. Columbia college possesses an estate valued at 400,000 dollars. The university of the city of New York is an institution recently established, chartered by the legislature in February, 1831. It is projected on the broad and liberal scale of the universities on the continent of Europe, and promises to be of great advantage to the literature of the United States. Its funds have been raised by the subscriptions of liberal individuals. It is governed by a council of thirty-two members, chosen by the subscribers, together with the mayor and four members of the common council of the city. A large amount of money has been raised for its endowment.

There are numerous schools of all kinds in the city, in which all classes and colours may be accommodated; so that it is not too much to say that the means of obtaining such an education as is essential to the ordinary occupations and pursuits of life, are within the reach of all who will exert themselves to make use of them. There are upwards of 100 churches in the city, of almost every denomination of believers. Of these, some are of a handsome order of architecture, and splendidly ornamented within. The disposition of the people of New York is very liberal towards the endowment and support of religious establishments, Bible and missionary societies, &c. Of all the churches of the United States, Trinity church is the best endowed. It is restricted, by its charter, to an actual revenue of £5000 sterling a year, and has been obliged to alienate a vast property in the city, in order to keep within bounds. But for this, its revenues would probably have amounted to six, perhaps ten times the sum to which it is restricted by charter. The nature of this work does not admit of particularizing the different charitable institutions and societies for the relief of human misery. It is sufficient to say, that there is scarcely a want or infirmity to which our nature is exposed, that has not a resource in some one of these institutions, which are supported either by public munificence or private charity. Neither is New York behind her neighbours in the number of her literary and scientific institutions, although her almost exclusively commercial pursuits might furnish some apology if she were. The most ancient of these, it is believed, is the society library, founded in 1754, and containing upwards of 22,000 volumes; the historical society, incorporated in 1809, and which has collected and preserved a vast number of records, appertaining to the early history of the United States, and the state of New York particularly. The lyceum of natural history has been very successful in the pursuit of its objects, and its collections and publications do it great honour. The Clinton hall association is an incorporation for the promotion of literature, science, and the arts, which has but lately attained to an existence, which, it is hoped, will be prosperous; and the mercantile library association can hardly fail of being eminently useful, if properly conducted. There are two academies of the fine arts in New York—the American and the National—the former supported by amateurs, the latter composed of artists, with a few exceptions. In 1827, the returns made, according to law, to the comptroller of the state, made the total of banking capital in New York amount to 15,960,403 dollars. Since that period, several new banks have been chartered, adding largely to this sum. The number of insurance companies is upwards of forty.

There is no city in the United States, perhaps in the world, which possesses greater advantages of situation than New York, both for internal and external commerce. These advantages have been improved by a vast line of canals connected with the Hudson, and concentrating the produce of an immense region on its bosom, all of which at length finds its way to the great mart of domestic and foreign trade. It is here that merchants and traders resort from all quarters; from the shores of the Atlantic, the confines of the lakes, and the banks of the Mississippi, with a certainty that they can dispose of their own produce, and supply themselves with every article they require. It is here, too, that strangers and travellers congregate, as the place of departure to every part of the world, attracted by the facilities offering themselves at regular stated periods. It may serve to give some idea of these, to state, that there are opportunities by regular packets to Liverpool four times a month; to Havre, three times; to London, twice; to Hull, Greenock, Belfast, Carthagena, Vera Cruz, Charleston, Savannah, New Orleans, Mobile, Washington, Boston, Philadelphia, Baltimore, Norfolk, and, indeed, to almost every place of note in the United States, in lines of vessels, sailing at stated times, which may be relied upon with almost perfect certainty. The advantageous situation of New York naturally inclines the inhabitants to commercial pursuits; but of late years large capitals have been invested in manufactures, which are daily becoming objects of attention. But the probability is, that it will long remain in a great degree a central point for the commerce of the United States.

That part of the coast of America which comprehends the state of New York, was first discovered by Sebastian Cabot, who was employed by Henry the Seventh of England, in 1497. But he made no attempts at landing, or forming settlements, contenting himself with claiming the country for his sovereign, by right of discovery. In 1609, Henry Hudson, an Englishman, acting under a commission from the king of England, entered the bay of New York, and sailed up the river as far as latitude 43° north. The English writers maintain that he was employed by their government, and that he sold the country thus discovered to the Dutch, without authority. The Dutch writers, on the contrary, maintain, that he was in the service of the Dutch East India company at the time. Be this as it may, the English made no opposition, for some time, to the settlement of the country by the Dutch. The right of the English was, however, in some measure recognised, by the Dutch applying for, and receiving permission from James the First in 1620, "to build some cottages on Hudson's river, for the convenience of their vessels engaged in trade with Brazil." Under this license, they settled a colony, to which they gave the name of the *New Netherlands*. Various disputes about boundaries, &c., occurred, for several years afterwards, between the English, the Dutch, and the Swedes; but these are no longer subjects of interest. The first buildings erected in New York were in 1621, near the junction of the East and North rivers, about Whitehall, and Broad street, and Coenties, and Old slips. The first Dutch governor was Wouter van Twiller, in 1629, who was succeeded by William Kieft, whose successor was Petrus Stuyvesant, the last of the Dutch governors. King Charles the First having made complaints of the encroachments of the Dutch on New England, the states-general declared the settlement of New Netherlands "to be only a private undertaking of the West India company of Amsterdam." The 12th of March, 1664, Charles the Second granted to his brother James, duke of York, "all Mattawacks, now Long Island, all Hudson's river, and all the lands from the west side of Connecticut river to the east side of Delaware bay, together with the royalties and rights of government." The duke sold that part of the grant which comprehends New Jersey, and the remainder, which comprehended the present state of New York, was retained by him, and so called in honour of the proprietor. The possession was guaranteed to him by the states-general, by the treaty of Breda, in 1667. Previous to this, however, in 1664, the New Netherlands was taken by the English. In 1673, it was retaken by the Dutch, and in 1674, on the 9th of February, it again fell into the hands of the English, and so remained until the revolution. In 1683, the first colonial legislature was convened in New York. In 1765, a congress of deputies from the colonial assemblies met at the same place to consult about grievances. In 1770, the liberty pole, which had been set up by the citizens, was cut down by the soldiers, and a new one erected, secured with iron. About the same time, the assembly gave great offence by voting 5000 dollars for the supply of the king's troops quartered in the colony. On this occasion, an address was published "To the betrayed inhabitants of the city of New York," signed "A Son of Liberty," which the assembly pronounced a "a false, seditious, and infamous libel." Captain, afterwards general M'Dougall, was brought before the chief justice as the publisher, refused to give bail, was committed to prison, and afterwards admitted to bail. He was ordered before the bar of the assembly at their next meeting, refused to ask pardon, was committed to prison for contempt, and there remained until the assembly was prorogued, in 1771. About the middle of December, 1773, seventeen chests of tea, which had been brought to the city from a tea ship lying at Sandy Hook, were seized by the citizens and thrown into the river. In the year 1775, the assembly of the province met in New York, and renounced all concern in the proceedings of the congress which convened at Philadelphia the preceding year, declining choosing members to the new one. At the same time, they petitioned the king, in their own names, for a redress of grievances; remonstrated in behalf of the people of Massachusetts; and concluded by disavowing all ideas of independence. This course gave great offence to the popular party denominated the *sons of liberty*, who called a meeting, March 6, which eventuated in an appeal to force, in which the tories were put to flight by the sons of liberty, armed with hoop-poles; and the scale from that moment turned in favour of the popular party, under captain Sears, or *king Sears*, as he was familiarly called. On receipt of the news of the affair at Lexington, Sears, in conjunction with captain, afterwards general Lamb, called a meeting, in which it was resolved, that the custom-house should be closed. A committee of 100 persons was appointed to preserve order in the city, and an association entered into to stand by the continental congress. But the citizens were far from being united. There was a strong party among the more wealthy, which only awaited an opportunity to thwart these measures. Captain Sears, who had been ordered, by the convention appointed to direct the affairs of the colony, to remove the cannon from the battery, succeeded in his object, though fired upon by the Asia seventy-four, which lay off in the river. The conduct of the citizens of New York not being quite agreeable to the sons of liberty, captain Sears advised general Washington to send a body of troops to secure the city; but the general could not spare them. General Lee, however, by the assistance of governor Trumbull of Connecticut, collected a body of 1200 militia for the purpose. Being detained at Stamford, he sent a part of these on under the command of captain Sears, and followed soon after. The inhabitants were greatly alarmed at their arrival, the British naval commandant having declared that he would fire the city if any continental troops entered it. To this Lee answered, "that if the men-of-war should set one house on fire in consequence of his coming, he would chain a hundred of their friends together by the neck, and make the house their funeral pile." The 17th of March, the British having evacuated Boston, Washington despatched general Heath, with five regiments, and shortly afterwards followed, with nearly all his army, to New York. After the defeat of the Americans on Long Island, and the masterly retreat of Washington across the East river, he was obliged, by a series of operations on the part of the enemy, to retreat across Haerlem river to the continent. This left the city at the mercy of the British, who accordingly took forcible possession, which they retained until the 25th of November, 1783, when they finally evacuated it. The day has ever since been commemorated by a military procession and public rejoicings. The 4th of December following, Washington took leave of the officers of the army, at Francis's hotel. Calling for a glass of wine, he thus addressed them—"With a heart full of love and gratitude, I now take leave of you, devoutly wishing that your latter days may be as prosperous and happy as your former have been glorious and honourable." The ceremony was in the highest degree affecting, and few of the officers could refrain from tears. In 1789, the first congress, under the new constitution, met at New York, and Washington was sworn into the office of president of the United States, by Chancellor Livingston. From this period, the city, which at the time of its surrender by the British, was estimated to contain little more than 20,000 people, has continued to advance in wealth and numbers, with a pace as steady as it has been rapid.

NEW ZEALAND. See *Zealand, New*.

NEW ZEALAND FLAX. See *Flax, New Zealand*.

NEW ZEALAND SPINAGE (*tetragonia expansa*); a succulent trailing plant, destitute of beauty, inhabiting that country whose name it bears. It has lately been introduced into Europe, and also into America, as a substitute for spinage, over which it has this advantage, that, if watered, it will produce leaves of the greatest succulency throughout the whole summer. A bed of twenty plants is said to be sufficient to give a daily supply for a large table.

NEY, Michel, duke of Elchingen, prince of Moscow, marshal and peer of France, grand-cross of the legion of honour, knight of St Louis, and of several orders in foreign countries, was born in 1769, at Sarre Louis, in the department of the Moselle. He was of humble origin, and, at an early age, entered the military service. From a private hussar, he rose by degrees to the rank of captain, in 1794, when his courage and military skill were observed by general

Kléber, who gave him the command of a corps of 500 men, and, in 1796, appointed him adjutant-general. He soon surpassed the expectations which he had excited, and, in 1796, at the battle of Rednitz, was made general of brigade. Notwithstanding his rank, his impetuous courage often led him to expose his person like a private soldier. He contributed essentially to the victory of Neuwied, in 1797. After a valiant defence, he was taken prisoner at Diernsdorff; and, on his liberation, in 1798, was made general of division. As such, he commanded on the Rhine in 1799, and, by an able diversion at Manheim, contributed to the victory of Massena, at Zurich, over the Russians under general Korsokoff. Ney also distinguished himself under Moreau, particularly at Hohenlinden. In 1802, he was sent ambassador to the Helvetic republic. In 1805, he commanded in the camp at Montreuil, and was appointed by Napoleon marshal of the empire and grand-cross of the legion of honour. He opened the campaign of 1805 against Austria by a brilliant victory at Elchingen (whence he received his title duke of Elchingen), and brought about the capitulation of Ulm. He occupied the Tyrol, and marched on to Carinthia, when he was stopped in his career by the peace of Presburg. In 1806 and 1807, he fought at Jena, and, after the capture of Magdeburg, at Eylau and Friedland. In 1808, he maintained his high reputation in Spain. Napoleon recalled him, but kept him at a distance till the commencement of hostilities against Russia, when he received the chief command of the third division of the imperial forces. At the battle of Moscow, Napoleon gave him the well-deserved title of *le brave des braves* (bravest of the brave). After the burning of Moscow, he led the van of the army, and, by his masterly conduct, prevented its utter destruction. On this occasion, his ability was perhaps more strikingly manifested than at any former period. The emperor made him prince of Moscow, and Alexander confirmed the title on his visit to Paris, in 1814. In the spring of 1813, Ney reorganized the army which had conquered at Lutzen and Bautzen, and marched with it to Berlin; but was met at Dennewitz by Bulow, and defeated. He was now obliged to retire to Torgau, but soon took the field again; chased the Swedes from Dessau, and fought with his wonted valour at Leipsic, where he received a wound, and afterwards at Hanau. When the enemy entered France, he disputed every step of their progress. Brienne, Montmirail, Craonne, and Chalons-sur-Marne are shining names in the history of his battles. When Paris was taken, and the emperor was vacillating, Ney was the first who ventured to suggest to him that the contest would soon assume the character of a civil war, unless it were brought to a speedy termination. Thus he had an important influence upon Napoleon's abdication. After this event, Ney took the oath of allegiance to the king, was made a peer, and received the cross of St Louis and the command of the cuirassiers, dragoons, chasseurs, and light-armed lancers. He enjoyed the most marked distinction at court, and appeared to be entirely devoted to the Bourbons. When Napoleon landed, on his return from Elba, Ney collected a considerable force, was appointed its commander, and, with many assurances of his zeal and fidelity to the king, marched against the invader. But, soon noticing the desertion of his soldiers, and their inclination for Napoleon, he regarded the cause of the Bourbons as lost; and, receiving an invitation from the late emperor, he joined him at Lyons, on the thirteenth of March, and thus opened his way to Paris. In the war of 1815, Napoleon gave him the command of his left wing, which engaged with the British at Quatre-Bras. The charge made by general Gourgaud, from the lips of Napoleon himself, that Ney's conduct in this engagement was the cause of all the disasters of the campaign, has been fully refuted by Gamot, by means of a copy of the written orders which the marshal received on that fatal day. At Waterloo, he led the attack on the enemy's centre, and, after five horses had been killed under him, remained last upon the bloody field. His clothes were full of bullet-holes, and he fought on foot till night, in the midst of the slain. After the defeat, he returned to Paris, where he entered the chamber of peers, and publicly contradicted the assertion of Davoust, the minister of war, that 60,000 men had arrived under the walls of Guise, declaring, in plain terms, that all was lost. On the return of the king, Ney was included in the decree of July 24, 1815. For a considerable time he remained concealed in the castle of a friend at Aurillac, in Upper Auvergne. During an entertainment given by his friend, one of the guests observed a splendid sabre. The account of it reached the ears of the sub-prefect, and it was immediately recognised as the sabre of Ney. The castle was searched, the marshal taken, and imprisoned on the fifth of August. Ney might have escaped with ease, but he was confident of acquittal. He was brought before a court-martial, which declared itself incompetent to take cognizance of his case, on the tenth of November. His trial was therefore referred to the chamber of peers, where the minister, the duke de Richelieu, was eager for his punishment. His advocate was Dupin. The twelfth article of the capitulation of Paris, signed July 3, 1815, promising a general amnesty, was quoted in his favour; but Wellington affirmed that this was not the true construction of the article. Notwithstanding the remonstrances of marshal Davoust, who had made the treaty, and who explained it in favour of Ney, he was sentenced to death on the eighth of December, by 169 votes against seventeen. With the calmness which had distinguished him through the whole trial he listened to the sentence; but when the person who read it came to his title, he interrupted him—"What need of titles now? I am Michel Ney, and soon shall be a handful of dust." When the assistance of a priest was offered him, he replied "I need no priest to teach me how to die; I have learned it in the school of battle." He permitted, however, the curate of St Sulpice to accompany him to the scaffold, and compelled him to enter the carriage first, "You mount before me now, sir, but I shall soonest reach a higher region." On the seventh of December, 1815, at nine o'clock, A. M., he was shot in the garden of Luxemburg. When an attempt was made to blindfold him, he tore away the bandage, and indignantly exclaimed, "Have you forgotten that for twenty-six years I have lived among bullets?" Then, turning to the soldiers, he solemnly declared that he had never been a traitor to his country, and, laying his hand upon his heart, called out, with a steady voice, "Aim true. France forever! Fire!" Marshall Ney left four sons, one of whom has since married the daughter of the famous banker Laffitte.

NIAGARA; a township of Niagara county, New York, on the river of the same name. It embraces Niagara falls and Manchester village. At this village there is a post-office; and it contains a spacious hotel for those who visit the falls.

NIAGARA FALLS are situated on Niagara river, about equidistant between lakes Erie and Ontario. They have already been described in this work, under the article *Cataract*. Whoever notices the structure of the land between the two lakes, must be convinced that the falls have greatly receded from their former position. Lake Erie is 334 feet higher than lake

Ontario. The land does not gradually slope to the northward to make this descent, but stretches in broad plains, and descends by precipices. The last and principal of these abrupt declivities is at Lewiston, eight miles from the cataract; and here must have been the original site of the cataract, although we cannot tell how long ago the river began to cut this vast chasm, nor how long it will require to extend it to lake Erie. The waters of the Niagara are usually frozen over during a part of the winter, except at the falls, and where the rapids are most violent. Then may be seen myriads of wild ducks lighting upon the foaming stream above the falls, and descending on the smooth sheet of the cataract until it reaches its extreme circular verge, at about half its descent; then, taking wing, they wheel round to the same place on the rapids, and again repeat their defiance of the terrors of the cataract.

NIAGARA RIVER, between New York and Upper Canada, runs from lake Erie into lake Ontario, and thus connects the St Lawrence and lake Ontario with the upper lakes. Its length is thirty-six miles; its breadth is from half a mile to seven miles. Several islands are embraced within it. At Black Rock, two miles from lake Erie, the river is three-fourths of a mile wide; and this is its breadth at the falls. It affords a great variety of fish, such as sturgeon, bass, muscanunge, or muscalunga; and salmon-trout are numerous below the falls. The white-fish, weighing from two to five or six pounds, are taken in seines, from October till May. It is a most delicious fish, and is said to be peculiar to this river and the great lakes. From fort Erie, on the Canada shore, at the outlet of lake Erie, to Chippewa (eighteen miles), the bank is from four to ten feet high. From Chippewa to the great fall, two and a half miles along the Canada shore, there is a descent of ninety-two feet, and the bank is from ten to 100 feet high. The river is here so rapid that it is always covered with a white foam. From the cataract to Lewiston is seven miles; and near this place the bank is 310 feet high, composed of strata of soft mud and sand, clay, gypsum, slate, limestone, and a superstratum of earth. From Lewiston to lake Ontario is seven miles, and in this distance the Northern Terrace, or Mountain Ridge, crosses the course of the river. The height of the bank then diminishes to twenty-five or thirty feet. The whole descent of the river, and thus the difference of level between the two lakes, is 334 feet.

NIBELUNGENLIED (i. e., *song of the Nibelungen*), an ancient German epic, little known to English readers, but ranking among the nobler works of imagination. The name *Nibelungenlied* is derived from *Nibelungen*, or *Niflungen*, an ancient and powerful Burgundian tribe, the name of which, in all probability, may also be founded on the ancient mythical ideas of a *Nebelland* (land of mists), in the North. Others derive the name from *Nibullunun* (intrepid); and others still from the *Ghibelines* (q. v.). The subject of this great epic is the dreadful fate of this tribe, caused by the passion of two princely pairs. The one pair is Siegfried, son of king Sigismund of Santen on the Rhine, and Chriemhild, sister to Gunther, king of Burgundy; the other is Gunther and Brunhildis, a heroine of the fabulous North. Siegfried—as noble a hero as ever was depicted—is beloved by Chriemhild. Her brother Gunther is enamoured of Brunhildis of Iceland. But the fair can only be won by force. A successful suitor must conquer her in combat. Gunther promises Siegfried his sister's hand, if he will aid him in gaining Brunhildis. Siegfried conquers the martial maid by means of his magic cap, which makes him invisible, and increases his strength twelve fold, and gives her to Gunther. She afterwards has a struggle with Gunther, in which she overcomes him. Siegfried a second time reduces her to submission, and takes from her her girdle and ring, in which lay her power. These he gives to Chriemhild, who, in a subsequent quarrel with Brunhildis, shows her those trophies of her defeat. Brunhildis resolves on vengeance, and persuades Hagen of Tronege to murder Siegfried, which he effects, with the privity of Gunther. Chriemhild, bent, in her turn, on vengeance, marries the heathen Etzel (Attila, king of the Huns, a mythological personage, who appears in various stories, under several modifications); invites the Burgundians to the court of Etzel; involves them in strife with the Huns, and, after several bloody battles, both parties are destroyed. Gunther and Hagen, the sole survivors, are taken prisoners by Dietrich of Bern, and put to death by Chriemhild. This poem thus becomes most tragical. The closing scene of the tragedy is delineated with unrivalled power by Peter Cornelius (q. v.), in the plate which forms the frontispiece to his engravings illustrative of the Nibelungenlied. The development of character, in the progress of the story, is remarkable. Chriemhild, the lovely mistress of Siegfried, becomes, in the course of the epic, altogether revengeful and implacable. Her thirst for vengeance drives her even to marry a foreigner and heathen, merely to obtain the means of destroying the race of Gunther; and we become somewhat reconciled to Hagen, the murderer of Siegfried, by his inflexible devotion, on all occasions, to the will of his sovereign lady Brunhildis—a devotion which feudal times esteemed so highly. The time in which we find the historical basis of this tragedy is about 430 or 440, A. D.; the scene is on the Rhine, and on the frontiers of Austria and Hungary. The poem of the Nibelungen, after having been long forgotten, appeared again to delight the lovers of true poetry and of German antiquities. It is founded on original *sagas*, variously interwoven with each other, which have come down to us, and of which we find Scandinavian modifications in the *Edda*, the *Wilkinasaga*, and the *Niflungasaga*. It belongs to the same heroic age with the *Heldenbuch* (q. v.). The Nibelungenlied seems to have undergone several remodellings, at different periods. These are generally considered to be four. As the poet who gave it its present shape has not disclosed his name, and as no information exists respecting him, conjectures have been divided as to who he was. From the author's geographical knowledge being most accurate in regard to the south-eastern part of Germany, and from his decided predilection for Hungary, and his dislike towards Bavaria, as well as from his flattery towards the house of Babenburg, A. W. Schlegel is inclined to believe that Klingsohr of Hungary, or Henry of Oftendingen,—both of whom were present at the great poetical contest at the court of the landgrave Hermann, at Wartburg (q. v.), in 1207,—is the author. The metrical form of this poem is the strophe, of four iambic and trochaic lines, in rhymed couplets, and admitting of the chief accent being put in six different places; also with spondaic, anapestic, and dactylic rhythm, and a female cæsura in the middle. That part of the poem entitled the *Lament* (*Die Klage*) is undoubtedly the production of a later age, and is in a different form. Besides several fragments, there have been preserved six manuscripts of the Nibelungenlied, of which that of St Gall is the oldest. Muller was the first who published the whole poem in his collection. Von der Hagen first gave a translation of the Nibelungenlied, and, in 1810, a critical edition of the original, at Berlin. After this, he published, in Breslau (1820), the Song of the Nibelungen for the first Time in the oldest Form, from the Manuscript of St Gall, with a Comparison of the other Manuscripts. The second edition, with a dictionary and notes, was published at Frankfort on the Maine (1824), in two volumes. To the works on this poem belong Gottling's *Ueber das Geschichtliche im Nibelungenliede* (Rudolstadt, 1814), and his *Nibelungen und Gibellinen* (Rudolstadt, 1816); Charles Lachmann, *Ueber die ursprüngliche Gestalt des Gedichts von der Nibelungen Noth* (Berlin, 1816), and the edition of the poem itself by the same. There is also an edition by Hinsberg; an unsuccessful translation, in prose, by Zeune; a metrical translation, carefully following the original, by Busching (1815); and one by Simrock (Berlin, 1827).—See A. W. von Schlegel's opinion, in the *Deutsches Museum* (i. 67); Mone's *Einleitung in das Nibelungen-Lied* (Heidelberg, 1818); Von der Hagen *Die Nibelungen, ihre Bedeutung für die Gegenwart und immer* (Breslau, 1819); his preface to his edition and translation of the Edda Songs (1817—1814), and of the *Wolsungasaga* (1813—1815).—See also Grimm's *Anmerkungen zu den altdänischen Heldenliedern*, and Muller's *Sagabibliothek*.

German critics speak highly of the Nibelungenlied, and prefer it in many respects to the Iliad. The language of the Iliad is, they admit, superior to that of the Nibelungenlied, both as to the idiom itself and the mastership with which the Greek poet wields it, though the German epic has a childlike and venerable simplicity. On the other hand, they argue, that the plan of the latter is vastly superior to that of the former. It is a great plan, from beginning to end, and embraces a whole event; the Iliad but a part of an event; though we do not deny a unity of plan to the Greek poem, whether this was original, or only the work of a later age, which joined together disconnected rhapsodies. The heroes of the Nibelungenlied deserve the name for their characters, as well as their deeds. Characters are developed in this poem as in a drama of Shakspeare, whilst we find little of this in the Iliad, excepting, perhaps, in the case of Achilles. The difference, too, between the chief heroes of the two poems, is striking. Achilles is a grand, but a wilful and violent character, whilst Siegfried is noble in action, pure in soul, and full of love. In both poems, the chief hero appears but for a short time. The Iliad does not bring him prominently forward till late in the action, while the Nibelungenlied soon removes him from the stage; yet, in both poems, the whole action turns upon this individual. The Iliad celebrates friendship, in the instance of its first hero, as one of the highest blessings of mortals; in the other epic, secondary heroes illustrate the beauty of this connexion. In the former, the world of gods is an essential element of the whole poem; in the latter, this element is entirely wanting. The Iliad abounds in descriptions of scenes and actions; the Nibelungenlied describes but little; yet German painters, of the first rank, justly consider this epic as of a plastic character throughout. The rhyme in the German poem would, of itself, prevent so easy a flow of narrative as distinguishes the Homeric epic; yet it never misleads the German poet into affected point or rounded phrase, such as we so often meet in the more modern poems; for instance, in Tasso. The origin of the whole catastrophe, in both poems, is love; but what a difference is there in the love depicted, and the use made of it, in the two poems! The lover in the Iliad appears like a boy, who is very properly scolded for his impetuosity by his relations. The love of Siegfried is of the noblest kind—the love of a hero. In the Iliad, love soon ceases to be the prominent agent; in the Nibelungenlied, it is throughout the source of the action. The Iliad ends early, and does not even carry us to the death of Achilles, which the poem predicts, in so many passages, as near; nay, for which it prepares us in that charming passage in which Patroclus requests his friend to let the ashes of both repose in the same urn. The poet seems to be afraid of becoming too tragical. The Nibelungenlied exterminates a whole tribe, leaving only a few to mourn the tragic end: and what a scene of mourning! how simple and solemn! Both the poems, with the simplicity of early times, describe the approach of all important events, and the reader is never surprised by unexpected turns; but the interest is not lessened by this. Homer appears individually in his poem much more than the poet of the Nibelungen, as, for instance, in his frequent appeals to the muses for assistance, and in the epithets which he gives to each hero, and which recall to the mind of the reader the idea of an observer and narrator. The German poet never appears himself; he neither gives epithets to his heroes, nor implores heavenly assistance. The great tragedy unfolds without visible intervention. The genius of the poet, or poets of the Homeric songs appears mostly in the narration, the conception of the plan being not remarkable, and the characters having little heroic about them, except the mighty force with which they hurl their spears, and requiring continually the direct interference of the gods. Pallas must take the reins, Apollo interpose his shield, &c. It is therefore the story which delights in Homer. In the Nibelungenlied, the greatness of the poet appears more from the plan, and the masterly manner in which the characters are brought out and sustained, and less in the description and narrative. Yet how full of life, how clear every thing happens before you! If we include, in our comparison, the Odyssey, we may say that both the Greek and the German poets make a grave impression. A whole heroic race perishes in the latter; and, after having read it through, you feel, for a moment, inclined to ask, Why did the world continue to roll on? Such a tragic picture of life leaves a different impression from the Greek poet's dark views of human destiny, as shown, for instance, in Ulysses's visit to the departed. How disheartening is the effect of the scenes of pining discontent which he meets there! a life of labour succeeded by an eternity of gloom. Listen to Achilles's confession in the realm of the dead.

NICANDER, a learned Greek physician and poet at the court of Pergamus, about 160 years B. C., was born, according to some accounts, at Colophon. Two of his poems are still extant—*Theriaca*, upon poisonous animals, and the remedies against their bite; and *Alexipharmaca*, upon antidotes in general. Both are important in natural history. The best editions are those of Gorræus (Paris, 1557, 4to), of Salvinus (Florence, 1764), and of J. G. Schneider (Halle, 1792).

NICARAGUA; one of the states of the Guatimalean confederacy (see *Central America*), lying between the Caribbean sea on the east, and the Pacific on the west, the state of Honduras on the north, and that of Costa Rica on the south. The chief place is Leon, about thirteen miles from the Pacific (32,000 inhabitants), situated on a lake of the same name, which communicates with the lake Nicaragua. The population of the state, in 1824, was about 175,000. The soil is fertile in tropical fruits, cocoa, sugar, indigo, cotton, linen, &c. The country is well wooded, and the forests yield valuable dyewoods and gums. Silver mines, and the gold of the rivers, furnish the inhabitants, who are very ingenious in goldsmith's work, with the materials for their trade.

NICARAGUA, Lake; a large fresh water lake in the state of the same name, 120 miles in length by 41 in breadth, of great depth, and navigable for the largest vessels. It enters the Caribbean sea by the river S. Juan, which is sixty-four miles long, and receives the waters of lake Leon, which is ten miles to the north-west, by a navigable river. The Leon is but thirteen miles from the Pacific, and but five from the river Tosta, which enters that ocean. A union of the two oceans by means of these channels is contemplated.

NICARAGUA WOOD, a kind of dyewood, of a bright red colour, brought from the state of Nicaragua, is thought to be a species of the Cæsalpina, and resembles Brazil wood (*Cæsalpina echinata*) in its properties, but yields a smaller amount of colouring matter.

NICE, or NIZZA; principal town of the county of the same name, belonging to the duchy of Piedmont (1378 square miles, 125,000 inhabitants), situated at the foot of mount Montalbano, not far from the entrance of the Poglione into the Mediterranean. The town has a fortified port, and 19,700 inhabitants, who prepare tobacco, silk thread, liqueurs, perfumery, and essences. The buildings and streets of the new town are fine, whilst the old town has dark, crooked, dirty streets, and dark, misshapen houses. The town and the environs, where also the ruins of a Roman amphitheatre are to be seen, are celebrated for a pure, healthy air, and great mildness of climate, even in the middle of winter, which mildness proceeds from the situation of the northern mountains. These are connected with the Alps, and protect the country from storms. For this reason it is resorted to; the air is so clear, that in good weather the mountains of Corsica are visible. The town has a considerable commerce, particularly in raw spun silk, some oil, and flowers, which, in winter, are sent to Paris, and even to London.

NICE (*Nicæa*), formerly a considerable city of Bithynia, in Asia Minor, of which some ruins yet remain. A part of its former site is now occupied by the small village of Isnik. Nice is celebrated for two ecclesiastical councils held there. The first was convoked by Constantine (q. v.) the Great, in 325, chiefly with the purpose of settling the Arian controversies. His personal influence, and the eloquence of Athanasius (q. v.), obtained the condemnation of Arianism by 318 bishops. (See *Arians*.) Among the twenty canons of this council, the most important is the confession, hence called the *Nicene creed*, based on the Apostles' creed, and, with the Athanasian creed, still received by the larger part of the Christian world. (See *Creed*.) The celebration of Easter on the same day throughout Christendom, and some points of church government, &c., were also regulated by the same council. The proposition to enforce the celibacy of the clergy was rejected, and permission was granted to married clergymen to retain their wives. The second council was convened by the empress Irene in 787, and, in opposition to the iconoclasts (q. v.), determined, that although divine honours were not to be paid to images, they were to be honoured by kissing, genuflexions, incense, and burning of lights. The preservation of relics in the churches was also ordained.

NICENE CREED. See *Creed*, and *Nice*.

NICHE (Italian *nicchia*, a shell); a cavity or hollow place in the thickness of a wall, to place a figure or statue in. Niches are made of all segments under a semicircle; they are sometimes also square. Care must be taken to proportion the niches to the figures, and the pedestals of the figures to the niches.

NICHOLAS, St, bishop of Myra, in Lycia, was born at Patara, and raised to a bishopric by Constantine the Great. He was remarkable for his piety and charity. He was also considered the patron of virgins and of seafaring men. The Dominicans adopted him as their tutelar saint, and the Russians hold his memory in great veneration. He died about 392. Gadshill, in the first part of Henry IV., uses the term *St Nicholas's clerks*, as a cant phrase for highwaymen. Warburton remarks upon this expression, that St Nicholas is the patron of scholars, who are thence called *St Nicholas's clerks*, and as *Nicholas*, or *Old Nick*, is a cant name for the devil, Gadshill equivocally calls robbers *clerks of St Nicholas*. See also his note, to the same effect, on a passage in the Two Gentlemen of Verona (act iii. sc. 1). Grey further remarks, that robbers are called *St Nicholas's knights*.

NICHOLS, John, fellow of the antiquarian societies of London, Edinburgh, and Perth, and for nearly half a century editor of the Gentleman's Magazine, was born at Islington, 1744, and, having received a liberal education, he became at an early age an apprentice to Bowyer, the learned printer. He was subsequently admitted into partnership with his master, on whose death he succeeded to the management of one of the first typographical establishments in London. In 1778 he became coadjutor with David Henry, in the publication of the Gentleman's Magazine; and, on the decease of that gentleman, the duties of editor devolved on Mr Nichols. Among his numerous publications may be mentioned, Anecdotes, literary and biographical, of William Bowyer (1778, 8vo), which formed the basis of his Literary Anecdotes of the Eighteenth Century (9 vols. 8vo), Illustrations of the Literature of the Eighteenth Century (6 vols. 8vo), supplementary to the preceding work; and the History and Antiquities of Leicestershire (folio). He died in 1826.

NICHOLSON, William, an ingenious writer on mathematics, natural philosophy, and chemistry, was born in London in 1758, and went to India, when young, in the maritime service. In 1776 he became agent on the continent for Mr Wedgewood, and afterwards settled in the metropolis as a mathematical teacher. He took out patents for various inventions, and published a Journal of Natural Philosophy, Chemistry, and the Arts, which was continued for several years. His works are principally compilations, but executed with judgment. Among them are an Introduction to Natural Philosophy (1782, 2 vols., 8vo), Dictionary of Chemistry, &c. Mr Joyce (died 1816) is said to have been the principal editor of the Encyclopædia published under the name of Nicholson, who is understood to have had but little concern in the work, except as an occasional contributor.

NICKEL; a metal whose distinct character was suspected by Cronstedt in 1751, and fully ascertained by Bergman in 1775. The ore in which it was first found, and from which it is principally obtained at present, is the *Kupfer nickel*, or sulphuret of nickel, mixed also with arsenic, iron, and cobalt. The pure metal and its preparations are obtained from this mineral, or from the artificial arseniuret called *speiss*, a metallurgic production derived from the roasted ores of cobalt. The most convenient method for obtaining the metal is that in which the speiss is employed, and was suggested by doctor Wollaston. Sulphuric acid is added to the pulverized speiss, and nitric acid, also, at intervals, in the proportion of about one-fourth part; a green solution is formed, and after a subsidence of several hours, the green, supernatant liquid is decanted and evaporated until crystals of sulphate of nickel are deposited: a further evaporation gives a crust of arseniate and sulphate, which is dissolved in water, and agitated by a current of sulphureted hydrogen until precipitation ceases. The fluid is filtered again, and more of the apple-green matter obtained by evaporation, which, when redissolved, becomes opaque, owing to the precipitation of arsenious acid. The fluid is again filtered, evaporated, and suffered to crystallize, when the sulphate of nickel may be relied upon as being entirely pure. This sulphate, being again dissolved, is decomposed by carbonate of soda, and the resulting carbonate, made into balls with oil, and surrounded with charcoal in a crucible, and being heated in a melting furnace for two hours, yields a pure button of nickel. Its colour, in this condition, is between that of silver and tin; and when polished, its lustre is equal to that of platinum. It is malleable, and can be forged into bars when hot, and hammered into plates when cold; specific gravity, when cast, is 8·402, and when forged, 8·66. It is capable of being drawn into very fine wire. It is less fusible than iron. In a covered crucible, some of it is volatilized, and appears in drops on the cover of the crucible. It is attractable by the magnet nearly in the same degree as iron, and becomes itself a magnet by touching, hammering, &c. As nickel does not rust, it has a very great superiority over steel in the construction of a compass. There are two oxides of nickel—the dark ash-gray and the black. If potash be added to the solution of the nitrate or sulphate, and the precipitate dried, we obtain the *protoxide*. It may be regarded as a compound of about 100 metal with 28 oxygen. The *peroxide* was formed by Thénard, by passing chlorine through the protoxide diffused in water: a black insoluble peroxide remains at the bottom. Its colour is a brilliant black. When heated it loses oxygen, and becomes protoxide. *Sulphuret of nickel*, prepared directly from its elements, is of a yellow colour, like iron pyrites, and brittle. It consists of seventy nickel and thirty sulphur. *Chloride of nickel* is prepared by evaporating the muriate to dryness. It is of a yellow green colour, and is a proto-chloride. When calcined in a retort, one portion, of an olive-green colour, remains in the bottom of the vessel, while another sublimes, and crystallizes in small, light, brilliant plates of a gold-yellow colour; these are the *deutochloride*. An *iodide of nickel* may be obtained by heating iodine and nickel in a tube. It is a brown substance; fusible; soluble in water, to which it imparts a light-green colour. The *salts of nickel* possess the following general properties:—They have usually a green colour, and yield a white precipitate with ferroprussiate of potash. Ammonia dissolves the oxide of nickel. Sulphureted hydrogen and infusion of galls occasion no precipitate. The hydrosulphuret of potash throws down a black precipitate. Their composition has been very imperfectly ascertained. The sulphuric and muriatic acids have little action upon nickel. Sulphate of nickel crystallizes very readily. Its primary form is a right square prism. The nitric and nitro-muriatic acids are the most appropriate solvents of nickel. The nitric solution is of a pure green colour. Carbonate of potash throws down from it a pale apple-green precipitate, which, when well washed and dried, is very light. When ammonia is added in excess to a nitric solution of nickel, a blue precipitate is formed, which changes to a purple-red in a few hours, and is converted to an apple-green by an acid. The *alloys* of nickel with other metals are unimportant. With gold, in the ratio of twenty grains to one ounce, nickel, a brass-coloured brittle compound is formed. With iron it unites in every proportion. If nickel prevails, the metal is white, and the ductility and magnetism are equal to that of iron. It does not amalgamate with mercury. Pure nickel being dear and rare, it is entirely unknown in common life, and almost so in the arts. It would undoubtedly be applied to useful purposes if it could be found in sufficient quantity. The *ores* of nickel are not numerous. They consist of *native nickel*, *arsenical nickel*, and *nickel ochre*. Native nickel is found in delicate capillary crystals, of a metallic lustre and brass-yellow colour. According to Arfredson, it consists of 64·35 nickel and 34·26 sulphur. Before the blow-pipe, it melts into a brittle metalllic globule, colours glass of borax violet-blue, and is dissolved in nitric acid without leaving a residue. It occurs at Johanngeorgenstadt in Saxony, Joachimsthal in Bohemia, and in the Westerwald. It has sometimes been called *capillary pyrites*. *Arsenical nickel*, or *kupfer nickel*, occurs reticulated, dendritic and botryoidal, but more commonly massive. Cleavage unknown, imperfect; fracture small conchoidal, uneven; surface smooth; lustre metallic; colour copper-red; streak pale, brownish-black; brittle; hardness above that of fluor; specific gravity 7·65. It consists of nickel 44·20; arsenic 54·72, with small proportions of iron, lead, cobalt, and sulphur. Before the blow-pipe, it melts upon charcoal, and emits an arsenical smell. It chiefly occurs in veins, often accompanied by ores of silver and lead. In undergoing natural decomposition, it is sometimes covered by an apple-green, friable substance, which is called the *nickel ochre*, and which consists of 37·35 oxide of nickel and a little cobalt, of 36·97 arsenic acid, and 24·32 of water. Arsenical nickel is found in veins, at Schneeberg, Freiberg, and several other places in Saxony; also in Bohemia, Thuringia, Hessia, Dauphiny, Cornwall. It has been met with also in the United States, at one locality, Chatham, Connecticut, associated with arsenical cobalt. Mr Dobereiner has observed that the metallic alloy, consisting chiefly of arsenic and nickel, which is obtained from the process of fabricating smalt, often crystallizes in four-sided tabular crystals, and is in every respect similar to arsenical nickel.

NICKOJACK CAVE. See *Cave*.

NICK, Old; the devil. Butler sportively derives this term from Nicholas Machiavelli;

> Nick Machiavel had ne'er a trick
> (Though he gave name to our *Old Nick*)
> But was below the least of these.
> *Hudibras*, p. iii. c. 1. l. 1314.

But it was in use among the English writers before the time of Nick Machiavel, and is derived from our Saxon ancestors, who called the devil *Old Nick*, or, probably, from the northern sea-god, or evil spirit of the waters (*Nicken*).

NICOBAR ISLANDS; a group of nineteen islands in the bay of Bengal, between 6° 45′ and 9° 15′ N. lat., and 93° and 95° E. lon. They yield cocoas, plantains, teak, sassafras, pine-apples. The thick forests and heavy dews render the climate unhealthy for foreigners. The Danes formed a settlement here in 1756, but were obliged to abandon it, on account of the mortality among the colonists.

NICODEMUS; one of the leaders of the Pharisees, who is represented in the gospel as a ruler of the Jews. He went to Jesus by night to receive the instructions of a teacher whom he believed to come from God, and afterwards defended him openly before the Pharisees, and assisted Joseph of Arimathea in paying the last honours to their divine Master. Nicodemus was afterwards deprived of his dignities, driven from the synagogue, and banished from Jerusalem by the Jews. A spurious gospel, called the *Acts*, is ascribed to him.

NICOLAI, Christopher Frederic; a German author and bookseller of some note in the history of German literature, as the founder of the *Allgemeine Deutsche Bibliothek*, which contributed essentially to promote a critical spirit in Germany. Nicolai was born in 1733, in Berlin. His father, a bookseller, educated him strictly. In 1749, he was sent to Frankfort on the Oder, in order to learn the book trade, and, by the greatest industry and economy, was enabled to study several sciences and languages in the then existing university of Frankfort. In 1752, he returned to Berlin, and wrote his Letters on the Present State of Belles-Lettres, in 1756. He soon united with Lessing and Mendelssohn, and the three pursued their labours for the advancement of literature, without submitting to the existing rules of taste. In 1759, supported by other literati, they began their Letters on the most recent German Literature (24 vols., Berlin, 1759 to 1765). In 1765, Nicolai executed his plan of the General German Library—a critical work, which was continued forty years, and had an important influence upon German literature. Nicolai ceased to edit it at the end of the 107th volume, in 1792. The severity of this work, in which the criticisms were written in a cold, prosaic tone, involved him in many disputes; among others, with Wieland, Fichte, Herder, and Lavater. After 1770, he devoted himself to the study of the finances and commerce of Prussia. He published Anecdotes of Frederic the Great and the Persons around him, in six numbers, from 1788 to 1792, which have historical value. His Topographical and Historical Account of Berlin (third edition, Berlin, 1786, 3 vols.) is an excellent work. His novels have little merit, yet his Life and Opinions of Sebaldus Nothanker (fourth edition, 1799), with engravings by Chodowiecki, was translated into French, Danish, Dutch, and Swedish. His journey through Switzerland and Germany—a work containing much statistical information, and written in a bold tone—amounted, in 1796, to twelve volumes. Fichte attacked him in his Frederic Nicolai's Life and strange Opinions, edited by A. W. Schlegel (Tubingen, 1801). Nicolai often misunderstood the direction of the public mind in Germany; and this was the case when that bright star appeared on the horizon of German literature—Goethe. He also attacked Kant's philosophy. In 1791, some causes which violently agitated his mind produced such an effect on his nerves, that for several weeks he appeared to himself continually surrounded with beings, whom he distinctly knew, however, to be mere creations of his imagination. He died in 1811. He wrote many eulogies, and other works not enumerated here, on Freemasonry, the Templars, &c. Gockingk wrote his Life, published in 1820.

NICOLAITANS, according to the general and literal explanation of the passage in the Apocalypse (chap. v. 6), where they are mentioned, and according to the statements of the fathers Irenæus and Clement of Alexandria, were heretics, who extended, in the first century, over Asia Minor and Syria. Nicholas of Antioch, mentioned in the Acts of the Apostles as one of the seven deacons at Jerusalem, is said to have given rise to this sect, by the perversion of his advice to abuse the flesh; i. e., to suppress sensual feelings, which was interpreted by some in a sense directly contrary to his intention. These indulged in pagan sacrifices and the pleasures of sense. This sect, if it really existed, which is doubted by several, soon perished. The Gnostics (q. v.) may have received among them the remains of the sect. The same name was given to the followers of the Anabaptist Nicolai.

NICOLAUS PISANUS, of the city of Pisa; the first true restorer of sculpture and the fine arts in Italy, in the thirteenth century. His principal work, in Bologna, is the Arca di S. Domenico, with fine reliefs. He also ornamented the basilica of St John, erected in Pisa, in 1153, with fine sculpture. He died in 1275. The first period of the history of revived sculpture is dated from his time to that of Donatello. His son John was also an able sculptor (*magister lapidum*). Works of merit executed by him are to be seen in the mausoleum of Benedict XI., and at the altar of the cathedral at Arezzo.

NICOLO, properly NICOLO ISOUARD, one of the most favourite theatrical composers of France, was born at Malta, 1777. His father, who was chamberlain to the grand master, paid great attention to the education of his children, and had several of them brought up in France. Constant de Campion, commander of the order of Malta, placed young Isouard at a school in Paris, where his father intended that he should prepare himself for the navy. His leisure was devoted to the pianoforte. He had already entered the navy as a midshipman, when the commencement of the revolution induced him to return to Malta (1790). Although his father now destined him for the commercial career, he still continued to study music with great success, and even became acquainted with counterpoint. From Malta he went to Palermo, where he spent some years as clerk in a counting-house, and employed his leisure hours in the study of music. He went afterwards to Naples, where he completed his study of the art of composition. The famous Guglielmi instructed him in dramatical composition. He now determined, against the wish of his parents, to devote himself entirely to his favourite art, and wrote his first opera at Florence—*L'Avviso ai Maritati*—the favourable reception of which confirmed him in his determination. However, out of regard to his parents, he published his works under the name of *Nicolò* only, not adding his surname until some time afterwards, in Paris. He next composed the serious opera of *Artaserse*, at Leghorn. The grand master of the order of Malta appointed him organist of the church of the order, after the death of the famous Vincenzo Alfosso, and chapel-master of the order, which situation he held, until, on the arrival of the French in Malta, the order was abolished. He still remained at Malta, where he wrote some small French operas, which were translated into Italian—*Il Tonneliere; L'Improvvisata in Compagna; Il Barbiere di Seviglia.* When the French evacuated Italy, general Vaubois took him to Paris as his private secretary. Here he formed himself on the compositions of Monsigny and Grétry, and connected himself with the dramatic writer Etienne. Both wrote with ease and rapidity. Of all Nicolo's compositions, none was more popular than the opera of *Cendrillon*, which was first produced at Paris, in 1810, and repeated in succession a hundred evenings—a result which is unparalleled in the annals of the *théâtre de l'opéra comique.* This was followed by *Joconde;* and these two operas brought him in 160,000 francs. Amongst his other compositions are *Un Jour à Paris, La Ruse Inutile, L'Intrigue aux Fenêtres, Les Rendez-vous bourgeois,* and the pretty opera of *Jeannot et Colin.* In this light dramatical composition, Isouard is distinguished for the ease and sweetness of his melodies, the fertility of his imagination, and the happy combination of the modern Italian school with the French. He died at Paris, 1818, leaving his opera *Aladin, ou la Lampe Merveilleuse,* unfinished.

NICOMEDES; the name of four kings of Bithynia, the third of whom was engaged with the Romans in the war with Mithridates the Great, king of Pontus. He was intimate with Julius Cæsar when young, which drew upon the latter much censure.

NICOMEDIA; the chief city of Bithynia, named after its founder, Nicomedes the First.

NICOPOLIS (*city of victory*); the name of many ancient cities; of two in Egypt, and two others in

Mœsia and Dacia. One of the most celebrated is that in Epirus, built by Augustus, in commemoration of his victory over Anthony, at Actium, which made him master of the Roman empire. Ruins of this city are still to be seen near Prevesa.

Nicopolis, in Bulgaria, the chief place of a Turkish *sangiacat*, 164 miles west of Adrianople, 276 northwest of Constantinople, with 10,000 inhabitants, was built by Trajan. It lies on the right bank of the Danube, and is a place of considerable strength. Bajazet, the Turkish emperor, gained a victory here over Sigismund, king of Hungary, in 1396. Lat. 43° 45′ N.; lon. 24° 8′ E.

NICOT, JOHN; born in 1530, appointed, by Francis II., French ambassador at the court of Portugal, where he was presented with some seeds of the tobacco plant, which he introduced into France. The botanical term for tobacco (*nicotiana*) is derived from his name.

NICOTINE; a peculiar principle obtained from tobacco. The following process is adopted for obtaining it in a state of purity. Boil twelve pounds of dry tobacco leaves in water acidulated with sulphuric acid; evaporate and treat the extract with alcohol diluted with a ninth part of water; add a little water to the solution, and distil; add hydrate of lime to the aqueous residuum, and redistil. The product being mixed and agitated with ether, the latter is to be poured off, and a fresh portion added. All the ethereous solutions are to be united, and put in contact with muriate of lime, which will take away the water; and the concentrated ethereous solution, being evaporated or distilled, will leave 100 grains of reddish nicotine. It is liquid at 21° Fahrenheit; its odour resembles that of dry tobacco; its taste is very acrid, burning, and durable. It is denser than water, volatilizes in the air, and boils at 417° Fahrenheit. It dissolves in water in all proportions, and the solution has an alkaline reaction. When dissolved in alcohol or ether, and exposed to heat, it does not distil with their vapours. Acids take the nicotine from the ethereous solution, and form salts insoluble in ether. It is eminently poisonous.

NICTITATING MEMBRANE, in comparative anatomy; a thin membrane, chiefly found in the bird and fish kinds, which covers the eyes of these animals, sheltering them from the dust, or from too much light, yet is so thin and pellucid, that they can see pretty well through it

NIEBELUNGENLIED. See *Nibelungenlied*.

NIEBUHR CARSTENS, born at Lüdengworth, in the province of Hadeln (Hanover), in 1733, was the son of a peasant, and his youth was passed in the usual manner of a person of his condition in life. A lawsuit having arisen in his native province concerning the superficial area of a farm, no surveyor was to be found in Hadeln, and Niebuhr immediately resolved to apply himself to the art. At the age of twenty-two, he went to Hamburg, for the purpose of studying geometry, and the most indefatigable exertion was hardly sufficient to enable him to follow the lessons of the gymnasium. He then devoted several years to the study of the mathematics at Gottingen. Count Bernstorff, Danish minister, having determined to send a scientific expedition to Arabia, Kastner, professor at Gottingen, recommended Niebuhr as a member of it. A year and a half of preparation were allowed him, and, in 1760, he received the place of lieutenant of engineers in the Danish service. Niebuhr was geographer to the expedition, which sailed in March, 1761, and, after touching at Constantinople, proceeded to Egypt. Here they remained a year, and reached Yemen, their point of destination, in 1762. Both in Egypt and on the journey, Niebuhr made many important astronomical, geographical, and geodesical observations. Within a year, all his companions died (Von Hagen and Forskal in Arabia, Bauernfeind on the passage to India, and Cramer in Bombay), and Niebuhr himself was saved only by his extreme abstemiousness. The whole object of the expedition would have been frustrated, had not Niebuhr, with extraordinary firmness, continued his journey, and taken upon himself the whole duty of the company. In September, 1763, he sailed for Bombay, where he spent fourteen months in arranging his journal, and, in December, 1764, set out on his return over land, through Persia and Turkey. He arrived in Copenhagen in November, 1767, and laid the fruits of his researches before the world in his Description of Arabia (Copenhagen, 1772), and his Travels in Arabia (2 vols., 1774—1778), both of which were published in Danish, and have been translated into English and other languages. He also edited, from Forskal's papers, the ***Descriptiones Animalium***, &c. (1775), and the ***Flora Ægyptiaco-Arabica*** (1776). Great accuracy of observation, and strict veracity give to his accounts a high value, and render them the most trustworthy source of information concerning the countries visited by him. In 1768, he was made captain of engineers; in 1778, secretary of the district of South Ditmarsh, and, in 1809 knight of the order of the Danebrog. In 1802, he was chosen foreign member of the French national institute. He died in 1815.—Niebuhr was remarkably frugal; his moral character was spotless; his manners pure and severe; and he ever appeared disinterested and modest. Nobility, which was offered him, he declined. His celebrated son wrote his life, the substance of which forms the forty-eighth number of the Library of Useful Knowledge.

NIEBUHR, BERTHOLD GEORGE, the celebrated historian of Rome, was the son of the preceding. He was born in Copenhagen, Aug. 27, 1776; but, before he had reached his second year, his father (a German) received an appointment in Germany, in South Ditmarsh, whither he took his son. An account of his early education is given in his biography of his father. Intercourse with several distinguished scholars, particularly J. H. Voss, the celebrated translator of Homer, early inspired him with a peculiar love for the classics. His father was intimately acquainted with the famous Büsch, which was the cause of Niebuhr's residence for some time in Hamburg, where he acquainted himself with commercial affairs. Here, also, he was in constant intercourse with Klopstock, who had a great friendship for the youth. From 1793 to 1794, he studied law in the university of Kiel; but his inclination for the classics continued. When nineteen years old, he went to the university of Edinburgh, in order to study the natural sciences under the professors of that institution, then so famous. He remained one year and a half in Edinburgh, and then travelled over England for six months, and obtained an extensive knowledge of the institutions of the country, assisted as he was by a memory of whose power the writer of this article,[*] in a long residence with Mr Niebuhr, has seen most surprising proofs. When he returned from England, he was appointed private secretary to the Danish minister of finance, in which situation he had an opportunity to examine closely the administration of count

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[*] FRANCIS LIEBER, the editor of the American edition of the 'Conversations Lexicon, who, when reduced to great distress, on his return from Greece, whither he had gone to support the Greek revolutionary cause, was, though a stranger, generously taken under Niebuhr's roof, at Rome, and treated, during a long residence there, with undeviating kindness. Mr Lieber has recently published a volume containing Reminiscences of Niebuhr, to which the character of the historian and the gratitude of his biographer are both pleasingly and creditably displayed.

A. P. Bernstorff, which, as he himself says, in the biography of his father above-mentioned, affected essentially the direction of his whole life. After a certain time, he was appointed a director of the bank. In 1801, he witnessed the bombardment of Copenhagen. The invasion of Germany (which he always loved as his true country) by the French affected him much; and his translation of the first Philippic of Demosthenes, dedicated to the emperor Alexander, with a remarkable call upon him, prove his sentiments. In 1806, he was taken into the Prussian service; but, soon after his arrival in Berlin, the battle of Jena changed the whole condition of the kingdom. In Konigsberg, whither he had followed the court, he was appointed one of the counsellors who directed public affairs, under Hardenberg, until the peace of Tilsit. He then took an active part in the organization of the Prussian states under the minister Stein. In 1808, he was sent to Holland on a special mission, where he remained fourteen months, during which he always contrived to save some time from his public occupations for study. On his return to Berlin, he was made privy-counsellor of state, and a temporary officer in the department of finances. In 1810, when the university of Berlin was established, his friends persuaded him to deliver his first lectures on Roman history; which were received with such interest by the hearers, and so much commended by men like Buttmann, Heindorf, Spalding, and Savigny, that he published, in 1811 and 1812, the two volumes of his Roman history. When the Prussians rose against the French, he established a journal at Berlin, under the title of the Prussian Correspondent, and, in 1814, was sent again to Holland, to negotiate a loan with Britain. On his return, in the same year, to Berlin, he lost his wife, and, soon after, his father; and, to divert his mind under his losses, he planned the biography of his father, and edited, together with Buttman and Heindorf, the fragments of Fronto, found in Verona by Angelo Maio. In 1816, he married a second time, and was appointed Prussian minister at the papal see; and on his passage through Verona to Rome, he discovered, in the cathedral library of the former city, the Institutions of Gaius. (See *Caius*.) The chief object of his mission was to arrange with the pope the reorganization of the Catholic church in the Prussian dominions, which was finally settled by the Prussian concordate, when prince Hardenberg went to Rome in 1822. The result is the bull *De Salute Animarum*. Pius VII., himself a lover of science, had a great regard for Niebuhr. Even before he went to Italy, his attention had been directed to the importance of the *Codices rescripti* (see *Codex*), and the discovery of Gaius added to his interest in the subject, so that he spent much time in Rome, in an accurate examination of the manuscripts of the Vatican library; but, when Angelo Maio was appointed keeper of the library, a very ill-placed jealousy on his part towards Niebuhr prevented the latter from continuing freely his learned labours, the result of which he made known to the world in his collection of unedited fragments of Cicero and Livy (Rome, 1820); and, at a later period, when a good understanding existed again between Maio and Niebuhr, produced by the disinterested frankness of the latter, he took an active part in Maio's edition of the precious fragments of Cicero's *De Republica*. His residence in Rome gave him an intimate knowledge of the localities of the city, and a clearer conception of its ancient character and history. His knowledge in this branch appears in his essay On the Increase and Decline of Ancient, and the Restoration of Modern, Rome, which is printed in the first volume of the Description of Rome, by Bunsen and Plattner. It is also published in his Minor Works. In this period he also wrote some Latin treatises in the *Atti dell' Accademia di Archeologia*, on the Greek inscriptions brought by Gau from Nubia, and a German treatise on the age of Curtius and Petronius, in the Transactions of the Academy of Berlin. In 1823 he left Rome, and, before his return to Germany, went to Naples, where he devoted some hours every day to the collation of the best manuscript of the grammarian Charisius in the library of that city. In Switzerland, he remained six weeks in St Gall, examining laboriously the manuscripts of the library; and, if he expected more than he actually found, he at least discovered some remains of the latest Roman poetry, that is, poems of Merobaudes. He settled in Bonn, where the Prussian government had established a university. He wrote here, in the winter of 1823—1824, that portion which is finished of the third volume of his history of Rome. He was appointed a member of the council of state, whose sessions he attended at Berlin. After his return to Bonn, he determined to remodel the two first volumes of his Roman history before publishing the third, as further researches had changed his views in many respects. He now also began to lecture again, and the fees paid for attendance he devoted to prizes for scientific questions, or to the support of poor students. Volume i. (2d ed.) appeared in 1827, and was so well received that the third edition appeared in 1828. The second volume was, in its new state, finished only a few months before his death; and, in the preface, he says that the melancholy influence of recent political events upon his mind appears in the mode of the execution of the concluding part of the work. That part of the third volume which he had finished, and which carries the history of Rome from the Licinian law to the last quarter of the fifth century, will probably soon appear. Niebuhr's activity was great. Every scholar will easily perceive in his history the extensive and unremitted labour which it required; and, towards the close of his life, he added to his other occupations the task of preparing a new edition of the Byzantine Historians. He himself made the beginning with a critical edition of Agathias, and obtained active collaborators, while he superintended the execution of his plan. At the same time, he made a collection of his treatises in the Transactions of the Academy of Berlin, and in the Rhenish Museum, which he had edited, together with professor Brandes, since 1827. His reputation is spread over Europe, and in America he is equally honoured. He died, January 2, 1831, at a period of his life which afforded reason for expecting much from him. His wife died on the 11th of the same month. The task of confining articles within the limits required by a work like the present, often difficult, is, on the present occasion, painful, from the necessity of repressing the utterance of gratitude for numerous benefits, and of admiration for a man whose integrity, benevolence, and frankness of spirit, are deeply impressed on the mind of the writer, from a long residence under his roof.

NIEDER (German for *lower*) forms part of many geographical names.

NIEDERRHEIN. See *Rhine, Lower*.

NIELLO (*Italian*); a species of work used among the Romans and modern Italians, somewhat resembling Damascus work, and performed by enchasing a mixture of silver and lead into cavities and holes cut in all sorts of hard wood and metals. This art was denominated by the ancients *nigellum*, and was used by them to decorate a great variety of things, and more especially *candelabra*. It was practised by the jewellers and goldsmiths and flourished chiefly in the fifteenth century. See Duchene's *Essai sur les Nielles*, Paris, 1826, with plates.

NIEMEN (in German, *Memel*); a large river of Lithuania, which rises in the Russian province of Grodno, near Slonim, and divides, eight miles below Tilsit, into two branches, called the *Russ* and the *New Gilge*, which form the Tilsit plain, celebrated for its fertility, and empty into the Curische-Haff. The Tilsit plain suffered severely from an inundation in 1829, by which the river dikes were much injured. The Niemen is navigable in summer, and facilitates the commerce of Memel and Konigsberg. The meeting of Napoleon with the emperor Alexander and Frederic William, king of Prussia, which took place on a raft in this river, in 1807, gives it an historical celebrity.

NIEMEYER, Augustus Hermann, a German theologian and miscellaneous writer, was born Sept. 1, 1754, at Halle, where he studied theology. In 1780, he was appointed *professor extraordinarius* of theology in the university of his native city; in 1784, *professor ordinarius*, and inspector of the royal *pædagogium*. He received a number of appointments, which gradually enlarged the sphere of his activity; and, in 1808, he was made member of the estates of the kingdom of Westphalia, chancellor, and *rector perpetuus* of the university. In 1813 the university was abolished by Napoleon; but, when the Prussian government restored it he was reappointed. He soon laid down this office, but occupied several other places connected with education. Besides a number of sermons, treatises, and translations, he has published the following works, all in German: Characteristics of the Bible; Philotas, or Consolations for the Suffering and the Friends of the Suffering; Timotheus, for the Awakening and Promotion of Piety in thinking Christians; Popular and Practical Theology; Letters to Christian Teachers of Religion; Teacher's Manual (Halle, 1802); Views of German School Instruction, and its History in the eighteenth Century (Halle, 1801); Principles of Education and Instruction for Parents, Tutors, and Teachers (7th ed., 1819, 3 vols.); Original Passages of Greek and Roman Classics on the Theory of Education (Halle and Berlin, 1813); the Book of Religion, and Hymns for higher Schools; Leisure Hours during the War; Religious Poems (Halle and Berlin, 1814.) In 1820, he made a journey to England, which he has described in his Observations in Travelling (1822, 2 vols.) The third and fourth volumes describe a former journey to Holland and France. April 18, 1827, the university of Halle celebrated the fiftieth anniversary of his reception of the degree of master of arts; and the king, on that day, presented the university with 40,000 Prussian dollars for the erection of a building, for which Niemeyer had petitioned. He died at Halle in 1828.

NIERENSTEINER, or NIERSTEINER; a Rhenish wine, which grows near Nierenstein, a village on the left bank of the Rhine, in the grand-duchy of Darmstadt, three leagues S. S. E. of Mayence. It has 2080 inhabitants. See *Rhenish Wines*.

NIEVRE. See *Department*.

NIFLHEIM. See *Northern Mythology*.

NIGER; a large river of the central part of Africa, which has been rendered celebrated on account of our ignorance of its course and termination, and the various theories which have been formed relative to them. Notwithstanding the opinion of some writers, that the Niger of the moderns was known to Ptolemy, and even to Herodotus, it appears evident that nothing was known, by the ancients, of the central region of Africa, and that the streams referred to by those authors were in the more northern parts of that continent. Mungo Park (q. v.) reached the banks of the Niger, at Sego, in the kingdom of Bambarra (July 22, 1796), and determined the direction of its course to be eastward, and not to the west, as had been commonly supposed. He traced its course upward to Bammakoo, and downward to Silla. On his second expedition (1805), he embarked at Sansanding, with the intention of descending the river to its mouth; but, on reaching Boussa, was attacked by the natives, and killed. It was thus ascertained that the Niger rises in the western part of Africa (10°—12° N. lat.), near the sources of the Senegal, and, after an easterly course of several hundred miles, runs in a southerly direction. Different opinions were entertained in regard to its termination. Some supposed it to flow into the Nile; others, into a great central lake: some maintained that it was lost in the sands; and others, that it emptied into the gulf of Guinea, or that the Congo, farther to the south, was its mouth. Numerous attempts were made, by the British government, to resolve the question, but with little success, until the expedition of 1821, under Denham and Clapperton (q. v.). They discovered lake Tchad (lon. 13° E.) and, on visiting Soccatoo (6° 10′ E.), found that the Niger there flowed to the south, under the name of the Quorra. Its termination, however, was yet undetermined. In 1825, Clapperton again set out on a tour of discovery, and crossed the Niger at Boussa. On this expedition, he was accompanied by his servant, Richard Lander (q. v.), who, after the death of his master, attempted to descend the Niger from Fundah, but was prevented by the jealousy of the government. In 1830, Richard Lander set out from Badagry, with his brother John, for the purpose of following down the course of the river to its mouth. They reached the river at Boussa, from thence ascended to Youri and the Cubbie, which comes from Soccatoo. They then descended the river, which flows nearly south from Boussa, and which, after receiving the Shary, expands into a large lake, and thence empties, by several arms, into the Bight of Benin. The mouth by which they reached the sea, is laid down on the maps as the river Nun. Thus from Park's first point, in 1805, its course is traced for 2000 miles, a considerable part of which is navigable for steamboats, through a rich and populous country, the inhabitants of which have made considerable progress in civilization. The river, in the upper part of its course, is known to the natives as the Joliba; in the lower, as the Quorra; the name *Niger* was erroneously applied to it by the Europeans, on the supposition that it was the river spoken of by Ptolemy.

NIGHT. (For the division of the twenty-four hours into day and night, see *Day*.) As a telluric phenomenon, night is of the greatest interest. The sleep which it brings to most organic creatures; the life to which others awake with it; the increase of feverish symptoms on its arrival; and many other phenomena, are of the highest interest.[*]

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[*] One of the most interesting of these is the greater clearness with which distant sounds are heard during night. This fact, which had been observed by the ancients, and in large cities, or their vicinity, was commonly ascribed to the repose of animated beings. When Humboldt first heard the noise of the great cataracts of the Orinoco, in the plain which surrounds the Mission of the Apures, his attention was particularly directed to this curious fact, and he was of opinion that the noise was three times louder at night than during the day. As the humming of insects was much greater at night than during the day, and as the breeze which might have agitated the leaves of the trees never rose till after sunset, this eminent traveller was compelled to seek for another cause of the phenomenon. In a hot day, when warm currents of air ascend from the heated ground, and mix with the cold air above, of a different density, the transparency of the air is so much affected, that every object seen through it appears to be in motion, just as when we look at any object over a fire or the flame of a candle. The air is, therefore, during the day, a mixed medium, in which the sounds are reflected and scat-

In mythology, Night (Latin, *nox*; Greek, *νὺξ*) is daughter of Chaos, and sister to Erebus, by whom she became the mother of Day and Ether. Every thing unknown, dark, horrid, and awful, belongs to her progeny,—Death, Sleep, Dreams, Sickness, and Plague, Discord, War, Murder, Deceit, &c. The Hesperides, also, were called her daughters. According to the Orphic poems, she was also the goddess of love. Modern mythology represents her as mounted on a chariot, and covered with a veil bespangled with stars. Occasionally two children are depicted as held under her arms; the one black, representing the principle of death; the other white, to indicate the innocence and refreshing nature of sleep. Some of the modern artists have depicted her as a woman veiled in mourning habiliments, crowned with poppies, and borne on a chariot drawn by bats and owls. One of the finest representations of Night is a bass-relief of Thorwaldsen: a corresponding piece represents Day. It is one of the loveliest and happiest productions of that great artist.

NIGHT-BLINDNESS; a disease in which the eyes require the full light of day to see. Persons afflicted with this disease cannot see at all, or see very imperfectly, by candlelight, or moonlight. The medical name of this disease is *hemeralopia* (from *ἡμερα*, day, and *ὀπτομαι*, to see.) Heber says it is very common in India.—*Nyctolopia* (from *νὺξ*, night, and *ὀπτομαι*, to see), a disease in which the patient sees little or nothing by daylight, but sees better than others in the dark, is sometimes improperly called *night-blindness*.

NIGHT-BLOOMING CEREUS. See *Cactus*.

NIGHT-HAWK (*caprimulgus Americanus*). The night-hawk, which is also called a *bat* in some of the Southern States, is universally known in the United States. It commonly appears in Pennsylvania about the latter end of April, and is to be seen towards evening, in pursuit of its prey, which consists of beetles and other large insects. The female begins to lay about the middle of May. She makes no nest, depositing her eggs on the bare ground, though always in a dry situation. The eggs are usually two in number, rather oblong, equally thick at both ends, of a dirty bluish-white, marked with numerous blotches of dark olive brown. Like the goat-sucker of Europe, the night-hawk always sits lengthwise on the branch on which it roosts, and not across it, like other birds. When incubation commences, the male keeps a vigilant watch around. When the young are first hatched, they are covered with a down of a pale-brownish colour. The night-hawk is a bird of strong and vigorous flight, and great expanse of wing. It often visits cities, darting and uttering its peculiar squeak over the streets at a great height, diving down perpendicularly, and producing a hollow sound, which has been aptly compared to blowing strongly into the bung-hole of an empty hogshead. When the weather is wet and gloomy, these birds are to be seen abroad at all times of the day, though their usual time of appearance is from two hours before sunset till dark. When wounded, they attempt to intimidate by opening their mouth to its utmost stretch, throwing the head forwards, uttering a kind of guttural, whizzing noise, and striking violently with their wings. They begin to go south about the middle of August, and, by the middle of September, few are to be seen in Pennsylvania. The night-hawk is nine and a half inches in length, and twenty-three in extent; the upper parts are of a very deep blackish-brown, thickly sprinkled with minute spots, and streaks of a pale cream colour, on the back and head. The tail is somewhat shorter than the wings when shut, and is forked; the mouth is large, and has no bristles about it. The night-hawk bears some resemblance to the two other species of *caprimulgus* which are found in the United States—the chuck-wills-widow and whip-poor-will (q. v.) See Wilson, *Ornithol.*, v. p. 65.

NIGHTINGALE (*motacilla luscinia*). This small bird, which is so celebrated for its vocal powers, has but little to recommend it in the beauty of its plumage. The upper part of its body is of a rusty brown, tinged with olive; the under parts are of a pale ash colour, almost white at the throat and belly. It is about six inches in length. The nightingale is a bird of passage, appearing in Europe about the beginning of April, and leaving it early in the autumn. It is solitary in its habits, never associating in flocks, like most of the smaller birds. The female builds in low bushes or hedges, near water, and lays from four to five olive-green eggs. This bird perhaps owes some of its fame to the circumstance of its singing during the evening and night, when every sound is heard to advantage, and has a powerful effect on the imagination. But it is not to its power of song alone that this bird is indebted for its celebrity; wonderful stories are told of its oratorical talents. Gesner gravely relates that two, kept at Ratisbon, spent whole nights in discoursing on politics; and Pliny states that Germanicus and Drusus educated one so perfectly, that it delivered speeches both in Latin and Greek. The proper food for nightingales is spiders, wood-lice, ant eggs, flies, and worms. They are subject to various diseases, for which, according to some bird fanciers, the best antidote or preventive is, to give a black spider, every day for six days, in the month of March.

NIGHTMARE. See *Incubus*.

NIGHTSHADE (*solanum nigrum*); a common weed in waste places. The stem is eight or ten inches high, and is furnished with oval and more or less angular leaves. The flowers are small, white, scattered here and there upon the branches, in bunches of five or six, and are succeeded by small black berries. It possesses narcotic properties, though not so dangerous as was once supposed, and was formerly much employed in medicine, but at present is only used for external applications. The bitter-sweet (*S. dulcimara*) is also sometimes called *nightshade*. The stem is woody, and divides at base into several long, flexuous branches, which twine round and support themselves upon the surrounding plants. The leaves are, some of them, oval-lanceolate and entire, and others with two lateral lobes at the base. The flowers are larger than those of the preceding, of a fine violet colour, and are disposed in corymbs along the branches. The fruit consists of ovoid, bright red berries, which, for a long time, were supposed poisonous: lately, however, they have been administered to various animals in large quantities,

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tered in passing through streams of air of different densities, as in the experiment of mixing atmospheric air and hydrogen. At midnight, on the contrary, when the air is transparent, and of uniform density, as may be seen by the brilliancy and number of the stars, the slightest sound reaches the ear without interruption. M. Chladni has illustrated the effect of mixed medium by an elegant experiment of easy repetition. If we pour sparkling Champaigne into a tall glass till it is half full, the glass cannot be made to ring by a stroke upon its edge, but admits a dull, disagreeable, and puffy sound. This effect continues as long as the effervescence lasts, and while the wine is filled with air-bubbles. But as the effervescence subsides, the sound becomes clearer and clearer, till, at last, the glass rings as usual, when the air-bubbles have disappeared. By reproducing the effervescence, the sound is deadened as before. The same experiment may be made with effervescing malt liquors, and with still more effect by putting a piece of sponge, or a little wool or tow, into a tumbler of water. The cause of the result obtained by M. Chladni is, that the glass and the contained liquor, in order to give a musical tone, must vibrate regularly in unison as a system; and if any considerable part of a system is unsusceptible of regular vibration, the whole must be so. Baron Humboldt has employed this interesting experiment to illustrate and explain the phenomenon of distant sounds being more distinctly heard during the night.

without producing any deleterious effects. The deadly-nightshade (*atropa belladonna*) is, on the other hand, a dangerous plant, and frequently produces fatal effects, where it grows abundantly in waste places. The stem is about three feet high, a little hairy, herbaceous, and branching. The leaves are large, oval, acute, and softly pubescent. The flowers are solitary, bell-shaped, and of a dull purple colour. They are succeeded by black berries, which are so much the more dangerous, as their taste is sweetish and rather agreeable. The extract, dissolved in water and applied to the eye, possesses the remarkable property of dilating the pupil, and is, in consequence, employed in surgical operations for that purpose. The plant belongs to the *solanaceæ*, the same natural family with the preceding.

NIGRINE. See *Titanium*.

NIGRITIA, SOUDAN, or TAKROUR; a general name for the interior parts of Africa, some portions of which are yet unknown, and some have been only recently explored by Clapperton, Caillé, Lander, &c. It contains a great number of kingdoms, or countries, among which are Bambarra, Timbuctoo, and Kong on the west; Houssa, Borgou, Yarriba, Nyffe, Funda, Bournou, Mandara, Begharmi, and Kanem in the centre; Bergoo, Darfur, Kordofan, Donga, and the country of the Shillooks, to the east. It lies between 6° and 17° N. lat., and 8° W. and 32° E. lon. It is bounded on the north by Sahara, on the east by Nubia, on the south by the Mountains of the Moon and Lower Guinea, and on the west by Senegambia. As thus described, it is about 2500 miles from west to east, 500 from north to south, with a superficial area of 1,250,000. It contains some lofty mountains; some of the summits of the Mountains of the Moon being covered with perpetual snow; the Kong range is in the south-western part of the country. In the centre is lake Tchad, into which the Yeou and the Shary, two large rivers from the south-west, empty themselves; the north-eastern borders of the lake have not been examined. The Niger (q. v.) rises in the western part of Nigritia, and, after an easterly course, flows south into the gulf of Guinea. During eight or nine months, the heat is very great. In the rainy season (from June to September), the country is covered with a most luxuriant vegetation. The soil, in general, is fertile, producing maize, rice, millet, cotton, hemp, melons, indigo, dates, the gooroo, or Soudan, nut, &c. The gigantic baobab, the butter-tree, various resinous trees, &c., are found in the forests. Camels, dromedaries, asses, horses, sheep, goats, and horned cattle are numerous. Lions, leopards, hyænas, wolves, jackals, rhinoceroses, elephants, giraffes, monkeys, crocodiles, &c., are found in the woods or rivers. A great portion of the country being populous, we may suppose it to contain about 20,000,000 inhabitants. They are more advanced in civilization than the negroes of the coast, to whom our knowledge has, till lately, been principally confined. They exercise some of the mechanical arts with skill, and an important commerce is carried on with the Barbary states, Egypt, and Nubia, by Moorish merchants, in caravans. Slaves, ivory, gum, ostrich feathers, &c., are the most considerable articles of export. The discovery of a great navigable river, running through the heart of the country, and accessible to Europeans from the sea, must have a most important influence on the condition of this country. Park, Clapperton, and Caillé have furnished us with nearly all the information which we possess concerning these regions, which were but indistinctly known to the ancients under the general name of *Ethiopia*. The Journal of the Landers gives some further materials relating to the south-western part.

NIHIL ALBUM; a name formerly given to the white oxide of zinc.

NILE; a large of river of Africa, which flows through Nubia and Egypt. Below Cairo, where it is 1000 yards wide, it divides into two main branches, which again separate into several arms, the extreme eastern and western of which give to the lower part of Egypt the form of a delta (q. v.). There were anciently reckoned seven principal mouths by which its waters were poured into the Mediterranean; only those of Damietta and Rosetta are at present navigable; the others have been choked up. The sources of the Nile have never been accurately determined. Among the Greeks and Romans, this river excited the greatest interest; from its being the largest known to them, from its inundation, of which they had no other examples, and were ignorant of the cause, and from its unknown origin. The name *Nile*, according to Spineto (*Lectures on Hieroglyphics*), is Greek; the Egyptians calling it merely *Iaro*, which means *river*. The true Nile is formed by the confluence of the *Bahr-el Abiad* (white river) and the *Bahr-el-Azrek* (blue river), in lat. 15° 40′ N. The former, rising in Abyssinia, to the south-west of lake Dembea, comes from the south-east, and was considered by Bruce as the Nile. The latter, however, which comes from the south-west, and is supposed to rise in the Mountains of the Moon, brings down the greatest mass of water, and is considered by Cailliaud as the true Nile. (See *Meroe*.) This is a mere dispute about words. In lat. 17° 40′, it receives the Tacazze from the east, enters Egypt in 24°, following nearly a northern course, and below Cairo (30° 15′ N.) divides into the two main arms above-mentioned, the Damietta, or the eastern, and the Rosetta, or western branch. The distance from the confluence of its two head branches to the sea is about 1500 miles; from its highest sources, probably not far from 2500 miles. The cataracts so much celebrated by the ancients, modern discoveries have shown to be insignificant; they appear to be hardly any thing more than what in America are called *rapids*. In Upper Egypt, it is confined between two ranges of mountains, which leave only a narrow strip on each side of the river. Near Cairo, the river valley widens, and the level nature of the country below allows it to spread itself over a wide plain. The seven mouths were called, by the ancients, the *Canopic*, the most western (probably to lake Edko or Mareotis), the *Bolbitic* (the Rosetta branch), the *Sebennitic* (probably terminating in lake Bourlos), the *Phatnitic* or *Bucolic* (now the Damietta branch), the *Tanitic*, the *Mendesian*, and the *Pelusiac* (the most easterly), which entered the sea at different points of what is now lake Menzaleh. In Upper and Middle Egypt, there are great numbers of canals on the left bank of the river, which serve to irrigate the country: the principal, called the *canal of Joseph*, communicates with lake Mœris. (q. v.) The inundations of the Nile are owing to periodical rains, which fall to the south of the seventeenth degree. They begin in March, but have no effect upon the river until three months later. Towards the end of June, it begins to rise, and continues rising at the rate of about four inches a day, until the end of September, when it falls for about the same period of time. Herodotus informs us that, in his time, a rise of sixteen cubits was sufficient to water the country: at present, twenty-two cubits are considered a good rise. A rise of twenty-six cubits, in 1829, destroyed a great many villages, with their inhabitants. The lower part of Egypt has, therefore, been very much raised since the time of Herodotus, by the accumulated deposits of rich slime brought down by the river. (See *Egypt*.) This mud, which is composed principally of argillaceous earth and carbonate of lime, serves to fertilize the overflowed lands, and is used for manure for such places as are not sufficiently saturated by the river: it is also formed into bricks, and various vessels for domestic use, &c. The present pacha (see *Mohammed Ali*) has opened many of the old canals, which had been closed for centuries, and dug new ones: among the latter, the canal of Mahmood, connecting the harbour of Alexandria with the Nile, near Fouah, forty-eight miles long, ninety feet broad, and eighteen deep, is a magnificent work. Among the animals with which the Nile abounds, the most remarkable are the crocodile and the hippopotamus. In the ancient Egyptian mythology, the Nile was revered as the tutelary deity of the country. The Greeks make him the son of Pontus and Thalassa, or of Oceanus and Tethys. Memphis is said to have been his daughter. When the waters began to rise, the inhabitants celebrated the festivals called *Niloa*, sacrificed a black bull to him, strewed lotus flowers on the water, &c. In the city of Nilopolis, a temple was erected to him. His attributes are the crocodile, the sphinx, the hippopotamus, and the dolphin. The Nile has been personified in several statues, particularly in a very noble one of black marble, now in the Vatican. He is distinguished by his large cornucopia, by the sphinx couched under him, and by the sixteen little children playing around him. By the sixteen little children are understood the several risings of the river every year, as far as to sixteen cubits. The black marble is said to be in allusion to the Nile's coming from Ethiopia. The water flows down from under his robe, which conceals his urn, to denote that the head of the river was impenetrable. In some modern statues, the head of this figure is quite hidden under his robe for the same reason. An instrument, called a *nilometer*, was constructed by the ancient Egyptians, consisting of a rod or pillar, marked with the necessary divisions, for the purpose of ascertaining the proportionate increases of the flood of the Nile. It is said by several Arabian writers to have been first set up by Joseph during his regency in Egypt. The measure of it was sixteen cubits.

NILOMETER. See *Nile*.

NIMBUS, or GLORY; the halo, or collection of rays surrounding, in ancient times, the heads of certain deities, kings, and emperors, and, since the establishment of Christianity, the heads of Christ and the saints. Some have attributed the origin of the custom to the practice, in the Roman triumphs, of placing a common round shield over the head of the triumphant leader, and have supposed that the coverings which protected the heads of the statues of the gods from filth and dust, were called by the same name, and that these rays were at first added for ornament, whence sprung afterwards the real halo, or glory. But it is probable, from the numerous legends in which holy children are described with glories, that they owe their origin to an ancient Oriental symbol.—*Nimbus* is the Latin for *cloud*. See *Clouds*.

NIMEGUEN (anciently *Noviomagus*); a strong city in the Dutch province of Guelderland, delightfully situated on a steep hill, reaching down to the Waal; lat. 51° 51′ N.; lon. 32° 46′ E.; population 13,325. Most of the streets are narrow and dark. The principal of the nine churches is a handsome building. On a height near the river are seen the ruins of an old tower, said to have been built by Charlemagne. The town house contains a rich collection of Roman antiquities. The Belvedere, a high tower, from which there is a most extensive view, is near the beautiful public walk, the *Kalverbosch*. The pale beer (*Moll*) of Nimeguen is famous. Nimeguen is celebrated for two treaties of peace, concluded in 1678, between Spain, France, and Holland, and, in 1679, between Germany and Sweden.

NIMES, or NISMES (*Nemausus*); a city of France, capital of the department of the Gard; lat. 43° 50′ N.; lon. 4° 21′ E.; 350 miles south-east of Paris; episcopal see, and the seat of several departmental authorities. It is situated in a delightful plain, and is surrounded with *boulevards*, which occupy the place of the former fortifications. It contains some handsome public buildings, among which are the *palais-de-justice*, an hospital, and cathedral. The public walks are magnificent. The population is 39,068, of which a great number are Calvinists. The inhabitants are principally employed in manufactures, chiefly of silk and cotton. It has considerable commerce in wine, oil, essences, drugs, dye-stuffs, &c. Nimes, next to Rome, contains the greatest number of monuments of Roman grandeur: among them are the square house (*maison carrée*), an ancient temple, built by Adrian, seventy-six feet long, thirty-eight broad, and forty-two high, with thirty beautiful Corinthian columns (it was repaired by Louis XIV., and again in 1820); the amphitheatre, a noble circus of the Doric order, the walls of which, composed of enormous masses of stone, united with admirable skill, and about 1200 feet in circumference, are in good preservation; the beautiful fountain of Diana, with its baths and trees; the temple of Diana, in ruins; and the ancient tower *Magne*, on a hill outside of the city, the original destination of which is unknown. Very fine mosaics have been found here, and numerous fragments of ancient buildings, with Greek and Latin inscriptions. Nimes is supposed to have been built by a Greek colony, and was afterwards, for about 500 years, in the possession of the Romans. In the sixteenth century it became a stronghold of Calvinism (see *Huguenots*), and suffered much during the civil wars. In 1815 (see *France*), it was the scene of religious violence in consequence of the reaction of that period. See Millin's *Voyage dans les Départements du Midi;* Menard's *Histoire des Antiquités de Nimes* (1822).

NIMROD; a valiant warrior, who, according to the Mosaic account, lived before 2000 B. C., and is generally supposed to have been the first conqueror who substituted the monarchical yoke for the patriarchal independency of the nomadic tribes. Babylon and the monarchy of Nimrod were founded by him, and enlarged by the conquest of the towns (fortified tribes) of Erech (afterwards Edessa), Acad (afterwards Nisibis), and Calneh (afterwards Ctesiphon, in Mesopotamia). Herder calls him the builder of the tower of Babel, and considers the representation of him, as a powerful hunter, merely a figurative designation of the tyranny and artifice by which he subjected and united the wild nomadic tribes.

Nimrod, in Chaldaic and Arabic, signifies a *rebel*.

NINE; used by the English poets for the *Muses* (q. v.), on account of their number.

NINEVEH. See *Ninus*.

NINON DE L'ENCLOS. See *L'Enclos*.

NINTH, in music; an interval containing an octave and a tone; also a name given to the chord, consisting of a common chord, with the eighth advanced one note.

NINUS was, according to an uncertain tradition, an Assyrian king, the successor of Belus, and one of the greatest conquerors in Asia. He extended the Assyrian kingdom to the borders of India, to the Nile and the Tanais, married Semiramis, the wife of Medon, one of his generals, who had assisted him, by stratagem, in the conquest of Bactra, the capital city of the Bactrians, and built Nineveh, the capital of his own kingdom, which, according to Niebuhr, is situated on the east side of the Tigris, opposite Mosul. His son was Ninyas. His kingdom is considered as having been founded between 2000 and 2100 years B. C.

NIOBE, daughter of Tantalus (king of Lydia) and of Dione, or Euryanassa, was the wife of Amphion, who, in common with Zethus, governed Thebes, which they had built. According to the common accounts, she had seven sons and seven daughters, and, proud of her blooming offspring, she so far forgot herself as to exalt herself above Latona, the mother of only two children—Apollo and Diana; and in punishment of her presumption, she had to witness the destruction of her children by the arrows of the twin deities. Anguish and despair transformed the wretched mother, after long wanderings, into a stone, which was shown on mount Sipylus, in the kingdom of her father. Amphion and Zethus also fell, pierced by the arrows of Apollo, when, full of wrath, they penetrated into the sanctuary of the god. This is the most common account of the fate of Niobe, in the circumstances of which poets frequently differ, who have taken this story for a subject as often as artists. The origin of the fable seems to lie in the ancient figure of speech, by which it was said of young people who died suddenly, that they had been struck with the arrows of Apollo or Diana; and, in almost all languages, petrifaction is the natural image of the highest degree of torpid despair. One of the most beautiful exhibitions of ancient art is contained in the group of Niobe. The statues forming this group were dug up in 1583, near the Porta Lateranensis, in Rome, were purchased by the cardinal Ferdinand de' Medici, who caused them to be placed in the villa Medici, and, in 1772, were conveyed to Florence by the grand-duke Leopold, where, in 1777, they were placed in the Rotunda la Tribuna, after their restoration by Vincenzo Spinazzi. The group consists of fourteen statues, and is considered to be the one described by Pliny. Respecting its author nothing certain was, even in his time, known; some, with Pliny, attributed it to Scopas; others, to Praxiteles: Winkelmann declared himself for Scopas. Equally ignorant are we respecting the original combination of the single figures. It has hitherto been the more difficult to form an opinion, inasmuch as several of them, the "two wrestlers," as they are termed, the pedagogue (whom Fabroni takes for king Amphion), and one of the daughters (whom Goethe thinks an Erato), have been pronounced by the best connoisseurs not to belong to this group, although they were all found in one place and at the same time. The British architect Cockerell, in an essay, in 1816, proposed the conjecture that these celebrated statues were arranged on a line pyramidally, and constituted the ornaments of the front of some ancient temple; and it is well known that the Greek architects were fond of decorating the fronts of their temples in such a manner. The supposition is corroborated by the examinations which the British artist himself made of the single statues. Their heights, diminishing on both sides so as to form the sides of a triangle; their attitudes, perfectly adapted to such a situation; all of them pressing towards the centre, formed by the mother as the highest statue; and then the remarkable neglect, and even intentionally imperfect workmanship of the back of most of these statues, which evidently shows that the artist had thought only of the effect produced by a front view of his work, destined for exhibition on a wall;—all these considerations make it probable that this group was designed for such an architectural embellishment. Cockerell has illustrated this arrangement by a sketch, etched by himself on stone.

NIPHON. See *Japan*.

NISBET, Charles, D. D., first president of Dickinson college, Pennsylvania, was born in 1736, at Haddington, Scotland, and received his education in Edinburgh. For several years he officiated as minister of Montrose, and, in 1783, when the college in Carlisle was instituted, was invited to become its president. In 1785, he entered upon the duties of that station, and continued to fulfil them until his death, January 17, 1804, in the sixtieth year of his age. The learning of doctor Nisbet was very extensive. He was an admirable classical scholar, and particularly conversant with Greek. At one time he could repeat the whole of the Æneid and of Young's Night Thoughts; indeed, his power of quotation generally was inexhaustible. He was endowed with genuine wit, and was sometimes inclined to be sarcastic. His sermons were impressive and powerful. In disposition, he was sincere, benevolent, and humane.

NISI PRIUS. Trial at *nisi prius* is a name often given in England to trial by jury, in the superior courts. The term originated, in the English courts, in the following way: Questions of fact, in all causes commenced in the courts of Westminster hall, are, by course of the courts, appointed to be tried on a day fixed in some Easter or Michaelmas term, by a jury returned from the county wherein the cause of action arises; but with this proviso,—*Nisi prius justiciarii ad assisas capiendas venerint;* that is, unless before the day fixed, the judges of assize come into the county in question, which they always do in the vacation preceding each Easter and Michaelmas term, and there try the cause; and then, upon return of the verdict given by the jury to the court above, the judges there give judgment for the party for whom the verdict is found. The commission under which these judges of assize act is called a "commission of *nisi prius*," and, as the jury trials take place before them, while the judges in Westminster hall settle questions of law, these jury trials are called "trials at *nisi prius*."

NISMES. See *Nimes*.

NITRATE OF SILVER. See *Silver*.

NITRE; the common name of nitrate of potash. See *Potash*.

NITRIC ACID. See *Acid*, and *Nitrogen*.

NITROGEN; the name of an elastic fluid, discovered by doctor Rutherford, in 1772. It derives its name from its forming the basis of nitric acid. Lavoisier discovered, in 1775, that it is a constituent part of the atmosphere—a discovery which was also made, at about the same time, by Scheele. It is most easily procured by burning phosphorus in atmospheric air, which abstracts the oxygen; and the residual gas, after agitation with water, or solution of potash, is pure nitrogen. By exposing air to the liquor formed by boiling sulphur and lime with water, we obtain, in the course of a few days, very pure nitrogen; also, if a few pieces of flesh or muscular fibre be put into a retort, and nitric acid, diluted with four or five parts of water, be added, and a moderate heat applied, nitrogen gas will be disengaged, not, however, in a state of complete purity. This gas has been known by various names, as corrupted air, mephitic air, phlogisticated air, and azote, the latter application having been derived from α *privative*, ζωη, life, in allusion to its unfitness for respiration—a character, however, common to many gases. Nitrogen gas is invisible, insipid, and inodorous. It is lighter than atmospheric air, its specific gravity being to that of the latter as ·9722 to 1. The weight of 100 cubic inches is 29·6527 grains. It is principally characterized by certain negative qualities, and by the nature of the compounds which it forms. It is uninflammable, and incapable of supporting combustion, a burning body immersed in it being immediately extinguished. It is equally incapable of supporting animal life by respiration; not, however, through any operation as a poison, but simply from the exclusion of oxygen. It is not perceptibly absorbed by water. Its peculiar characters, as a distinct substance, are better shown in its chemical combinations. It unites with oxygen in different proportions, and forms compounds possessed of very peculiar chemical properties. Compounds of it with chlorine and iodine may be obtained; and it is a chief ingredient in the products of the animal kingdom. It unites, too, with hydrogen, forming one of the alkalies—ammonia. What purposes are served by the nitrogen in the atmosphere, is not clearly understood. Its most obvious use is as a diluent to moderate the action of oxygen; but, as it is found to exist in large quantities in all animal substances, it is probably of more direct utility to some part of the animal system.

Nitrogen unites with oxygen in four proportions, forming as many direct compounds. These are, 1. protoxide of azote, or nitrous oxide; 2. deutoxide of azote, nitrous gas, or nitric oxide; 3. nitrous acid; 4. nitric acid.

Nitrous oxide, or *protoxide of azote*, was discovered by doctor Priestley, in 1772, but was first accurately investigated by Sir H. Davy, in 1799. The best mode of procuring it is to expose the salt called nitrate of ammonia to the flame of an Argand lamp in a glass retort. When the temperature reaches 400° Fahr., a whitish cloud will rise into the neck of the retort, accompanied by the copious evolution of gas, which must be collected over mercury for accurate researches, but, for common experiments, may be received over water. It has all the physical properties of common air. It has a sweet taste, a faint, agreeable odour, and is condensable by about its own volume of water. A taper plunged into it burns with great brilliancy, the flame being surrounded with a bluish halo. Sulphur and most other combustibles require a higher degree of heat for their combustion in it than in either oxygen or common air. Specific gravity, 1·5277. It is respirable, but not fitted to support life. Sir H. Davy first showed that, by breathing a few quarts of it, effects analogous to those occasioned by drinking fermented liquors were produced. Individuals who differ in temperament are, however, differently affected. Sir H. Davy describes the effect it had upon the following persons thus: "Mr James Thomson—involuntary laughter; thrilling in his toes and fingers; exquisite sensations of pleasure. A pain in the back and knees, occasioned by fatigue the day before, recurred a few minutes afterwards. A similar observation, we think, we have made on others; and we impute it to the undoubted power of the gas to increase the sensibility, or nervous power, beyond any other agent, and probably in a peculiar manner. Mr Robert Southey could not distinguish between the first effects and an apprehension of which he was unable to divest himself. His first definite sensations were a fullness and dizziness in the head, such as to induce the fear of falling. This was succeeded by a laugh which was involuntary, but highly pleasurable, accompanied by a peculiar thrilling in the extremities—a sensation perfectly new and delightful. For many hours after this experiment, he imagined that his taste and smell were more acute, and is certain that he felt unusually strong and cheerful. In a second experiment, he felt pleasure still superior, and has since poetically remarked that he supposes the atmosphere of the highest of all possible heavens to be composed of this gas. In persons of great susceptibility, the inspiration of this gas has been known to produce unpleasant and even alarming symptoms: by such it cannot be inhaled with impunity. Before concluding our account of it, we must explain the theory of its production from the nitrate of ammonia. The sole products of the operation above described are water and the nitrous oxide gas. Nitrate of ammonia is composed of

Nitric acid, ...	54, one proportion;
Ammonia, ...	17, one proportion;
	71

Nitric acid consists of

Nitrogen, ...	14, one proportion;
Oxygen, ...	40, five proportions;
	54

and ammonia of

Nitrogen, ...	14, one proportion;
Hydrogen, ...	3, three proportions.
	17

By the action of heat, these elements arrange themselves in a new order. The hydrogen takes so much oxygen as is sufficient for forming water, and the residual oxygen converts the nitrogen both of the nitric acid and of the ammonia into the protoxide of nitrogen. The decomposition of 71 grains of the salt will therefore yield

Water	27, or 3 proportions	Oxygen,	24, or 3 proportions
		Hydrogen,	3, or 3 proportions.
Nitrous oxide,	44, or 2 proportions	Oxygen,	16, or 2 proportions.
		Nitrogen,	28, or 2 proportions.
	71		

The *nitric oxide*, nitrous gas, or deutoxide of nitrogen, was discovered by doctor Hales, but its properties were first investigated by doctor Priestley. It is obtained by the action of diluted nitric acid on metals, the metal abstracting a portion of the oxygen from the acid, and converting it into nitric oxide, which assumes the elastic form. It is not always evolved pure, nitrous acid and nitrogen gas being often formed at the same time. Its purity is enhanced when the metal copper or quicksilver is used. It is a colourless gas. When mingled with common air, or any gaseous mixture that contains oxygen in an uncombined state, dense, suffocating, acid fumes, of a red or orange colour, are produced, called *nitrous acid vapours*, which are copiously absorbed by water, and communicate acidity to it. Nitric oxide is thus distinguishable from every other substance, and, for the same reason, affords a convenient test for detecting the presence of free oxygen, wherever it exists in gaseous mixtures. It does not redden the vegetable blues; is sparingly soluble in water. Burning sulphur and a lighted candle are instantly extinguished by it; but charcoal and phosphorus, if in the state of vivid combustion at the moment of being immersed in it, burn with increased brilliancy. It is quite irrespirable, exciting a strong spasm of the glottis, as soon as an attempt is made to inhale it. It is partially decomposed by being passed through red hot tubes. Two volumes of the nitric oxide yielded Sir H. Davy one volume of nitrogen, and about one of carbonic acid, in his decomposition of it by means of burning charcoal, whence it is inferred to consist of equal measures of oxygen and nitrogen gases united, without any condensation.

Nitrous acid is obtained by exposing nitrate of lead to heat in a glass retort. Pure nitrous acid comes over in the form of an orange-coloured liquid. It is so volatile as to boil at the temperature of 82°. Its specific gravity is 1·450. When mixed with water, it is decomposed, and nitrous gas is disengaged, occasioning effervescence. It is composed of one volume of oxygen, united with two of nitrous gas. The various-coloured nitric acids found in commerce are not nitrous acids, but nitric acid, impregnated with nitrous gas.

Nitric acid was first obtained by distilling a mixture of nitre and clay, during the thirteenth century, by Raymond Lully, a chemist of the island of Majorca.

Basil Valentine, in the fifteenth century, describes the process more minutely, and calls the acid *water of nitre*. Subsequently it was called *spirits of nitre*, and *aqua fortis*. Nitric acid is prepared as follows: Three parts of pure nitrate of potash, coarsely powdered, are to be put into a glass retort, with two of strong sulphuric acid. To the retort is united a tubulated receiver, and heat is applied to the retort by a sand bath. The first product that passes into the receiver is generally red and fuming, but these appearances soon subside, and the acid comes over pale, and even colourless. After this it again becomes more red and fuming, till the end of the operation. The acid obtained, provided the process be carefully conducted, will have a specific gravity of 1·5; and acid of this density may be obtained, amounting to two-thirds of the weight of the nitre employed. The receiver requires to be refrigerated by cold water or ice. When a strong nitric acid is not the object, but it is intended simply to manufacture the common dilute acid, called, in commerce, *aqua fortis*, less sulphuric acid, in proportion to the nitre, will suffice: 100 parts of good nitre, sixty of strong sulphuric acid, and twenty of water, form economical proportions. Nitric acid, having a specific gravity 1·5, contains nearly eighty-six per cent. of acid, and fourteen of water. It has been formed by electrizing, for a great length of time, a mixture of oxygen and nitrogen gases, in the proportion by measure, of five parts of oxygen to three of common air, or seven of oxygen to three of nitrogen, or common air by itself. A little water is contained in the tube, holding potash in solution which, after the experiment, becomes converted into nitrate of potash. This experiment was first performed in 1785, by Mr Cavendish, who inferred from it that nitric acid is composed of oxygen and nitrogen. Nitric acid, as obtained in the laboratories of the arts, frequently contains portions of sulphuric acid and of muriatic acid. The former is derived from the acid which is used in the process, and the latter from sea-salt, which is frequently mixed with nitre. These impurities may be detected by adding a few drops of a solution of muriate of barytes, and nitric of silver, to separate portions of nitric acid, diluted with three or four parts of distilled water. If the muriate of barytes cause a cloudiness or precipitate, sulphuric acid must be present; if a similar effect be produced by nitrate of silver, the presence of muriatic acid may be inferred. Nitric acid is purified from sulphuric acid by redistilling it from a small quantity of the nitrate of potash, with the alkali of which the sulphuric acid unites and remains in the retort. To separate the muriatic acid, it is necessary to drop a solution of nitrate of silver into the nitric acid as long as a precipitate is formed, and draw off the pure acid by distillation. Nitric acid possesses acid properties in an eminent degree. It unites with and neutralizes alkaline substances, forming with them salts, which are called *nitrates*. When of a specific gravity of 1·5, it emits dense, white, suffocating fumes, if exposed to the air, from which it attracts moisture, and experiences a diminution in its density and strength. A rise of temperature is occasioned by mingling it with water in a certain proportion. From its strong affinity for water, it occasions snow to liquefy with great rapidity. It boils at 248° Fahr., and may be distilled without suffering material change. It may be frozen at about 50° below zero: when diluted with half its weight of water, it becomes solid at 1½° F. Nitric acid acts powerfully on substances which are disposed to unite with oxygen; and hence it is much employed by chemists for bringing bodies to the maximum of oxidation. Nearly all the metals are oxidized by it, and some of them, such as tin, copper, and mercury, are attacked with great violence. If flung on burning charcoal, it increases the brilliancy of its combustion in a high degree. Sulphur and phosphorus are converted into acids by its action. All vegetables are decomposed by it. In general, the oxygen of the nitric acid enters into direct combination with the hydrogen and carbon of those compounds, forming water with the first, and carbonic acid with the second. This happens remarkably in those compounds in which hydrogen and carbon are predominant, as in alcohol and the oils. It effects the decomposition of animal matters also. The cuticle and nails receive a permanent yellow stain when touched with it; and, if applied to the skin in sufficient quantity, it acts as a powerful cautery, destroying the organization of the part entirely. When oxidation is effected through the medium of nitric acid, the acid itself is commonly converted into the deutoxide of nitrogen, which is sometimes evolved in a state of purity, but more commonly mingled with nitrous oxide and nitrous acid gases. The direct solar light deoxidizes nitric acid, resolving a portion of it into oxygen and nitrous acid. When the vapour of nitric acid is transmitted through red-hot tubes, it suffers complete decomposition, and a mixture of nitrogen and oxygen gases is the product. Nitric acid is of considerable use in the arts. It is employed for etching on copper; as a solvent of tin, to form with that metal a mordant for some of the finest dyes; in metallurgy and assaying, in various chemical processes, on account of the facility with which it parts with its oxygen and dissolves metal; in medicine as a tonic, as also in the form of vapour to destroy contagion. For the purposes of the arts, it is commonly used in a diluted state, and contaminated with the sulphuric and muriatic acids by the name of aqua fortis, two kinds of which are found in the shops, —one called double aqua fortis, which is about half the strength of nitric acid; the other simply aqua fortis, which is half the strength of the double. A compound made by mixing two parts of the nitric acid with one of muriatic, known formerly by the name of *aqua regia*, and now by that of *nitro muriatic acid*, has the property of dissolving gold and platina. On mixing the two acids, heat is given out, an effervescence takes place, and the mixture acquires an orange colour. Nitrogen combines with chlorine and iodine to form two very remarkable compounds. The first of these, the *chloride of nitrogen*, is formed by the action of chlorine on some salt of ammonia. Its formation is owing to the decomposition of ammonia (a compound of nitrogen and hydrogen) by chlorine: the hydrogen of the ammonia unites with chlorine and forms muriatic acid, while the nitrogen of the ammonia, being presented in its nascent state to chlorine dissolved in the solution, enters into combination with it. The chloride of nitrogen is formed gradually, when a glass receiver, filled with chlorine gas, is inverted over a bowl containing a solution of muriate of ammonia, and falls in little globules through the fluid to the bottom of the dish, whence it is withdrawn with the utmost care by means of a glass syringe. On being injected into a metallic mortar, or leaden dish containing a little volatile oil, or phosphorus in small pieces, it detonates with extreme violence. Its specific gravity is 1.653: it is not congealed by the intense cold produced by a mixture of snow and salt; may be distilled at 160° Fahr., but explodes at a temperature between 200° and 212°. It consists of chlorine 144, or four proportions; nitrogen, 14, or one proportion.

Iodide of nitrogen. From the weak affinity that exists between iodine and nitrogen, these substances cannot be made to unite directly; but, when iodine is put into a solution of ammonia, the alkali is decomposed; its elements unite with different portions of aline, and thus cause the formation of hydriodic acid and iodide of nitrogen. The latter subsists in the form of a dark powder, which is characterized, like chloride of nitrogen, by its explosive property. It detonates violently as soon as it is dried, and slight pressure while it is moist produces a similar effect. Heat and light are emitted during the explosion, and iodine and nitrogen are set free. It consists of one proportional of nitrogen to three of iodine. With regard to the nature of nitrogen there has been, and still exists, considerable diversity of opinion. Berzelius has inferred, from speculations connected with the doctrine of definite proportions, that it is a compound of oxygen with an unknown base, to which he has given the name of *nitricum*, and has fixed the proportions at 44·32 of base, and 55·68 of oxygen; others, on the contrary, have affirmed, as a consequence of this doctrine, that nitrogen can contain no oxygen—a proof of the little value to be attached to such speculations. The strongest arguments for the compound nature of nitrogen are derived from its slight tendency to combination, and from its being found abundantly in the organs of animals which feed on substances that do not contain it. Its uses in the economy of the globe are little understood. This is likewise favourable to the idea that its real chemical nature is as yet unknown, and leads to the hope of its being decomposable. It would appear that the nitrogen of the atmosphere and oxygen combine in other proportions, than those in which they exist in the air, under certain circumstances. Thus we find that mild calcarious or alkaline matter favours the formation of nitric acid in certain regions of the earth; and that they are essential to its production in our artificial arrangements for forming nitre from decomposing animal and vegetable substances.

NITROUS OXIDE. See *Nitrogen.*

NIVOSE. See *Calendar.*

NIZAM DJEDID. See *Ottoman Empire.*

NIZZA. See *Nice.*

NOAH; the patriarch of whom we are told, in the book of Genesis, that God chose him, for his piety, to be the father of the new race of men which peopled the earth after the deluge. Having been admonished by God of the coming flood, he built a vessel by the direction of Jehovah, into which he entered with his family, and all kinds of animals. (See *Deluge.*) After the waters had subsided from the earth, the vessel which contained the progenitors of all living creatures, rested on mount Ararat, in Armenia, where Noah offered a thank-offering to God, and was assured that the earth should never again be destroyed by a flood. As a sign of this covenant with Noah, God set the rainbow in the clouds. Permission was now granted to the human race to eat flesh, provided they did not eat it raw with the blood; and murder was declared punishable by death. Noah then began to cultivate the earth, and planted a vineyard, and, having made wine, became intoxicated. While under the influence of the wine, his son Ham ridiculed the exposure of his father, while his other sons, Shem and Japheth, reverently covered him with a garment. When the patriarch awoke, and was aware of what had taken place, he gave his blessings to the filial piety of the latter, and pronounced a curse of servitude upon the posterity of the former. Noah died at the age of 950 years, 350 years after the flood.

NOAILLES; one of the oldest noble families in France. Among the members of this family, which has ever been invested with the first offices in the kingdom, are,

1. *Antoine de Noailles*, celebrated on account of his embassies under Henry II. The abbé Vertot has published an account of them. His brother, the bishop of Aix, was also employed on several important and difficult diplomatic missions to England, Italy, and even Constantinople.

2. *Anne Jules*, duke of Noailles, born 1650, inherited from his father the first company of the *gardes-du-corps*, and, in the war of 1689—97, commanded a *corps-d'-armée* in Catalonia; in 1693 was made marshal, and, in 1694, gained the battle of the Ter against the Spaniards. He died in 1708.

3. *Louis Antoine de Noailles*; brother of the preceding, archbishop of Paris and cardinal. On account of the aid which he afforded to Quesnel, he was persecuted by the Jesuits, and especially by Le Tellier, the confessor of Louis XIV. They prevailed on the pope to issue the bull *Unigenitus* (q. v.), which was resisted by Noailles, as archbishop of Paris, till he was finally compelled to yield, in his 78th year. He died soon afterwards, in 1729.

4. *Adrian Maurice*, duke of Noailles, son of the above-mentioned Anne Jules, served with distinction in Spain, in the Spanish war of succession, was created grandee of Spain, of the first class, and, in 1698, married Françoise d'Aubigné, a niece of madame de Maintenon. During the minority of Louis XV., he was president of the council of finance, and member of the council of regency, which he left, however, in 1721, rather than concede the presidency to cardinal Dubois. He was exiled by the influence of this intriguing priest, after whose death he was recalled, in 1723, when he was reinstated in his former offices. In 1734, he served under Berwick in the campaign on the Rhine, and at the siege of Philipsburg, and, after the death of Berwick, received the marshal's staff. In the following year he commanded the French army in Italy. When the Austrian war of succession broke out, after the death of the emperor, Charles VI., Noailles received a command on the Rhine. In 1743, by the unseasonable impetuosity of his nephew, the count of Grammont, he lost the battle of Dettingen, and, by this means, the fruits of the wise measures by which he had brought the British army to the verge of ruin. His age no longer permitting him to fight at the head of armies, he entered the ministry. With splendid talents, he united all the faults of the courtiers of the times. His friendship for marshal Saxe induced him, although an elder marshal, to serve him as first aid in the battle of Fontenoy. His two sons were, in 1775, made marshals of France. After his death, the abbé Millot published *Mémoires politiques et militaires pour servir à l'Histoire de Louis XIV., et de Louis XV., composés sur les Pièces originales recueillies par Adrien Maurice Duc de Noailles*, &c., which contains interesting information, not only respecting the history of the wars of Louis XIV. and XV., but also respecting the history of Spain under Charles II. and Philip V.

In later times, the following members of this family have rendered themselves distinguished.

Louis, viscount of Noailles, a general, and member of the first national convention, in 1789. Chosen by the nobility a deputy to the states-general, he proposed to his chamber, June 13, to form a union with the third estate. Montmorency, Rochefoucauld, Lafayette, &c., voted in the affirmative, and, after long debates, forty members of the chamber of nobles united with the national assembly, June 25. August 4, Noailles was the first who exhorted the clergy and nobility in the assembly to renounce their privileges, as injurious to the common weal. After the dissolution of the constituent assembly he went into the army, and, in 1792, commanded the chain of outposts at Valenciennes. His birth subjected him to suspicion: he demanded his dismissal, and lived in retirement in the country. Under the consular government, he returned to the service, and gained distinction in St Domingo, as general of brigade, under

Leclerc and Rochambeau. After the evacuation of the island, he embarked on board a vessel of war for Cuba, but was killed in a battle with the British, who took the vessel.

His son *Alexis*, count of Noailles, born at Paris, June 1, 1783, minister of state of Louis XVIII., was obliged to leave France in 1811, because he had incurred the suspicions of the imperial government, and for a time lived in Switzerland. The princes of the house of Bourbon sent him on important missions to the German courts, to Russia and to Sweden, after which he repaired to the residence of Louis at Hartwell, in England. In 1813, he served, as aid of the crown-prince of Sweden, in Germany. After the battle of Leipsic, he left the Swedish service, accompanied the allied army to France, and fought at Brienne and La Fere Champenoise, after which he joined the count of Artois at Vesoul, became his aid, and was afterwards the plenipotentiary of Louis XVIII. at the congress of Vienna. He returned with the king from Ghent to Paris, was chosen deputy of the chamber of 1815, and, in October of the same year, was appointed by Louis minister of state, but without any particular department. In 1828, count Alexis of Noailles was a member of the chamber of deputies, and, at the suggestion of the minister Portalis, was appointed by the king member of the commission to examine whether the schools of the clergy (the Jesuits, &c.) accorded with the fundamental principles of the French constitution.

Ant. Claude Dominique Juste, count of Noailles, cousin of the former, second son of the prince de Poix, born at Paris, August 25, 1777, was one of the first chamberlains of Napoleon, and remained in this post till 1814. After the restoration, he was the ambassador of Louis XVIII. at Petersburg, till superseded, in 1820, by the count de Ferronays.

NOBILITY. The history and political importance of a hereditary nobility—that is, a rank of society which claims the first civil honours and privileges above the rest of the citizens, by no other right but that of birth—is one of the most momentous and most contested points in the discussions on civil society, which has not yet been sufficiently explained by historical facts, notwithstanding the countless number of essays that have been published on this subject. Moreover, the variety of its forms, and relations to other classes of society, is so great, and even the origin of its existence so different, that we cannot safely pronounce a general judgment in its favour or against it. We cannot say, on the one hand, that such a difference of hereditary rank is indispensable to every nation, or, at least, to every monarchy; and, on the other hand, that it never has proved useful, and consequently ought to be abolished. We may, in the history of almost every nation, discern a period in which the great interests of mankind, knowledge and virtue, a love of moral beauty, and the charms of nature and art, have been cultivated and preserved by a select class of society; and, on the contrary, we may also distinguish another period, when these very treasures, which constitute the worth of a state, have been trampled upon by the same class. Thus the history of monarchies, both ancient and modern, shows plainly that the greatest obstacles in the way of peace, good order, and justice, have originated with the nobility, impatient of the restraint which the good of society requires, although very willing to flatter superior power, if they are allowed to participate in it. Revolutions have, till late years at least, almost always originated with a discontented nobility; and, for one prince whom popular insurrections have deprived of his throne and life, hundreds of others may be mentioned who have lost both by the conspiracies and factions of the nobility. The possession of extensive estates, with authority over numerous vassals and dependents, gives to the nobles a power which throws great difficulties in the way of monarchs who desire to protect the lower classes against injustice, and to preserve in them feelings of manliness and self-respect—difficulties against which the noblest monarchs and the ablest statesmen have often striven in vain. The result of such a strife frequently is, that the monarchical becomes, in fact, an aristocratical government; and from this there is but a small step to the introduction of a sovereign senate, composed of the privileged families. But such a government is truly most contradictory to reason; for it neither recognises the equality of all the citizens, nor the necessity of removing the contest for pre-eminence caused by the passions of men; and history teaches us that it is the most oppressive and most unjust of all governments. The usurpations of the patricians in Rome and Venice have been almost equalled, in modern times, by those of the nobility of Poland and Sweden. Montesquieu's celebrated remark, "*Point de monarque, point de noblesse: point de noblesse, point de monarque,*" is true only in a qualified sense. Lord Bacon, a far greater thinker, on the contrary, sets forth, in four positions, every thing that can be said against the nobility: "*Raro ex virtute nobilitas; rarius ex nobilitate virtus; nobiles majorum deprecatione ad veniam sæpius utuntur, quam suffragatione ad honores. Tanta solet esse industria novorum hominum, ut nobiles præ illis tanquam statuæ videantur; nobiles in stadio respectant nimis sæpe, quod mali cursoris est.*"—*De Augmentis Scientiar.* (lib. vii). The opinions of Franklin, Kant, Boileau, and Voltaire, on this subject, are generally known. Kant describes hereditary nobility as a rank which precedes merit, and is generally not even followed by merit. Reason bids us value in man none but moral excellence. Justice requires that the state should hold out equal privileges to all the citizens, without discrimination; protect their rights by equal laws, and prevent the few from subjecting the many. But this does not prove the inconsistency of a hereditary nobility with the best constitution which the circumstances of a particular state will allow, because time may have interwoven many valuable interests with it, and made them dependent upon it. It is plain that, in a state where the ideas of justice and citizenship are clearly understood, and well rooted, a privileged order is only desirable under very peculiar circumstances, for this simple reason, that all hereditary dignities, privileges, &c., are *irrational*. Human folly, however, may render it necessary to admit a hereditary monarchy, for the purpose of preventing by this evil (for every hereditary government is an evil) still greater ones. A new nation will never admit this privileged rank. The modern nobility had its origin in ages when power was the only law, and the usurpations of the stronger were confirmed by prescription. Thus it has become so much interwoven with all the interests of the several states, that its abolition would be a very difficult task. Norway, however, effected this object, in 1821, against the will of the king, whom the constitution, however, compelled to sign the decree, which had passed three times in the assembly of the states.

Considering this subject in a historical point of view, a hereditary nobility is found in the infancy of almost every nation, ancient and modern. It existed before the period of authentic history. Its origin is to be attributed to various causes; for the most part to military despotism; in some cases, to the honours paid to superior ability, or to the guardians of the mysteries of religion. The priestly nobility of the remotest antiquity has everywhere yielded to the superiority of military chieftains. The caste of the Bramins in India has surrendered its power to the caste of the Ketri, though the rulers on the islands of the Indian archipelago are even now obliged to pay the greatest respect to the descendants of the elder nobility, over whom they exercise unlimited power.—See Crawfurd's *History of the Indian archipelago* (London, 1820, iii. 33). Among the ancient German tribes, which gave its present form to modern Europe, only obscure traces of hereditary nobility are found, which, in later periods, was generally established throughout that continent. Many of them seem, however, to have recognised one ruling family, as the Saxons, Danes, and Normans the family of Odin; the Visigoths that of Balth; the Ostrogoths that of Amal; the Bavarians that of Agilolfing. These families seem to have stood in the same relation to their nations as the Incas to the Peruvians; for their founders (the *Asen*) so much excelled the mass of the people, and conferred such great benefits upon them, that a divine origin was attributed to them, and their descendants were, on this account, honoured during many ages. Besides these, no other hereditary nobility existed among the Franks, Saxons, Normans, Danes, Swedes, and most of the other nations of the North. The *Athelings* of the Saxons are exclusively members of the reigning house, and the same name frequently denotes only the successors to the throne. The *Antrustiones* and *Leudes* (*Liti*) of the Franks; the *Degenes* (*Thaini, Thani, Thegnas*, &c.) of the Saxons; the *Hirdmans* and *Dingmans* of the Danes and Normans, are not noblemen, in the modern sense of the word, but merely the successors of the prince's companions, described by Tacitus, and have gradually usurped a hereditary rank by the later addition of feudal property. The dignities of the counts of the Franks, the aldermen and great *thanes* of Britain, as also of the *jarls* (in England *Eorlas*) of Denmark, were accessible to every one distinguished by merit, and favoured by fortune. In France and Germany, the first hereditary nobility begins with the downfall of the Carlovingian dynasty; in England, with the conquest of the Normans, in the tenth and eleventh centuries; and was afterwards spread over all Europe; for, since that time, dignities, as well as lands, have become hereditary. Under various forms and combinations, the nobles of the first rank (as princes, counts, and lords), together with the warriors (consisting of *knights* bound to do service in war and at the court), which latter were not always considered as perfectly free, were distinguished from the peasants and common citizens, who were bound to perform the common laborious services. These latter, however, are not to be considered altogether in the light of bondmen. The further progress of these civil distinctions, and their relations to the people, took a very different course in the different countries of Europe. In England, Scotland, Spain, and to some extent in Italy, the higher nobility, attached to the titles of lords and barons, descended only to the eldest son. The younger sons, even in case of preferment in civil life (their rank in England is established by law), belong essentially to the mass of the people. They engage in various kinds of business; they not only devote themselves to the clerical profession, and to military service, but become lawyers, merchants, proprietors of manufactures, &c. In England, hereditary nobility, including various classes of titles, e. g. those of dukes, marquises, earls, viscounts, and barons, (see *England*) is rather more personal. There are also feudal tenures merely titular, to which certain privileges and honours are attached, the free exercise of which is allowed to every proprietor; but the proprietor does not belong to the nobility, unless he is raised to this distinction by a special patent. In Spain and Italy, on the other hand, the same rank (that of the *titulados*, princes, dukes, marquises, and counts) depends, in a greater measure, upon property; for these titles, though sometimes conferred by the monarchs, are mostly connected with estates, and often attached to very small fiefs. Hence the multitude of counts in Upper Italy, the *conti di terra ferma* of Venice in former times. The distinguished Spanish families collect, in this manner, a great number of such titles, which constitute an object of their pride. They are called *gorras* (caps), and sometimes amount to four or five hundred. In France, this rank is common to all the members of the noble family. The rights of the peerage, and the feudal estates, however, descended, even before the revolution, only to the eldest son; and the younger sons were obliged to seek their fortune either in the army or the church. Every meaner employment, even mercantile business, was followed by the loss of nobility. The nobility of England has never risen to sovereignty, except that some provinces which formerly were domains of princes of the royal family (as Lancaster, Cornwall), and some viscounties (Durham, Chester, the isle of Ely, and especially the isle of Man, belonging to the duke of Athol), enjoyed, as *counties palatine*, so called, subordinate rights of government. The sovereignty connected with the ancient fiefs of the French princes—as the dukedoms of Normandy, Bretagne, Guienne, Burgundy; the counties of Toulouse, Champagne, Flanders; and the territories of Dauphiné, Provence, Franche-Comté, Venaissin, &c.—took its rise at a very early period, and had already become complete, when Hugh Capet ascended the throne. But France was fortunate enough to unite, by degrees, all these extensive fiefs with the crown, so that only a few small sovereignties (as the princedoms of Bouillon, Dombes, Orange, Avignon, and Venaissin, &c.) and have maintained themselves as such to more recent periods. In the age of Louis IX., appeals from the courts of the barons to the supreme courts of the king and parliaments were introduced, and were followed by a gradual extension of the king's authority over the territories of the barons; and finally, under the reign of Louis XIII., the power of the grandees was completely destroyed by Richelieu. The course which the nobility took in Germany was different. Here the ancient dukes of Saxony, Bavaria, Franconia, Suabia, Lotharingia, and, next to them, the margraves in the east and north of the German empire, obtained, at the same time as in France, the rights of sovereignty; and the title of *count* became partly hereditary, partly an appendage to the ecclesiastical establishments. The emperors succeeded in annihilating these ancient principalities, but profited little by it, for new sovereignties soon took the places of the ancient dukedoms, inferior in size and power, but equal to them in the extent of their rights and privileges. The greater number of the courts assumed the rights of sovereignty, and a vast number of ruling families thus sprang up in Germany, and formed a ruling order of nobility, in which not only the rank, but also the property, was hereditary, and became the common inheritance of the whole family. One principle in this system is peculiar to the German states, which was never established in any other country of Europe, namely, that the mother must be of equal rank with the father, in order to place her children in the full possession of their father's rights. Many even princely families, as Baden, Anhalt, &c., have transgressed this principle; but others adhered to it with great strictness. The same principle has been extended to the lower class of the German nobility.

In their case, however, it affects only the enjoyment of certain privileges common to the whole body of nobility—privileges by which the German nobility is more strictly distinguished from the middle classes of freemen than that of any other country. In the rest of Europe, not even the highest class of nobility recognises this principle. In France, the royal alone affords no example of a marriage contracted with persons of a lower rank, though the law would not have interfered. The legitimated branches of the royal family, the offspring of mistresses, the princes of Vendome, Verneuil, Vermandois, Maine, Toulouse, Penthievre, &c., which are now extinct, Louis XIV. did not hesitate, in his will, to recognise as capable of succession to the French throne, in spite of their descent, not merely from parents of unequal rank, but even from an illegitimate connexion; and the same right could never have been contested in regard to children of a legitimate connexion between parents of unequal rank. In the noble families of France, the rank of the mother was likewise of no consequence; the whole importance of the family rested on the lineage of the father. The same is the case in England, where intermarriages between the families of respectable citizens (merchants, bankers, brewers, advocates, &c.) and the highest nobility are not uncommon. Thus the wife of the celebrated Whitbread, speaker in parliament, and citizen and brewer of London, was a sister of earl Grey. The first wife of king James II. was the daughter of chancellor Hyde, who afterwards became earl of Clarendon; and her daughters, Mary and Anne, succeeded to the throne of England. Similar examples may be found in other countries. In Germany alone, the interests of the kindred of princes, as well as the exclusive claims of the nobility to the chapters and prebends of the ecclesiastical orders, have produced those rigid principles above-mentioned. Germany is likewise the only country which affords an example of a select nobility composed of reigning families and princes, who, besides the right of sovereignty over their own territories, had a part in the government of the empire, by their seat and vote in the diet, or, at least, a share in the collective vote of the prelates, or of the four bodies of counts. For some rights of sovereignty belonged also to the knights of the empire, who did not belong to the select nobility. The limits of this select nobility were extremely uncertain and contested, though very important to be settled, on account of the restrictions on the marriage of its members. The rank of the select nobility was partly personal, partly hereditary. The former was attached to ecclesiastical princes, bishops, and abbots, many of whom were, at the same time, actual sovereigns; but many possessed only the dignity of princes of the empire, without the rights of sovereignty. In most of these ecclesiastical principalities, the German nobility had excluded untitled men of learning and talent, against the will of the pope, and his express order, promulgated in the treaty of Westphalia (article v., section 17). The highest degree of hereditary nobility was peculiar to the families of the princes and counts of the empire, and confined to Germany. It is true many French, Italian, Spanish, and English families had the title of princes, dukes, and marquises (English dukes and marquises are also called *princes* in official documents), but the German princes considered few of them as their equals. To this class belong, in France, those six foreign families which enjoyed at the French courts the rights of *princes étrangers*, on account of their relationship with sovereign houses, or on account of their descent from former sovereigns of Brétagne and Aquitania. These families in France were those of Lotharingia, Savoy, Grimaldi (princes of Monaco), Rohan, Latour d'Auvergne (dukes and princes of Bouillon). Some Polish families belong also to this class, as the Radzivills, Czartoriskis, &c. In Sweden and Denmark, a select nobility of this kind has never existed. Though many German families of this rank have lost their sovereignty, yet the act of the German confederation has conceded to them the highest rank of nobility, equal to that of the sovereign houses. There was still a strict distinction in Germany between the ancient princes, who had risen to this dignity before 1580, and those of a more recent date. The more, however, the power of the German principalities increased, the more the importance of the nobility decreased. On this account, a society was formed in 1815, called the *chain of nobility*, for the purpose of restoring and promoting the interests of the nobles; but it met with little success. The British nobility, composing the house of lords, consists of five ranks: duke, marquis, earl, viscount, baron. The nobility in France is designated by the title *peres de France*; for both the ancient and modern titles of nobility, as *prince*, *duc*, *marquis*, *comte*, *vicomte*, *baron*, occur also without *peerage*. The lower nobility (*gentry* in Britain), considered as a separate rank, is of later origin. In Britain, every one belongs to it who does not engage in any mean employment, and, for this reason, is entitled to the appellation *esquire*, and a coat of arms. In Spain, any one may call himself *hidalgo* whose ancestors have not been engaged in mean employments; and in France this dignity was connected with many even insignificant offices, and, of course, very easily obtained. Great importance was, however, attached to ancient nobility, that is, nobility which could not be traced to its origin. Nobility of 400 years' duration was requisite for a presentation at court. The *Storthing* of Norway, as was mentioned above, abolished nobility in 1821. The Russian nobility, though its origin is not directly derived from the German tribes, has appropriated to itself all its degrees and titles. (See *Russia*). In Livonia and Esthonia, the ancient nobility, founded on conquest, is, as yet, in existence. The dominion of the Russian nobility over their peasants gives a political importance to this rank, though destitute of the rights of sovereignty.

Nobility was very early conferred by patent. As soon as the nobles had assumed the character of a distinct rank in the state, the monarchs also availed themselves of their right of conferring degrees of nobility, and insisted upon the principle that, in a monarchy, no privilege could be more ancient, or could have any other origin, than the prerogative of the monarch himself. Philip III., therefore, first began (1270) to grant charters of nobility in France, and Germany soon followed his example. The degrees of the lower nobility in Germany were, 1. The title *Von*; 2. *Edler von*; 3. *Ritter*; 4. *Bannerherr*; 5. *Freyherr*; 6. *Count*. Their privileges were originally of little importance; but, in several countries, they were enlarged to a considerable extent by law, as well as by custom and practice. They enjoyed immunity from taxes, and an exclusive right to the highest public offices, especially in the army. The most important of these privileges have, in modern times, either been limited or entirely abolished, because they were inconsistent with justice, and an obstacle to the prosperity of the state. The French revolution first deprived the nobles of that country of their oppressive privileges and exclusive rights, as that of jurisdiction, &c. (decree of August 4, 1789); and, after the overthrow of the feudal system by a number of laws, the decree of June 19, 1790, abolished hereditary rank entirely. The senate under Napoleon (August 14, 1806), and the decree of March 1, 1808, gave rise to a new hereditary nobility, with the titles of princes, dukes, counts, barons, and chevaliers, which descended, however, only to the eldest son. After the restoration of the Bourbons, the ancient nobility reclaimed their former rights and privileges.[*] Thus nobility has again been generally introduced into all the states of Europe except Norway, where the *Storthing* has abolished it by the three successive decrees of 1815, 1818, and 1821. The king, indeed, was unable to prevent it; but, on the principle of conforming the social system of his country to the civil organization of the neighbouring states, he proposed the establishment of a new hereditary nobility, which should be conferred by the king on persons who had benefited their country, and which should descend to the eldest son. But the *Storthing* rejected the proposal, because it was against the twenty-fifth article of the constitution of 1814, which declares that no hereditary privileges, personal or real, can be conferred on any native of Norway.

NOBLE; an ancient money of account, containing six shillings and eightpence.

NODE; the point where the orbit of a planet intersects the ecliptic.

NOLA; a town near Naples, in Lavora, said to have been built by the Etrurians before Rome, thirteen miles east of Naples; lon. 14° 20′ E.; lat. 40° 53′ N.; population, 8850; bishop's see. It was once a Roman colony, rich and flourishing, and is yet a handsome town. The silk spun in the neighbourhood is much esteemed. Bells are said to have been first made here, and here Augustus died. Near it Hannibal was twice defeated by Marcellus.

NOLLEKINS, JOSEPH, an English sculptor, born in London in 1737, was the son of a painter, was placed early under Scheemakers, and, in 1759 and 1760, gained premiums from the society of arts. He subsequently repaired to Rome, where he had the honour of receiving a gold medal from the Roman academy of painting and sculpture. He remained nine years at Rome, during which time he executed the busts of many Englishmen of distinction, and returned in 1770. Nollekins was chiefly distinguished by his careful and accurate imitation of nature, and by the absence of any peculiarity of manner. His Venus with the Sandal is esteemed his principal ideal production; but his professional reputation rests principally upon his busts. He died, April 23, 1823.—See Smith's *Nollekins and his Times* (2 vols., 8vo, 1828).

NOLLE PROSEQUI is a stoppage of proceedings by a plaintiff, and is an acknowledgment that he has no cause of action.

NOLLET, JOHN ANTOINE; a distinguished cultivator of natural philosophy and natural history, born at Pimbré, near Noyon, 1700, of poor parents. He received his first instruction at Clermont and Beauvais, and then went to Paris, where he became intimate with Réaumur, Dufay, Duhamel, and Jussieu. In 1738, count Maurepas first established a professorship of experimental physics for Nollet, who was also made member of several scientific societies. To extend his acquaintance with science, he went to England and Italy. In 1744, he was appointed to instruct the dauphin in experimental physics at Versailles. He employed himself particularly in experiments on electricity. Nollet died at Paris, 1770. His works are principally in the Memoirs of the Academy of Sciences at Paris. His treatise on the Hearing of Fish is particularly esteemed. He also wrote *Leçons de Physique expérimentale* (Amsterdam, 1754, 4 vols., 12mo), and *L'Art des Expériences* (Amsterdam, 1770, 3 vols., 12mo).

NOMADS (from the *Greek*); tribes without fixed habitations, generally engaged in the tending and raising of cattle, and changing their abode as inclination prompts. But landed property and agriculture are the chief supports of a permanent civilization, so that the nomads are far behind agriculturists in this respect. Nomadic tribes are seldom found to quit their wandering life, until they are compelled to do so by being surrounded by tribes in settled habitations, or unless they can make themselves masters of the settlements of a civilized nation. But this change commonly takes place by degrees. Some of the greatest revolutions in history have been effected by these wandering tribes. North Africa, the interior of North and South America, and the northern and middle parts of Asia, are still occupied by nomads. Different tribes, however, possess different degrees of civilization. Some are little better than bands of robbers.

NOMENCLATOR was, with the Romans, a servant, who, at great festivals, informed the guests of the name and ingredients of the dishes—not a bad fashion. There were more important nomenclators, whose business it was to attend candidates for public offices, and suggest to them the names of the persons whom they met, that they might be able to address them familiarly, and thus obtain popularity. Those Romans who possessed very many slaves, had one nomenclator, who knew the names of all of them.

NOMINALISTS, in dialectics. A clear view of nominalism depends upon a proper understanding of the scholastic philosophy. Charlemagne had established schools (*scholæ*) for the education and formation of clergymen, in which the (so called) seven liberal arts (the *trivium* and *quadrivium*) were taught. As in those times research and speculation were not allowed to go beyond the dogmas of the church, philosophy, or rather dialectics, applied itself only to theology. It was at first enthralled by the fetters of the schools, and, at a later period, by the fear of the imputation of heresy. Thus originated, in the limited field to which the human mind was confined, a system of dialectics, which sought satisfaction in logical subtleties and empty forms, but which, however, tended much to exercise the acuteness of the European nations. A great schism in scholastic philosophy was caused by (the so called) *nominalism*, the founder of which was John Roscellin, canon of Compiègne, who maintained, among other doctrines then considered heresies, that all general ideas are mere words, *nomina*, names (*flatus vocis*). The *Realists* (from *res*, thing), on the other hand, maintained, that general ideas are not formed by the understanding, but are founded in reality in the objects themselves; are, in fact, the essence of the things themselves. The doctrine of Roscellin was condemned at Soissons, 1092, and the realists, who disagreed among themselves only upon some unimportant points, became the predominating school. But in the beginning of the fourteenth century, the dispute of the nominalists and the realists was revived by the English Franciscan William of Occam, a scholar of the famous Duns Scotus (who taught at Paris); in such a way that the nominalists were at length victorious. The philosophical adversaries gave vent to their feelings, in the spirit of the time, by blows. (See D'Israeli's *Curiosities of Literature*.) Among the supporters of nominalism should be mentioned the celebrated John Buridan of Bethune (1350), Robert Holcot (died 1349), Gregory of Rimini (died 1358), Henry of Oyta, Henry of Hessia (died 1397), Nicholas Oresmius (died 1382), Matthew of Cracow (died 1410), Gabriel Biel (died 1495). The nominalists were. indeed, often persecuted (in Paris, 1339, 1340, 1409, 1473); but they gradually gained the ascendency in the universities of France as well as in Germany. They are memorable in the history of philosophy in the middle ages, since from them proceeded a spirit of more liberal investigation, independent of dogmatic theology—a spirit which opened the way to the higher philosophy of subsequent times.

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[*] In a note near the end of chapter ix. of the abbé de Pradt's *L'Europe après le Congrès d'Aix-la-Chapelle*, it is stated that, "before the revolution, the number of noble families in France did not exceed 17,500. Reckoning five individuals to a family, there might have been about 90,000 nobles. The disasters of the revolution must have reduced them to less than 10,000."

NON, JEAN CLAUDE RICHARD DE SAINT, member of the academy of painting and sculpture at Paris, born 1727, died at Paris, November 25, 1791. He is known for his *Voyage pittoresque de Naples et de Sicile* (1782—86, 5 vols., fol.), which is principally esteemed for the (417) plates. He himself etched with much ability. Besides the engravings published with his travels, he also published a number of engravings from antiques and works of Le Prince, Boucher, and Fragonard. See *Denon*.

NON, or NUN. See *Niger*.

NON-ACTIVITY, PRINCIPLE OF, in the law of nations. See *Neutrality*.

NON COMPOS MENTIS. A distinction is made between an idiot and a person *non compos mentis*, the former being constitutionally destitute of reason, the latter deprived of that with which he was naturally endowed. But, to many purposes, the law makes no distinction between the two. It is a general maxim of the law that a person not possessed of reason cannot bind himself by contract, for he is incapable of giving that consent which is the foundation of all obligation. And it makes no difference, in this respect, whether the incapacity arises from a temporary mental alienation or a natural idiocy, except that in the latter case the act of an idiot is absolutely void, whereas that of a lunatic is only voidable at the election of the insane person or his guardian. A maxim was formerly supposed to have crept into the English law, which, in some degree, deprived persons, subject to temporary insanity, of the advantage of the doctrine, that they could not bind themselves by contract while in this state. This maxim was, that no one should be permitted to stultify himself, that is, to say that when he made such a deed or contract, he was bereft of his reason; for, said the judges, when a defendant made this plea, how can you remember that you were *non compos mentis?* Sir William Blackstone exposes the absurdity of this maxim, which was adopted, says Mr Fonblanque, "in defiance of natural justice and the universal practice of all civilized nations of the world." The maxim has been disregarded by English judges in some cases, and there is no recent evidence of its being now considered a part of the English law. Another very material consideration respecting persons destitute of reason, is the custody and treatment of them, which very naturally belong to their relatives; but it would be totally unsafe to leave them absolutely to determine when any one is insane. It very frequently happens, indeed, that the relatives or friends of a person deranged, restrain and confine him without any intervention of a magistrate, or any legal process for determining the fact of his mental alienation; and instances have occurred of the greatest cruelty and abuse practised under pretence that the subject of them was *non compos mentis;* and the occurrence has been made the foundation of incidents in fictitious narratives. Such abuses do not take place, however, from a want of provision in the laws to protect the individual from them; for any person under arrest and detention for any crime whatever, has a right to be brought before a magistrate on a writ of *habeas corpus*, that the cause of his restraint may be inquired into. This process affords an immediate remedy, if any one takes sufficient interest in the welfare of the person detained to make application for it in his behalf. Besides this remedy, the laws of some states provide a precautionary process, whereby the fact of mental incapacity or alienation is previously inquired into before personal restraint is permitted, and, in general, such previous proceedings must be had in order to take from any person the management of his property.

NON-CONDUCTOR. See *Caloric* and *Electricity*.

NON-CONFORMISTS; those who refuse to join the established church in England. The name was at first particularly applied to those clergymen who were ejected from their livings by the act of uniformity in 1662. Their number was about 2000. The act required that every clergyman should be reordained, if he had before received episcopal ordination; should declare his assent to every thing contained in the book of Common Prayer; take the oath of canonical obedience; abjure the solemn league and covenant; and renounce the principle of taking arms against the king. All the royal promises of toleration and of indulgence to tender consciences were thus eluded and broken. The Presbyterians, Independents, &c., refused to conform, and were exposed to the most cruel persecutions. By the five mile act (1665), it was enacted that no dissenting teacher, who would not take the oath above-mentioned, should approach within five miles of any corporation, or of any place where he had preached after the act of oblivion; this act was intended to deprive them of all means of subsistence. Other acts of a similar character were passed; but, on the accession of William III., these penalties and disabilities were removed by the toleration act. Some of these oppressive provisions were revived during the reign of queen Anne, but were finally repealed in 1718. The name *Nonconformists*, in consequence of this change of circumstances, gave way to that of *Dissenters*. The chief dissenting sects are the presbyterians, independents, baptists, quakers, methodists, and unitarians, the catholics not being commonly comprehended under this term. (See *Catholic Emancipation*). The statute 53d Geo. III., c. 60, repeals so much of former acts as excepted persons denying the Trinity from the benefit of the toleration act, or imposed penalties on such persons. Protestant dissenters were thus at least practically delivered from penal restrictions in the exercise of their religion. The repeal of the corporation and test acts in 1828, removed the civil disabilities under which they had previously been placed. The protestant dissenters are estimated to be at least one-half of the population. See *Ecclesiastical Establishments*, *Puritans*.

NONES. See *Calendar*.

NON-JURORS. See *Jacobites*.

NONNUS; a later Greek poet, who lived, according to some, in the beginning, according to others, at the end, of the fifth century. He was born at Panopolis, in Egypt. He is the author of a poem entitled *Dionysiaca*, in forty-eight books, in which the expedition of Bacchus (Dionysus) to India is described. The style is inflated and prolix; the descriptions go too much into detail; the epithets are often unnecessarily accumulated and far-fetched; but the versification is good, and the tone is animated. Nonnus also wrote a paraphrase, in verse, of the gospel of St John, which may serve as a commentary, being very perspicuous, though not very poetical.

NONOTE, CLAUDE FRANÇOIS, a Jesuit, member of the academy of Besançon, born 1711, devoted himself principally to ecclesiastical history and to theology, and distinguished himself by his *Erreurs de Voltaire* (Avignon, 1762, 2 vols.; 5th edition, 1770, 12mo), which display much learning, and are written in a moderate tone. His purpose is to correct the errors and false statements, made partly from ignorance, partly from prejudice, by Voltaire, in his *Essai sur les Mœurs et l'Esprit des Nations*; but Voltaire overpowered him by his wit. Nonote died at Besançon, September 3, 1793.—See *Œuvres de l'Abbé Nonote* (Besançon, 1818, 7 vols.)

NONPAREIL; a sort of small printing type; as, for example, a b c.

NONSUIT. Where a person has commenced an action, and, at the trial, fails in his evidence to support it, or has brought a wrong action, he is nonsuited. There is this advantage attending a nonsuit, that the plaintiff, though he pays costs, may afterwards bring another action for the same cause, which he cannot do after a verdict against him.

NOOAHIVA, or NOOKAHWA. See *Washington Islands*.

NOOTKA SOUND; a bay of the North Pacific ocean, on the western coast of North America, discovered by captain Cook in 1778; lon. 126° 36′ W.; lat. 49° 35′ N. The sound embraces several islands. The water is from forty-seven to ninety fathoms deep. There are many anchoring places and good harbours. The shores are inhabited by Indians, and the land is hilly. The climate is much milder than in the same latitude on the eastern coast.

NORDENEI, or NORDERNEY; a small island on the coast of East Friesland, to which there is a foot-path from the continent at low tide. On the north-western side is a village, with 550 inhabitants (mostly seamen), and an establishment for sea-bathing, much resorted to during the summer. On the south-east side are downs from forty to eighty feet high.

NORDLINGEN, a town in Suabia, with 7560 inhabitants, which, in 1802, came into the possession of Bavaria. The Swedes were defeated here, Sept. 6, 1634, for the first time on German ground. (See *Thirty Years' War*). The battles of 1645, 1796, and 1800, have also contributed to make the place memorable.

NORE. See *Thames*.

NORFOLK, a maritime county of England, bounded north and east by the German ocean, south by Suffolk, and west by Cambridgeshire and the Washes. Its extreme length is fifty-nine miles; and its breadth, from north to south, thirty-eight. Prior to the Roman invasion, it was inhabited by the warlike *Iceni*, celebrated by Tacitus on account of their insurrection against the Roman government, under their brave but unfortunate queen Boadicea. It afterwards formed the northern part of the kingdom of East Anglia, whence its name Nord-folke. The county contains one city, Norwich, and thirty-two market-towns, of which the principal are, Yarmouth, Thetford, Lynn Regis, Cromer, Dyss, and Wymondham.

Game of various kinds is abundant throughout the county, on some manors the pheasants being so numerous as to detract considerably from the profits of the farmer: on the sandy heaths are found great multitudes of rabbits. The air in the marsh districts is cold and damp, and the climate is reckoned unhealthy, agues having been here so prevalent, as to have given rise to the proverbial expression of being "arrested by the bailiff of Marshland," to denote a fit of the ague. Where the soil is sandy, the atmosphere is salubrious, mild, and agreeable. The products of the county are various, according to the soil and situation. The lighter arable lands afford good crops of barley, much of which is made into malt and exported. Wheat is much cultivated in the stronger soils; but the growth of turnips forms the distinguishing characteristic of Norfolk husbandry, this useful root having been introduced from Hanover in the reign of George I. by lord Townshend; and it is more generally raised here, and in higher perfection, than probably in any other part of the kingdom. Much buckwheat is likewise grown on the light lands, and is used as food for swine and poultry; mustard is cultivated as a regular crop on the western border of the county; flax around Downham; hemp in the neighbourhood of Old Buckenham; saffron is produced in several parts of Norfolk; and besides these, may be reckoned among the agricultural products, peas, beans, and vetches or tares; cole-seed, clover, and other artificial grasses; succory, cabbages, mangel-wurzel, carrots, and potatoes, of which last the culture is increasing as a regular field-crop. The fenny parts of the county furnish abundant pasture for milch kine, which produces great quantities of butter, sent to London for sale under the name of Cambridge butter. Scottish and other cattle are fattened for the supply of the metropolitan and nearer markets; and sheep are fed here, of a hardy, active, and rather small breed, much esteemed for the excellence of the mutton. Population of the county in 1831, 390,054.

NORFOLK, Duke of. See *Howard, Thomas*.

NORIA. The machine used in Spain under the name of *noria*, consists of revolving buckets, like the Persian wheel. But instead of a single wheel, two drums or trundles are employed, and the buckets are attached to ropes or chains passing round them. In Spain, earthen pitchers are said to be used, but in other countries wooden buckets are employed, like those of an overshot wheel.

NORICUM was, among the Romans, that part of the south of Germany which is situated between the Save, the lake Pelso, Rhætia, Vindelicia, and the Danube; but its boundaries were not the same at all times. The Celts inhabited this country.

NORMAL YEAR, in German history; the year 1624, because, in the peace of Westphalia, the state of the ecclesiastical rights and privileges, as they existed on January 1, 1624, was taken as the standard for the regulation of the ecclesiastical relations between the three sects in Germany.

NORMANDY; an ancient province in the north of France, bounded N. by the channel, E. by Picardy and Isle de France, S. by Maine, and W. by Brittany. It was divided into Upper and Lower Normany; Rouen was the capital of the former, Caen of the latter. It is now divided into five departments (q. v.), containing a population of 2,000,000. It is one of the richest and most fertile parts of France. The Norman is distinguished for intelligence and shrewdness. It derived its name from the Normans, who took possession of it in 912, and became annexed to England, through the accession of William, duke of Normandy, to the English throne. (See *Normans*.) Philip Augustus wrested it from John, and united it to France, in 1203. It was afterwards several times invaded by the English, but finally recovered by the French, in 1450.

NORMANN EHRENFELS, Charles Frederic Lebrecht, count of, born at Stuttgard, in 1784, died at Missolonghi, while in the Greek service, in 1822. See *Greece, Revolution of*.

NORMANS, or NORTHMEN; the inhabitants of the ancient Scandinavia, or Norway, Sweden, and Denmark. This name was given to them in the Netherlands, in Germany, and France; in Britain they were called *Danes*. They were fierce and warlike tribes, who made piratical expeditions to all parts of the European seas, plundering by land and by sea, and often overrunning large tracts of country, in which they practised every enormity. "They had scarcely any inducement," says Mackintosh

(*Hist. of Eng.*), "to spare countries which they visited only to plunder, and where they did not hope to dwell; they were less than others liable to retaliation, and they had neither kindred, nor family, nor home. They were, perhaps, the only barbarians who applied their highest title of magistracy to denote the leaders of piratical squadrons, whom they termed *vikingr*, or *sea kings*. Not contented with their native and habitual ferocity, some of them (called *Berserker*) sought to surpass their companions by working themselves into horrible and temporary insanity." The poverty of their country compelled them to adopt this means of subsistence, and their religion inspired them with a love for daring enterprises, since it taught them that warriors, fallen in battle, were admitted to the joys of *Valhalla*, the northern paradise. (See *Northern Mythology*.) They began their piratical excursions in the first part of the ninth century, and soon covered the sea with their boats, and ravaged the coasts of England, Germany, Friesland, Flanders, and France. Under the feeble reigns of Charles the Bald and Charles the Fat, they ascended the rivers to the very heart of France, and plundered Paris itself. It became necessary to purchase their retreat with gold. Their incursions into France were afterwards renewed, and Charles the Simple was obliged (912) to cede to them a part of Neustria (q. v.), which was afterwards called, from them, *Normandy*, and to give his daughter in marriage to Rollo, their chief. Rollo embraced the Christian religion, was baptized under the name of Robert, and became the first duke of Normandy, and a vassal of the king of France. His followers received the religion of their leader, and abandoned their roving and piratical habits. (See *France*, divisions *History*, *Language*, and *Literature*.) Britain was, for about two centuries, desolated by the Danes, as they were there called. Egbert (q. v.), in the beginning of the ninth century, had no sooner made some approaches towards a regular government, and the establishment of tranquillity, than the "Scandinavian heathens," as the Saxons termed them, made their appearance. Alfred (871—901) finally delivered the country from the invaders, after they had subdued the whole land except the "isle of the nobles," into which the king had retreated with a few nobles. But the relief was only temporary: they returned, under his successors, in greater force, obtained possession of the northern and eastern part of the country, and in the beginning of the eleventh century, three Scandinavian princes (Canute, Harold, and Hardicanute) ruled over all England for the space of about twenty-five years. (See *Britain*.) The Saxon line was then restored; but, in 1066, William, duke of Normandy, obtained the English throne. (See *William I. the Conqueror*.) This conquest, as it is commonly called, had a most important influence on the Saxon manners, language, and constitution, which had hitherto escaped with little change, and is therefore one of the most important epochs in English history.—See Thierry's valuable work, *Histoire de la Conquête de l'Angleterre par les Normands, de ses Causes et de ses Suites jusqu'à nos Jours* (Paris, 1825), and Hallam's *Middle Ages*, ch. viii. The Normans also established a new kingdom in Naples, in 1016. (See *Sicilies, the Two*.) According to the Russian Historian Nestor, the Warangians, or Varangians, who founded a kingdom in Russia, under Ruric (862), were Normans. The foreign expeditions of the Northmen gradually diminished their numbers and strength at home, and rendered them less formidable.—See Depping's *Histoire des Expéditions maritimes des Normands et de leurs Etablissements en France au 10me Siècle* (Paris, 1826); Wheaton's *History of the Northmen* (1831).

NORTE, DEL, or RIO BRAVO DEL NORTE, a river of Mexico, which rises in the Rocky mountains, near the sources of the Arkansas, about lat. 41° N., runs S.S.E., and empties itself into the gulf of Mexico; lon. 96° 40′ W.; lat. 26° N. It serves but little the purposes of navigation, owing to the sand bars in the flat country, and the mountains in the upper part. It is, however, navigable for boats and canoes in various parts of its course. Length, about 2,000 miles.

NORTH; a department of France. See *Department*.

NORTH, Francis, baron Guildford, lord keeper of the great seal under Charles II. and James II., was born about 1640, and became a student of St John's college, Cambridge, after which he entered at the Middle Temple, and was regularly called to the bar. He gradually made his way to the first dignities of his profession, rather by his prudence and dexterity than by extraordinary talents. He was made solicitor-general in 1671, when he received the honour of knighthood; in 1673, he was made attorney-general; the next year, chief-justice of the common-pleas; and, in 1683, lord keeper, when he was raised to the peerage. He died in 1685. Besides some papers in the Philosophical Transactions, lord Guildford was the author of a Philosophical Essay on Music, which contributed to the improvement of the art.

2. Sir *Dudley North*, brother of the lord keeper, engaged in commercial pursuits, and became an eminent Turkey merchant. He was afterwards one of the lords of the treasury in the reign of Charles II. He wrote Observations on the Manners, Customs, and Jurisprudence of the Turks. He died in 1691.

3. Doctor *John North*, another brother, was born in 1645, and educated at Jesus college, Cambridge, where he obtained a fellowship. In 1672, he was chosen professor of Greek, and the following year he was created D. D. Doctor North was an admirer of Plato, a selection of whose dialogues, including Crito, Phædo, with the *Apologia Socratis*, he published in Greek and Latin (1673, 8vo). His death took place in 1683.

4. *Roger North*, a younger brother of the same family, attorney-general under James II., principally merits notice as the historian of his family. His life of the lord keeper (lord Guildford, 1734, 4to) was reprinted in 1808 (2 vols., 8vo); and his lives of Sir Dudley and doctor John North (1744, 4to) appeared in a new edition with the preceding (3 vols., 8vo, 1826).

NORTH, Frederic, earl of Guildford, an English statesman of the same family with the foregoing, was the eldest son of Francis, second earl of Guildford, and was born in 1732. He received his education at Eton school and Trinity college, Oxford, after which he passed some time at Leipsic. Returning to England, he obtained a seat in the house of commons, and, in 1759, was appointed a commissioner of the treasury. On the resignation of lord Bute, in 1763, he was made head of that board, which post he held till 1765; and the next year he was made joint receiver and paymaster of the forces. At length, in 1767, he became chancellor of the exchequer, and, in 1770, first lord of the treasury. His administration lasted till 1782, during a period of peculiar difficulty and danger. Having accepted of office at a time when the court party had become unpopular, on account of the secret influence supposed to be possessed by lord Bute, something of that unpopularity attached to the whole course of lord North's ministry. But this was greatly augmented by the contest with the North American

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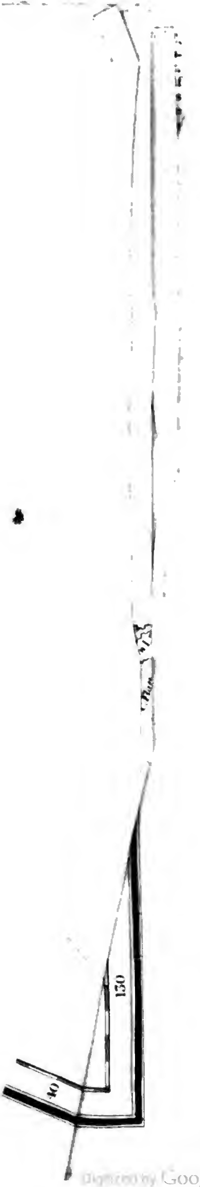

colonies, which ended in the loss of that part of the British empire, after the expenditure of a vast deal of the national wealth, and the sacrifice of multitudes of lives. For this disastrous measure of subjugating America, the premier appears to have been a sincere advocate; and, in defending his proceedings against the attacks of Mr Fox and his party, in parliament, he evinced a degree of political skill and resolution which would have done honour to a better cause. After his dismission from office, a league was formed between his lordship and the Whigs which led to the famous coalition ministry; but this heterogeneous administration lasted only a few months, after which lord North held no responsible station in the state. He succeeded to the earldom of Guildford in 1790, on the death of his father, and died in 1792. Lord North was much esteemed in private life, and was distinguished for urbanity of manners, and a turn for repartee. He was afflicted with blindness several years before his death, and his political antagonist, colonel Barré, was subject to the same misfortune. Replying to some observations of the colonel, in the house of commons, lord North said, "Notwithstanding the hostility which the honourable gentleman opposite has shown towards me, yet I am certain that there are no two persons in the world who would be more happy to see each other."

NORTH AMERICA; that part of the continent of America which lies north of lat. 8° 46′ N. The whole of the northern coast has not yet been visited; but from 108° W. lon. to Beering's straits, the whole of which space has been explored, with the exception of 160 miles, the most northern point known is in 71°23′ 39″; and there is little reason to doubt that the portion of the coast to the east of 108° (about twenty degrees of longitude), yet unexamined, preserves nearly the same parallel. Exclusive, therefore, of Greenland and the other islands belonging to America, in the Arctic ocean, and on the eastern and western coasts, the main land of North America extends from about 8° 46′ to 72° N. lat., and from about 55° 30′ to 168° W. lon. The greatest breadth is in about lat. 52°, where it is 74° of longitude, or 2500 geographical miles. Its greatest length from north to south is probably in the meridian of 100°, and is about 3300 miles. We have already given an account of the aborigines, the principal civil and natural divisions, and of the progress of discovery, under the heads *America*, *Americus*, *Columbus*, *Cabot*, *Louisiana*, *North Polar Expeditions*, &c., *Mexico*, *Central America*, *Indians*, *Indian Languages*, which it is unnecessary to repeat here.—See Murray's *North America* (2 vols., 8vo, 1829), and the *Memoir of Sebastian Cabot* (Philadelphia, 1831). From Hudson's straits the coasts tend south-easterly to cape Charles (Labrador), without presenting any remarkable indentation. From that point, they run south-westerly, with numerous considerable gulfs, such as the gulf of St Lawrence, the bay of Fundy, Massachusetts, Delaware, and Chesapeake bays, and Pamlico sound, to the southern point of Florida; whence, winding round the gulf of Mexico, and passing the peninsula of Yucatan, they border on the Caribbean sea. Crossing the isthmus of Darien, we find the western coast, lying on the Pacific, takes a general north-westerly direction, forms the gulf of California, and Nootka sound, and terminates at Beering's straits, which separate Asia and North America. A great mountainous chain covers the western part of North America with its numerous ridges. It consists of several ranges, running parallel with the coast, and extends, without interruption, south-south-east, from the northern coast to the west of Mackenzie's river, in lat. 70°, to the isthmus of Darien, where it joins the Andes. The northern part bears the name of *Rocky mountains*; the more southerly portion takes that of the *Mexican Cordilleras*. The Alleghany mountains, which run nearly parallel with the eastern course, are the only other considerable chain. The sources of the great rivers which rise in the central part of the continent, and flow into the Arctic and Atlantic oceans and the gulf of Mexico, do not appear to be separated by any mountainous country. The Missouri and the Mackenzie, the St Lawrence and the Mississippi, with the Saskashawan, which empties through lake Winnipeg into Hudson's bay, —all have their sources in the elevated region which lies to the east of the Rocky mountains. The Columbia is the only great river of North America, on their western declivity. The region in which these great streams rise is itself cold and sterile, forming, for several hundred miles to the west of the Rocky mountains, a sandy, barren, and uninhabitable desert. The great lakes of the interior are connected with the ocean by large rivers. Slave lake communicates with the Arctic ocean by Mackenzie's river, lake Winnipeg with Hudson's bay by the Nelson, and lakes Superior, Michigan, Huron, Erie, and Ontario with the Atlantic, through the St Lawrence. Too little is known of the greater part of the continent west of the meridian of 97° W., and north of 35°, and of the region north of the Canadas, to enable us to give a complete view of the physical geography of North America.

It was formerly thought that North America was less rich in precious metals than South America; but Humboldt has shown that the quantity produced in Mexico is superior to that of all the other Spanish possessions. Gold is found in Mexico in alluvium, and in primitive mountains, and in the United States. The Mexican silver mines are inexhaustible. Iron abounds in Russian America, Canada, and the United States. There are mines of copper; and that metal is found native on the southern coast of lake Superior, and in the northern parts of the continent, near the Coppermine river. The Labrador feldspar is celebrated. Anthracite and bituminous coal are abundant in the United States. Tin is produced in Mexico, and lead in great quantities in the United States. Salt is plenty in all parts of North America: it is obtained on the surface of the ground, in springs or in mines. Sulphur and all sorts of marble are found in different places.

The immense forests contain pines and firs of an extraordinary height, oaks of various species, walnut and chestnut trees, yew, ash, beech, birch, cypress, elm, willow, poplar, alder, lime, and other trees common to the other continent, but often of different species. Among those which are peculiar to America are the magnolia, the tulip-tree, the acacia, and many shrubs which bear beautiful flowers; the sassafras, the red mulberry, the wax myrtle, &c. In the forests of the warmer regions are the palms, cacao, mahogany, cocoa, and cotton trees. Besides these native productions, the orange and lemon trees, the coffee shrub, the sugar-cane and the indigo plant have been introduced by the Europeans. The banana, agave, potato, cactus or cochineal plant, &c., are also cultivated, and the odoriferous pod of the vanilla is gathered in the forests. All the fruits, cerealia, and useful plants of the old world, have been naturalized and cultivated with success, and North America can now furnish Europe with apples and flour. Maize and tobacco are natives. The northern regions are almost destitute of vegetation.

The vast prairies and savannas are peopled with immense herds of bisons, elks, moose, deer, antelopes, &c. Among the other animals are the beaver, the ermine, the marten, the otter, musk-rat, squirrel, &c. The porcupine is also found in North America.

The musk-ox, the reindeer, and the white bear are found only in the most northern regions. Carnivorous animals, such as the bear (the black bear and the grisly bear), the wolf, the cougar (panther), lynx, &c., are numerous in the unfrequented parts of the country. All the domestic animals of Europe—the horse, ox, sheep, goat, ass, dog, hog, and cat—have been introduced into America, and some of them have increased to such a degree that they form large herds in a wild state. Bees are numerous in the forests. North America harbours some dangerous reptiles, of which the rattlesnake is the most formidable. Mosquitoes are not less busy on the borders of the Arctic sea than on the shores of the Atlantic. The turkey is a native of America, and was first introduced into Europe in 1525. The mocking-bird is celebrated for its miraculous power of song; the humming-bird for its beauty and diminutive size; the wild pigeons darken the air. There are numerous other birds peculiar to this continent, and many, such as the eagle, owl, crow, hawk, swan, goose, duck, &c., which present specific differences from those of the same name in the eastern continent. The coasts and inland waters swarm with waterfowl. Alligators are found in the southern rivers; pikes, sturgeons, trout, eel, and salmon fill the waters. The great bank of Newfoundland and the neighbouring coasts abound in cod. The seal, walrus, &c., are found. For the natural history of North America, the reader may consult Godman's *Am. Nat. Hist. (Mastology)*, and Richardson's *Fauna Bor. Am.;* Wilson's and Audubon's *Ornithology;* Michaux's, Barton's, Nuttall's, Bigelow's botanical treatises; Cleaveland's *Mineralogy;* Silliman's *Am. Journal of Science*, &c.

The climate of North America is known to differ from that of the eastern continent, the quantity of heat in the same parallels of latitude being less in the former than in the latter. The difference, however, is not so great as was formerly supposed. It has been considered that there was a difference of temperature of several degrees between places under the same parallel on the Atlantic coast and the Mississippi Valley. This supposition, founded on the fact, that certain vegetable productions were found in more northern latitudes in the latter than in the former, has been shown to be erroneous by Humboldt. That distinguished philosopher explains the phenomenon by an examination of the form and direction of the valleys in these two regions. In the Atlantic region they are transverse, or run east and west, and therefore the propagation of plants northwardly was obstructed, while the great Mississippi Valley opens to the south, and therefore presents no obstacles to the migration of vegetables towards the north. The temperature on the western shores of North America seems to be considerably higher, however, than in the regions east of the Rocky mountains, and to correspond very nearly with that of the Atlantic countries of the eastern hemisphere. Further details on this subject will be found under the heads *Climate, Temperature*, and *Winds.*

The *Geology of North America*, or an account of the different rocks which constitute the material of this continent, and a description of the various modes of arrangement observed by them, is no less a subject of economical interest than of scientific curiosity, since to the existence of certain rock formations is due the fertility of a country in agriculture, and its richness in coal, salt, the useful metals, and other mineral productions necessary to human support; and from a knowledge of their relations, many interesting conclusions are derived relating to its antiquity and those great revolutions which it experienced prior to all historical records. Commencing this sketch with the northern extremity of the continent, where the severity of an arctic climate will scarcely allow of a wretched existence even to the hardy Esquimaux and Greenlander, the rock strata are in many places incapable of being observed, except for a short period during the year, while in others, they remain for ever concealed by those immense accumulations of ice, which, from their extent and perpetuity, seem almost entitled to the consideration of geological formations.* Notwithstanding the obstacles to geological research, however, much information, with regard to the formations of this remote region, has been collected through the voyages and travels of captains Franklin and Parry. The prevailing character of these countries is primitive, with occasional tracts of transition and secondary. An extensive coal formation occupies the banks of the Mackenzie river, where the beds of lignite are subject to spontaneous combustion. Bituminous coal, also, which some geologists have conceived belonged only to temperate latitudes, is found at Melville island and in Old Greenland.† A larger section may next be considered, comprehending Labrador, the two Canadas, and an extensive tract upon the northern side of the almost unbroken chain of lakes running from lake Superior to the Great Slave lake. Labrador, with its succession of lofty and naked hills, many of which attain the elevation of several thousand feet, may be considered as belonging almost exclusively to the earlier formations; while the country upon the north of the St Lawrence, though abounding in this class, also contains extensive transition and secondary deposits. The remainder of the present tract, from the outlet of lake Ontario to its distant western extremity, is remarkable for a continuous chain of primitive rocks, whose breadth, except in one place, where it was 240 miles, has not been determined.‡ In turning to view the geological features of another extensive portion of the American continent, our attention is arrested by the Rocky mountains, the most elevated land upon its surface, and which skirt its western coast from the isthmus of Panama to the Arctic ocean, and are, no doubt, a continuation of the Andes of the southern hemisphere. Although but partially explored, their primitive character is clearly established. Their eastern sides are covered, to the height of 200 or 300 feet, with a sand-stone consisting of the ruins of the granitic rocks upon which it reposes, whose disintegration was apparently effected by the gradual agency of an ancient ocean once occupying the immense plane or basin now extending eastward from the base of these mountains to the great chain of the Alleghanies. This vast basin, which has for its boundaries the Rocky mountains, the primitive chain bordering upon the great lakes before alluded to, the Alleghany mountains, and the gulf of Mexico, and which includes twenty-five degrees of latitude, and nearly double that number of degrees of longitude, is one great secondary formation. It is free from any considerable inequalities, though obviously not level; since its surface is drained by the three great streams, the Mackenzie, the St Lawrence, and the Mississippi. It abounds in all those peculiar aggregates which belong to this formation, as well as in their ordinary accompaniments—coal, gypsum and salt, lead and iron. Along its eastern base, so far as it has been explored in the Missouri country, it contains the remarkable sandy desert, whose width is between 500 and 600 miles.* An equal degree of simplicity characterises the structure of that portion of the North American continent, which still remains to be mentioned. The south-eastern boundary of the secondary basin just described, following the irregular base of the Alleghanies, from the Alabama river to fort Ann, near lake Champlain, is the north-western limit of an extensive tract of transition, which runs still farther northward, pursuing the eastern shore of lake Champlain, in a narrow belt, to Canada. It varies in width from twenty to upwards of 100 miles, and its stratification follows a north and south, or a north-east and south-west direction, with an inclination from the horizon of less than 45°. The mountains of this tract consist of long, parallel ridges, whose outline is almost one unbroken line, and whose sides decline in gentle slopes. In Pennsylvania, it embraces an extensive and invaluable deposit of anthracite coal, and one also in the state of Rhode island, which, though considerably removed from the present district, nevertheless, belongs to the same class of rocks. Iron and lead are likewise among the contents of this formation. To the transition upon its eastern side succeeds the great primitive country of the United States. Towards its southern extremity, in the Carolinas and Georgia, its width is above 150 miles; but as it advances northward through the Middle States, where the transition is widest, its breadth decreases: when it reaches the Highlands of New York, it begins to widen, and spreads over nearly the whole of New England, continuing into Canada and New Brunswick, probably to the mouth of the St Lawrence. To this primitive mass, also, belongs all the mountainous country between lake Champlain, the river St Lawrence, and lake Ontario, which is separated from the foregoing district by the narrow belt of transition occupying the eastern side of lake Champlain. The strata of this formation run from a north and south to a north-east and south-west direction, with a dip to the southward of more than 45°. Its greatest elevations are found in the White mountain range, where a few peaks attain a height of more than 6000 feet. The surface presented through the primitive country is that of circular and smoothly swelling masses, with rounded tops. It abounds, throughout its whole extent, and especially in New England, where it has been more carefully explored, with all those simple minerals, existing in similar formations in other countries. Its metallic deposits, which are mostly in the form of beds, are numerous and valuable; among which may be mentioned magnetic and hæmatetic iron ores, native gold, and copper pyrites. The eastern boundary of the primitive is a line commencing near Alabama river, and running northward through Augusta, upon the Savanna river, west of Camden, South Carolina, and near Aversboro, North Carolina, by Richmond, Philadelphia, and Trenton, and north of New York, pursuing the shores of the Atlantic. Within the primitive country thus defined, however, there exists, besides the transition tract of Rhode Island, a narrow strip of secondary, commencing at Northfield (Mass.) upon the Connecticut, and running through to the sea at New Haven, where it ends to recommence again upon the south side of the Hudson from whence it pursues a south-westerly course to the Rappahannock. It consists of the old red sand-stone, upon which repose, at several places, what are now regarded as the older volcanic rocks, amygdaloid and green-stone trap. The same formation also occurs farther north, in Nova Scotia. To complete our present sketch of the United States, we have only to notice what has, till lately, been denominated the *tertiary* formation of North America. It commences to the north in a clustre of islands situated south of cape Cod, and proceeding south, embraces Long Island, and, recommencing upon the continent in the northern part of New Jersey, covers the vast extent of country between the coast and the Alleghanies, and is finally terminated in the Mexican sea. North of the Roanoke, the tide penetrates completely across it to the primitive; but, farther south, it becomes more elevated. It consists of beds of sand, clay, and marl, which contain lignite, the remains of marine animals, and vast quantities of shells. The distinction of this extensive district into two formations—the upper secondary, or a formation contemporaneous with the super-medial order of Phillips and Conybeare, and the tertiary was first established by professor Vanuxem and doctor Morton. The former of these consists of marl, highly argillaceous, and containing greenish particles, analogous to those which are found in the green sand, or chalk, of Europe. Its prevalent colour is a dark green, sometimes rendered brown by per-oxide of iron. It abounds in the following genera of shells, viz. terebratula, gryphœa, exogyra, ammonites, baculites, and belemnites. It occupies a great part of the triangular peninsula of New Jersey, formed by the Atlantic, and the Delaware, and Raritan rivers, and extends across the state of Delaware from near Delaware city to the Chesapeake; appears again near Annapolis, in Maryland; at Lynch's creek, in South Carolina; at Cockspur island, in Georgia; and several places in Alabama and Florida. It has also been noticed in numerous other localities, when the tertiary and alluvial coverings have been removed by natural or artificial causes; and there are good grounds for the opinion, that beds of ferruginous sand extend nearly the whole length of the Atlantic frontier of the United States, south of Long island, though, for the most part, concealed by the different members of the tertiary class. The tertiary embraces the islands of Nantucket, Martha's Vineyard, Long Island in part, Manhattan island, together with a fractional part of the adjacent coast of New York and New England. It likewise forms the Neversink hills, in New Jersey, the southern part of the peninsula of Maryland, from whence it pursues a southern direction, forming an almost continuous superficial mass over the country between the Alleghanies and the coast, to the Mexican sea. It is composed of lime stones, with mixtures of clay or sand, or both, in variable proportions; of clay alone; of clay with sand, forming loam; of beds of gravel, or of buhr-stone. It is marked by littoral shells, analogous to those of the tertiary deposits of the Paris and English basins. The fossils of the tertiary are generally found within fifteen or twenty miles of the primitive, the intermediate space being filled with clays of various kinds. The highest point to which this formation rises, is about 250 feet. It is near the line of junction with the primitive on Savannah river. Over the surface of these formations is everywhere distributed alluvial gravel, containing large masses of granite and other primitive rocks; and in many places upon the coast it is covered with accumulations of alluvial sands.*

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* A single deposit of this abundant substance in Greenland, the Rheinwald glacier, is said to be four miles long, by two in breadth, and from several hundred to one thousand fathoms in height, consisting of pure ice, precipitated from the neighbouring mountains, and arranged in perpendicular columns, with a cavern opening into its eastern side of great extent.—*Travels and Voyages of Captains Parry, Ross, Franklin, and Belzoni*, (London. 1826, p. 263).

† Captain Parry's Third Voyage.

‡ Captain Franklin's Second Expedition.

Concerning the geology of the southern part of North America, we are still exceedingly deficient in information, the attention of travellers and mineralogists having been so much absorbed with the richness and variety of the metallic deposits of Mexico, as almost wholly to have overlooked its geological features. We cannot, perhaps, better perform this part of our task, than by presenting the reader the recent observations of Mr Maclure, published in the twentieth volume of the American Journal of Science and Arts. "From the great range of the Andes spring all the subordinate mountains, forming large plains or valleys, either near their summit, or on the planes of their descent, on either side, on which planes, below the level of the principal range, when not covered by the volcanic formations, the greatest part of the primitive crosses out to day. On the tops, both of the great range and the subordinate heights, appears to be placed the seat of the mines, principally in transition, though some are thought to be in primitive schist, or marble; from which it would appear that the summits of the mountains are principally transition. This supposition is countenanced by the small quantity of well-defined primitive found in the vicinity, and by its appearing at a lower level on both sides, which seems to indicate that the primitive is the formation of the whole range." Mr Maclure adds a very ingenious theory to explain the origin of mineral veins. He remarked that the veinstones, in a majority of instances, were secondary, proving that the veins must have been filled from the surface; for it is difficult to conceive how, in a primitive range, like the Andes, the secondary could be ejected from below. "It has been considered," he remarks, "as a geological fact, that metallic veins can have no dependence or connexion with volcanoes, yet our total ignorance of many original natural methods of operation ought to make us cautious in restricting nature to any exclusive mode of action. The primitive mountains in the north have iron in abundance, but the precious metals have as yet been rarely found; nor are there any modern volcanic rocks. The same may be observed in the north of Europe. Sweden and the north of Germany have rarely silver and gold, and no modern volcanic rocks; and, on the southern continent of America, there seems to be a proportion between the gigantic volcanic formation and the abundance of the precious metals. If we suppose the convulsions and earthquakes that might precede the eruption of lava to the surface to have rent and cracked the shell, so as to give space to the formation of these veins, and the precious metals, converted into vapour, to penetrate through chinks that would not permit lava to pass, this vapour, meeting with the secondary, that was filling the vein from the surface, might form a mixture such as we find in most of the veinstones."

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* Long's Expedition to the Rocky Mountains.

* Geology of the United States, by William Maclure (Phil., 1817), Journ. Acad. Nat. Sci. (Phil., vol. vi.), and American Journal (vol. vii. and xiii).

The foregoing sketch furnishes, among others, the following general facts and inferences:—1. The North Amercian resembles the European continent in the highly primitive character of its northern extremities; while it differs from it in the superior degree of continuity possessed by its great formations, as well as in the absence—leaving Mexico out of the question—of volcanic action, except such as is afforded by the partial deposits of secondary trap rocks. 2. The great ocean from which were precipitated the secondary sand stones, gypsum, and coal of the immense basin lying between the Alleghanies and the Rocky mountains, appears to have found its outlet by the St Lawrence and Mississippi rivers. 3. The upper secondary and tertiary formations formerly have probably been more extensive upon the Atlantic coast, and once connected the islands now forming its northern boundary with each other and the main land. 4. After the deposition of the secondary and tertiary formations, the land has been broken up by the action of sudden and violent currents, which have strewed its surface everywhere with boulders or rolled masses, and given to the coast its present insular and peninsular form. 5. The strata embrace all those metalliferous and earthy compounds existing in them in other quarters of the globe, and exhibit throughout the same general relations elsewhere observed, and, consequently, must have resulted from the operation of those great laws, under the control of which the solid mass of the earth has been formed.

NORTHAMPTON. The county town of Northamptonshire is situated on the northern bank of the river Nen, near the centre of the county, sixty-six miles N.W. by N. from London. It is noted for the manufacture of boots and shoes, which is carried on upon a very extensive scale; currying and dressing of leather, lace-making, and the manufacture of brass and iron-work are also largely prosecuted here. A considerable share of trade likewise arises from the constant passage of travellers by stage-coaches, from London to Liverpool, Manchester, &c.; and from the facilities afforded for the transfer of goods in consequence of the communication made between the river Nen and the Grand Junction Canal in 1815. Population in 1831, 15,351.

NORTHAMPTONSHIRE, an inland county of England, being nearly in the centre of the kingdom. Its length from N.E. to S.W. is about sixty-five miles, and its breadth about twenty-four miles. When the Romans invaded Britain, this part of the island was inhabited by a tribe of people called Coritani or Coitanni, and at a subsequent period it was included in the Roman province styled Flavia Cæsariensis. Under the heptarchy it belonged to the kingdom of Mercia. This county has been the scene of some remarkable events. In 1460 a battle took place near Northampton, between the partisans of the houses of Lancaster and York, in which the former were defeated, and Henry VI., who was present, was taken prisoner. At Fotheringay castle, near Oundle, Mary, queen of Scots, was executed, in 1586. And at Naseby, on the north-western border of the county, the army of Charles I. was totally routed by Fairfax and Cromwell, in 1645.

Northamptonshire is proverbially reckoned a fine and pleasant county, which opinion derives confirmation from the number of noblemen's and gentlemen's seats contained in it. Formerly a large portion of its surface was occupied by the forests of Rockingham, Salcey, and Whittlewood; and though a great part of the wood-land has been appropriated to the purposes of tillage or pasture, these forests are still included among the crown lands, consisting at present of about 18,000 acres. The chief towns in this county are, besides Northampton, the city of Peterborough, and the market-towns of Daventry, Wellingborough, Kettering, Thrapston, and Oundle. Population in 1831, 179,276.

NORTH CAROLINA. See *Carolina*.

NORTH CAROLINA UNIVERSITY. See *Chapel Hill*.

NORTHCOTE, JAMES; born in Plymouth, in 1746, where his father was a watchmaker, who designed him for his own business; but young Northcote, having a taste for the fine arts, and being flattered by praises bestowed on his early productions, pursued the practice of drawing and painting with so much assiduity, that doctor Mudge, a physician of that town, recommended him as a scholar to Sir Joshua Reynolds. He went to London in 1771, and became domesticated with that great artist. In 1776, he quitted him, and commenced business on his own account, with the full concurrence of his preceptor, and was eminently successful, his portraits having procured him both wealth and reputation. He wrote various papers in a work called the Artist. He also published Memoirs of Sir Joshua Reynolds, comprising Anecdotes of his Contemporaries (1813), and a Supplement (in 1815); and Memoirs of Titian (1830). He died in 1830.

NORTH-EASTERN PASSAGE. See *North Polar Expeditions*.

NORTHERN LIGHT. See *Aurora Borealis*.

NORTHERN LITERATURE. See *Scandinavian Literature*.

NORTHERN MYTHOLOGY. The interesting discoveries made by a more intimate acquaintance with the mythologies of the East Indies and Egypt, and a comparison of them with that of Greece (discoveries which, in the opinion of some scholars, prove the existence of a universal original religion—a pure deism, as some think—and, at all events, show the eternal thirst of man to explain the origin of nature, of himself, and, above all, of good and evil), justify us in assigning a separate place to the mythology of the North, which, even if its general traits were borrowed from Asia, must yet be considered as a distinct system. The northern mythology, in the systematic condition in which we now possess it, is the work of scalds, that is, of the ancient northern minstrels of Denmark, Norway, Sweden, and Iceland. Religion and civilization here, as is often the case, sprang from poetry: and here, also, as is so common, cosmogony (q. v.) was the basis of the religion—a cosmogony which, at the same time, proves the wild imagination of its authors, and the nature of the country where it originated. The following are its most important features: There were originally no heavens above nor earth below; but only a bottomless deep and a world of mist (*Nifheim*), in which flowed the fountain that strives to devour every thing (*Hwergelmer*). Twelve rivers, called *Eliwagar*, issue from this fountain. When they had flowed so far from their source that the liquid they contained had become hardened, they ceased flowing, and froze into ice, and one layer accumulating over another, the great deep was filled up. Southwards from the world of mist was the world of light, or fire (*Musspellheim*, *Mispelheim*). From the former proceeded every thing dark and cold; from the latter, whatever is warm and light; a warm wind blowing from the latter upon the ice (the rays of the sun from Mispelheim encountered the ice from Niflheim) melted it. The drops became living by the power of him who had sent the wind; and from them sprang Ymir, the ice-giant. Under Ymir's left arm grew a little man and woman, and one of his legs begot a son from the other. From them proceeded the ice-giants. From the mixture of ice and heat originated, also, the cow Audumbla, from whose dugs ran four streams of milk, by which Ymir was fed. The cow supported herself by licking the salt stones of the ice. As she was thus one day licking the stones, lo, in the evening, human hair grew out of them; on the next day appeared a head; and, on the third, an entire man, called *Bure*. His son was Bor, who married Belsta, daughter of the giant Mountain-Gate. By her he had three sons, Odin, Wile, and Ve, who became the rulers of heaven and earth. The children of Bor were good, those of Ymir wicked; and they were constantly at war with each other. The sons of Bor finally slew the ice-giant, dragged his body into the deep, and from it created the world. Out of his blood they made the sea and rivers; of his flesh, earth; of his hair, grass; of his bones, rocks; and stones of his teeth and broken jaws; of his head they made the heavens, which they extended over the earth by its four ends, at each of which they placed a dwarf, Austre, Westre, Sudre, Nordre. Of the sparks and light which had proceeded from Musspellheim they made stars, and fastened them to the heavens, to give light to the earth. They threw Ymir's brain into the air, and it formed the clouds. As Bor's sons were once walking on the sea-shore, they found two blocks, of which they created a man, called *Askur* (ash), and a woman, *Embla* (alder). One gave them life and soul; the second, motion and reason; the third, the face, language, hearing, and sight. This cosmogony is plainly a northern view of nature; we here see nature passing from the death of winter into life, and the beginning of the world connected with the appearance of spring. It was natural that, to the early Scandinavians, ice should have appeared as the primeval matter, and that it should be represented as evil, because it destroys the life of nature. The whole cosmogony is therefore a physical allegory, not inferior to those of other mythologies. The creation of day and night, the sun and moon, is thus related: The giant Darkness (*Niörwi*, *Narfi*) had a daughter of the name of *Night* (*Nott*), dark and sombre like her race. She was thrice married, and bore to Nagelfari (Air, Ether) a son, Audur (Matter); to Anar (the forming principle) Jord (the Earth); to Dellingar (Twilight) Dagur (Day), who was light, like his paternal race. Alfadur now took Nott and Dagur (Night and Day) to the heavens, and gave them each a horse and car, to drive round the earth daily. Night rode first on her horse, Hrimfaxi (Blackmane), which every morning bedews the earth with the foam from his mouth. The horse of Dagur, Skinfaxi (Shiningmane), illumines, with his mane, the air and earth. Mundilfari (Mover of the Axis) had two beautiful children, Sool and Maan (Sun and Moon). Proud of the beauty of his daughter, he married her to Glemur, the god of joy. The gods, offended at his presumption, took away his children, and transported them to the heavens. Sool was employed in driving the horses of the car of the sun, and Maan those of the car of the moon, and to watch over her increase and decrease. So far the most ancient mythology, which creates giants (*jötun*) from the elements of nature. It is remarkable that, in this mythology, the giants dwelling around the original chaos produce the lords of the heavens, the earth, and lower regions; and giants, Titans and Cyclops are also the ancestors of the Grecian gods; and, in the Grecian as in the northern mythology, a new race of gods drives out the ancient; or, in other words, historical traditions were confounded with the original ideas of nature.

The ancient and modern systems seem to have their connecting point in Odin, as with Jupiter in the Greek system. We must doubtless distinguish an earlier and a later Odin. The former was the symbol and deity of light and the sun, and there are several interesting fables relating to him; as, for instance, of his marriage with the earth; his daily amour with the goddess of the waters, to whom he descends every night, to drink of her element from the golden cup; of the marriage of his rays with the vapours of mother Earth, of which the fruit is the god of thunder, &c. All these fictions, however, were transferred to the younger Odin, the chief of the council of the Aser. The Aser (Asiatics) are the new race of gods, which came in with the younger Odin, or descended from him. It appears, from northern chronicles, that, in the first centuries of the vulgar era, if not still earlier, Sigge, the chief of the Aser, an Asiatic tribe, emigrated from the Caspian sea and the Caucasus (probably driven out by the Romans) into Northern Europe. He directed his course northwesterly from the Black sea to Russia, over which, according to the tradition, he placed one of his sons as a ruler, as he is also said to have done over the Saxons and Franks. He then advanced through Cimbria to Denmark, which acknowledged his fifth son, Skiold, as its sovereign, and passed over to Sweden, where Gylf, who did homage to the wonderful stranger and his gods, then ruled. He soon made himself absolute master there, built Sigtuna as the capital of his great empire, and established a new code of laws and a new religion. He himself assumed the name *Odin*, established the priesthood of the twelve Drottars, who conducted the secret worship, and the administration of justice, and, as prophets, unveiled the future. He is also the god of song and war. (Gibbon and Münter consider Odin a Shaman, and his doctrine Lamaism.) He was the inventor of the Runic alphabet, and made himself dreaded as an enchanter. But the Aser, that is, these new gods of the scalds, are as follows: Odin, the god of gods, the first and oldest of all, who lives for ever; he sits upon the elevated throne Lidskjalf, whence he observes every thing in the universe, alone, contemplating his own being. By his side stands the spear, Gungner. He has twelve chief names, and 114 others, in the ancient Asgard. His swift steed is called *Sleipner*. From him and his wife Frigga are descended the gods, on which account he is called *Alfadur* (Father of All), or, according to some, more correctly, *Walfader* (Father of All who fall in battle—a title which belongs to him as the ruler of Valhalla). Frigga, wife of the king of gods, shares with him the wonderful throne, from which all countries are seen. She knows the fate of all mortals, but keeps it secret. Their sons are Thor, god of thunder—a symbol of physical strength, the strongest of gods and mortals, whose mighty step sounds like the storm, whose hammer, Miolner (the Crusher), crushes the hardest objects—and Balder, the youthful and beautiful god of eloquence and just decision, the innocent who appears brilliant as the lily, and in honour of whom the whitest flower received the name *Baldrian*. His wife, Nanna, daughter of Gewar, looks with modest admiration on the mind of her husband. She bears Forfete, the god of concord, who resembles the rainbow, when it descends from the dark cloud. He puts an end to all strife. His palace, Glitner, rests on pillars of gold. Niord, who shakes his vans in the roaring storm, so that every thing trembles, is the god of winds, of sailors, of commerce, and of riches. By his wife, Scada, a daughter of the mountain-giant Thiasse, he had the beautiful, beneficent, and mighty Frei and Freia. Frei, who floats in the shining garments of spring, is the ruler of the sun, and upon him depend rain and sunshine, plenty, or dearth. He rules in Alfheim, where the elfs dwell. Instead of a horse, he rides a boar with golden bristles. Gerda, Gymer's daughter, is his wife. Freia, Fraa, is the goddess of love. Her eye is an eternal spring; her neck and cheek light. The mildest and most bountiful of the gods, she is a friend of sweet song, and loves to hear the prayers of mortals. She mourns her lost husband, Odur, to whom she had born two daughters, Nossa, the model of all beauty and grace, and Gersemi. Tyr, a son of Odin, the fearless god, who wounds by a look, is lofty as a fir, and brandishes the lightnings of battle. All brave warriors are under his protection, though he is not properly the god of war, but rather of power and valour, and no friend of peaceful agreement. Of a different character is his brother Braga, the god of wisdom and poetry, which, from him, is called *Bragur*. He appears with a golden *telyn*, and strikes the cords, which emit a sweet sound. His wife is Iduna, who preserves the apples of immortality, which she offers in vessels of gold to the heroes at their entrance into Valhalla—those apples which alone preserve the eternal youth of the gods. Other sons of Odin are Hermode, the messenger of the gods, armed with a helmet and mail; Vidar, strong as Thor, the god of silence; and Wale, the god of the bow. Uller, son of Thor the Thunderer, is of a beautiful figure, master of archery and skating, who was invoked by those who engaged in single combat. A silver circle surrounds the down of his chin. His empire is Ydalir (that is, Rain-valleys).

The following gods are of a most mysterious character:—Hoder, the blind god, murderer of Balder, whose violent deed the gods never forget, but whose name they must never hear pronounced; Heimdal (Himindal), a son of nine gigantic sisters, born on the margin of the earth, a great mysterious god guards the Bifrost, the bridge to heaven (rainbow), against the giants. He sees as plainly by night as by day; his ear hears the grass grow in the field, and the wool on the lambs. He is represented with a pensive brow, his eye fixed upon his calm breast.

Among the goddesses, we must mention Laga, the first next to Frigga; Syra, the physician of the gods; Gesione, goddess of chastity, who, herself a virgin, protects all chaste virgins, and, if they die unmarried, takes them to her heavenly dwellings; Jylla, a virgin like Gesione, with beautiful locks, and a diadem of gold, is intrusted with the secrets of Frigga, whose messenger, Gna, floats about with the rays of the sun; Hlyn (Lyna) the Gentle, who kisses away the tear from the eye of the unfortunate, the goddess of friendship and good faith, who is united with several servants of the goddess of love; Siona, who awakens the first sweet feelings in the breasts of youths and maids, and disposes them to mutual love; Lobna (Lofna), endowed with the power to reconcile divided lovers; Wara, the goddess of marriage, who hears the secret vows and oaths of lovers, punishes the faithless, and unites the true; Snotra, the goddess of modesty, is the protectress of virtuous youths and maids; Wora, the all-knowing, penetrates every secret of the heart; Synia, the guard of heaven, is the goddess of justice and law, and exposes perjury.

A large ash (or an ash forest), called *Ygdrasil*, the tree of the world, stands over the well of time: its branches extend over the world, its top reaches above the heaven. It has three roots, one among the gods, another among the giants, and a third under Hela. Near the middle root is the fountain of wisdom, the fountain of Mimers. Near the heavenly root is the sacred fountain by which the gods hold their council, and make known their decisions. From these fountains rise three beautiful maids, the Nornas, whose names are Urd (the Past), Varande (the Present), and Skuld (the Future). They determine the fate of mortals, and aid or punish them by their ministers. On the top of the ash sits an eagle, looking far around; a squirrel (Rotatoskr) runs up and down the tree; four stags (Dain, Dynair, Dnalin, and Dyrathor) roam through its branches, and eat the bark; a serpent gnaws its root below; the trunk of the tree rots; but the holy maids water it from the sacred fountain, that it may not wither. From the leaves of the ash falls a sweet dew, the food of bees. Over the fountain sing two swans. Here are heard Heimdal's song of the fate of the tree of the world; the voices of the past, the present, and the future, in the council of the gods. The gods themselves seek to learn the wisdom of the Nornas, the stern goddesses who rule over all. On this account, they were much honoured; temples were built in their honour, in which their oracles were consulted.

The Valkyrias, or Disas, are awful and beautiful beings, neither daughters of heaven nor of hell; neither begot by gods, nor cradled in the lap of immortal mothers. Nothing is said of their origin. Their name signifies the "choosers of the slain" (from *wal*, a heap of killed, and *kyria*, to choose). They appear awful and horrid in the songs of the scalds;

yet we find them to be the beautiful maids of Odin, with helmet and mail, and mounted on swift horses. Heroes long for their arrival, enamoured of their charms. They conducted the heroes to Valhalla.

The residence of the gods is Asgard, a fortress of heaven, whence the bridge Bifrost leads to the earth. Asgard contained the palaces of the gods. There was Valaskialf, the silver palace of Odin, with all the above-mentioned divinities. In the centre of Asgard, in the valley of Ida, was the place of meeting, where the gods administered justice. This place was the most highly ornamented of all. Here was Gladheim, the hall of joy; Wingolf, the palace of friendship and love; and Glasor, the forest of golden trees. Valhalla was a separate palace, with groves and beautiful environs: in it was the dwelling of heroes who had fallen in battle. Here life is passed in bloody war and riotous revelry. But all wounds here received in battle are healed as soon as the trumpet sounds for the feast; and then the heroes quaff the oil of Enherium, and the beautiful Valkyrias fill their cups.

The number of heroes is immense, and will increase indefinitely; yet the gods will wish that it were still greater when the wolf Fenris comes. This leads us to throw a glance at the wicked Loke. Loke, the son of the giant Farbaute and of Laufeya, is, if not a god, yet a superhuman being, beautiful of body, but malignant of spirit. By the giantess Angerbode (Messenger of Evil) he had Hela, the goddess of the lower regions, half blue and half flesh colour, and with a terrible figure, the wolf Fenris, and the terrible serpent of Midgard, Jormungandur, which surrounds the whole earth. Hela rules in Niflheim. Her hall is called Elidnir (Grief); her bed Kor (Disease); her table Hungr (Hunger); her servants are Ganglati and Ganghol (Lethargy and Delay). All who died of sickness and old age descended to her dark mansion. Thus Niflheim and Asgard are opposed to each other as existence and non-existence, and the scalds imagined that destruction would finally be victorious over every thing that is: hence their idea of the end of the world. Three terrible winters, and again three more, will succeed each other: snow will rush in from all sides: the cold will be severe, the storms violent, the sun covered, and bloody wars will distract the whole world. This is the sign that the destruction of the world, and the great "twilight of the gods" (thus the end of the world is called) is nigh. The wolf Fenris—a monster which, when it opens its jaws, touches the skies with the upper, and, with the lower, the primeval abyss—devours the world, while the inhabitants of Musspellheim, under the command of Surtur, make an attack upon Asgard. Heaven is stormed by these giants, and heaven's bridge falls when they ride over it. For this reason, Heimdall is placed there as a watch, and the gods look with pleasure upon the numerous combatants of Valhalla. But all precaution is vain: the gods must perish, even the all-powerful Odin and the mighty Thor. A new sun will then illumine the earth, and Lift and Liftrasor—a human pair saved from the destruction, and nourished on morning dew—will renew the human race. There will be new dwellings for the just and unjust, for reward and punishment—Gimle (a splendid residence towards the southern end of heaven) and Nastrand. Widar (the Conqueror) and Wale (the Powerful) will live in the dwellings of the gods, after the flame of Surtur is quenched. Mode (Mental Power) and Magne (Strength) will receive the crushing hammer, after Thor, exhausted by the struggle, has perished, and Widar tears the jaws of the wolf asunder.

These mythuses have been preserved in the Edda and the Sagas (See Müller's *Sagabibliothek des Scandinavischen Alterthums*, Berlin, 1816), by Procopius of Cæsarea, Jornandes, Paulus Diaconus (son of Warnefried) Ermoldus, Nigellus, Adam of Bremen, Saxo Grammaticus. Schlozer, Adelung, Delius, Mallet, Nyerup, Grater, and Rühs, entertain very different, sometimes contradictory, opinions respecting their historical value. (See *Edda*.) The subject cannot, however, be considered as completely examined. Another question has been started, whether this northern mythology was also Germanic. At all events, those Scandinavians are connected by origin with the Germanic tribes, and, as Germanic tribes passed the Rhine, so other tribes pressed in from the North and East, and Goths and Saxons brought this mythology to Germany.—See Nyerup's *Dictionary of Scandinavian Mythology* (Copenhagen, 1816, in German); Kattenfeld's *Dissertations on the Doctrine of the Asas, and its Application* (in the Isis of 1819, in German); Mone's *History of Paganism in Northern Europe* (in German); bishop Munter's *Ecclesiastical History of Denmark and Norway* (the first book of vol. i. treats of the Scandinavian paganism of Odin; Leipsic, 1823, in German); and Vulpius's *Dictionary of the Mythology of the German and the kindred Tribes, and the Northern Nations* in (German); see, also, vol. i. of Geijer's *History of Sweden* (in Swedish and in German, Salzburg, 1826), and *Edda Sæmunder hins Froda* (part iii. Copenhagen, 1828), containing the *Voluspá*, *Kávamál* and *Rigsmál*, with a Dictionary of the Ancient Northern Mythology, by professor Magnussen.

NORTHERN WAR, from 1700 to 1721. The *northern war* (so called), in the north and east of Europe, was contemporary with the Spanish war of succession in the west. The king of Poland, Augustus II., elector of Saxony, the czar Peter of Russia, and the king of Denmark, secretly united against the king of Sweden, Charles XII. (q. v.), 1698, then only sixteen years old, to regain the provinces ceded to Sweden, by the treaties of Copenhagen, 1660, of Oliva (q. v.), 1660, of Kardis, 1661. A Danish army, therefore, invaded the states of the duke of Holstein-Gottorp, the brother-in-law of Charles XII., to enforce Denmark's claim to the sovereignty of Sleswic, and a Saxon army invaded Livonia. But Charles XII., who had gained the naval powers (England and Holland) to assist his cause, by a treaty concluded at the Hague (1700), landed in Zealand, and the allied Swedish, Dutch, and British fleets bombarded Copenhagen. This compelled the king of Denmark, Frederic IV. to separate from the league, at the peace of Traventhal (August 18, 1700), and to acknowledge the sovereignty of the house of Gottorp over Sleswic. Charles now advanced against the Russian army, which besieged Narva, in Esthonia, and completely defeated it, November 30, 1700. Upon this he compelled the Saxons to evacuate Livonia in 1701, and proceeded towards Warsaw, when the party of Sapieha, in Poland, declared themselves against king Augustus. He defeated the Polish-Saxon army at Clissow (July 20, 1702), then the Saxons at Pultusk (May 1, 1703), and effected the dethronement of king Augustus at the diet of Warsaw (February 14, 1704), as also the election of the palatine of Possen, Stanislaus Leczinski (July 12), to the throne of Poland. Lastly, he obliged king Augustus, after the defeat of the Saxon general Schulenburg, at Punitz (November 9, 1704), and at Fraustadt (February 13, 1706), by his march into Saxony, to sign the peace of Altranstadt, (q. v.), September 24, 1706. In the mean time the Russians, commanded by general Scheremeteff, had defeated the Swedish general Schlippenbach, in Livonia (January 11, 1702); they had captured Marienburg, and taken Noteburg, on the Neva (October 22), which the czar then called *Schlüsselburg*. May 27, 1703, Peter laid the foundation of St Petersburg, on the island Lusteiland, in the Neva. In 1704, he took Dorpat and Narva; in 1706 and 1707, he gained such power in Poland, that he began to take measures for the election of a new king; and the confederacy of Sandomir allied itself to him in 1707, although the republic had made a treaty in 1705 with Sweden. But Charles XII. returned to Poland from Saxony with a formidable army of 43,000 men (September 20). He soon made himself master of the principal towns, crossed the Berezina, July 10, 1708, and beat the Russians under Scheremeteff, before Golowtschu, July 14. From Mohilew he proceeded to the Ukraine, September 15, at the invitation of the Cossack hetman Mazeppa. (q. v.) In the mean time his general Lowenhaupt, who was to join him with fresh troops, and supplies of provisions and ammunition, was entirely defeated by Peter at Liesna (October 9). Menschikoff devastated the Ukraine in November, and Charles was obliged to take up winter quarters there, where he lost 4000 men by hunger and cold. Mazeppa succeeded in making a treaty for Charles XII. with the Zaporogian Cossacks (March 28, 1709); but this very event induced the king, instead of restoring his connexion with Poland on the Dnieper, to lay siege to Pultawa (q. v.) (April 4). Here his army, which consisted of 12,000 Swedes and 13,000 Cossacks and Walachians, was entirely routed by the Russian army of 60,000 men, which was under the command of Scheremeteff, Menschikoff, and Bauer, Peter himself acting as a colonel June 27 (July 8), 1709. Charles retreated over the Dnieper; his general Lowenhaupt was taken prisoner, with 16,000 men (July 11), at Perevolotschna. During five years Charles endeavoured to excite the Porte against the czar. (See *Pruth.*) The king of Denmark, on the other hand, renewed his alliance with Augustus II. at Dresden, June 28, 1709. The latter declared (August 8) the peace of Altranstadt invalid, and advanced towards Poland with 13,000 men, where he was again received as king, and renewed his alliance with the czar, at Thorn (October 8), renouncing all the claims of the republic of Poland on Livonia, in favour of Russia. October 22, 1709, the czar also concluded an alliance offensive and defensive with Denmark, at Copenhagen. A Danish army (November 12) invaded Schonen, but was completely defeated by general Steenbock (March 10, 1710) at Helsingborg, and compelled to retreat to the ships. An army composed of the united Saxon, Polish, and Russian forces, however, invaded Swedish Pomerania (August, 1711), and a Danish army conquered (in the period from July to September, 1712) the Swedish duchies Bremen and Verden. The Swedish general Steenbock, indeed, after having beaten the king of Denmark, and the Saxons under the field-marshal Flemming, at Gadebusch, in Mecklenburg, December 20, advanced to Holstein, and Jan. 9, 1713, reduced Altona to ashes; yet he was forced, by the united Russian, Danish, and Saxon forces, in which the czar was present, to withdraw to the Gottorp fortress Tonningen (Feb. 14), where he was compelled by famine to capitulate (May 16), with 11,000 men. The duke of Gottorp now lost his possessions, and the Russians took Stettin, which was put provisionally in the hands of the neutral king of Prussia, Sept. 30, 1713. At the same time, Peter had occupied Riga (1710), Finland, and Aland. Charles arrived at Stralsund Nov. 22, 1714, where he immediately demanded of Prussia the evacuation of Stettin, and declared war when this demand was not complied with. The consequence was, that 20,000 Prussians, under Prince Leopold of Anhalt-Dessau, joined the Danish-Saxon army, which was besieging Stralsund. (The Saxons were commanded by the field-marshal count Arnim, and by count Wackerbarth.) Charles XII., being thus reduced to extremities, sued for peace through the ambassador of Louis XIV., with whom he made a defensive treaty at Versailles, April 3, 1715; but the allies would not consent to his proposals. He escaped in a Swedish vessel in the night of December 21, upon which Stralsund capitulated (Dec. 23, 1715). Wismar, also, the last possession of Sweden in the German territory, submitted to the Danes (April 19, 1716). Denmark had, by the treaty of June 26, 1715, sold the duchies of Bremen and Verden to the elector of Hanover, who now declared war against Sweden. The czar had also allied himself with Great Britain against Sweden (at Greifswald, Oct. 28, 1715), and with Prussia (Oct. 30). But jealousy soon separated the allies. The czar would not consent to Denmark's aggrandizement; England would not favour the increasing power of Russia. The Poles also confederated to effect the expulsion of the Saxon troops from their country. The diet of Warsaw at length resolved that the king should not retain more than 1200 Saxons in Poland for his body-guard, and that he should never, without consulting the diet, declare an offensive war. This obliged Augustus II. to take no further part in the northern war, which was carried on, during 1716, in Schonen and Norway; but the czar did not assist the Danes. Sweden was, however, deprived of her oldest ally, France, which secretly joined Prussia in 1716. Baron Gortz (q. v.) endeavoured, in 1718, to ally Russia to Sweden, by ceding the provinces on the Baltic, so that the Russian forces, combined with those of Sweden, might regain the German provinces, subject Norway, and execute Alberoni's plan of restoring the house of Stuart to the throne of England. But on the death of Charles XII. (Dec. 11, 1718), the queen of Sweden, Ulrica Eleonora, influenced by the party of Horn, defeated the project. She, however, concluded, under the mediation of France, (*a*.) the peace of Stockholm, 1. with the elector of Hanover, Nov. 20, 1719; Hanover retained Bremen and Verden, making a pecuniary compensation to Sweden; 2. with Prussia, Feb. 1, 1720; Prussia, for two millions of dollars (*thaler*), retained possession of Stettin, and Hither Pomerania, as far as the Peene; (*b*.) the peace of Fredericsborg with Denmark, July, 14, 1720; Denmark kept half of the duchy of Sleswic, which the house of Gottorp lost, and ceded all which it had conquered (Wismar, Rugen, Stralsund, &c.); Sweden gave up her immunity from duties in the Sound and the Belts, and paid to Denmark 600,000 dollars (*thaler*): (*c*.) with Poland a secret armistice at Stockholm (Jan. 7, 1720), which was declared a peace in 1729, and sanctioned by the estates on both sides; Augustus II. was acknowledged king of Poland, but paid one million dollars (*thaler*) to Stanislaus Leczinski. The czar, in the mean time, continued the war; a Swedish squadron was defeated by the Russians (August 7, 1720); the coast of West Bothnia, and, in 1721, that of Norriand, was barbarously devastated. (The Russians burned four towns, 509 villages, and 379 farms). Stockholm, however, was protected by a British fleet against the Russians. At last, the mediation of France effected a peace, which was concluded at Nystadt, in Finland, Sept. 10, 1721. Sweden ceded to Russia, Livonia (for which the czar gave two million dollars, *thaler*), Esthonia, Ingria, and Carelia, part of Wiborg, besides all the islands on this coast, particularly Œsel, Dagoe, and Moen. For this the czar restored Finland, and promised not to interfere in the domestic affairs of Sweden. Thus Russia became the first power of the North, and

Sweden lost this rank, which it had retained from 1648 to 1709.

NORTH GEORGIAN ISLANDS. See *North Polar Expeditions.*

NORTHMEN. See *Normans.*

NORTH POLAR EXPEDITIONS. The daring and hardy mariners of England have, within the last 350 years, penetrated into the remote Arctic regions. Cabot, according to his recent biographer, penetrated into Hudson's bay in 1496. Frobisher, in 1577, sailed into one of the many entrances of Hudson's bay. Davis discovered, in 1587, the entrance (Davis's strait) into the great bay between the western coast of Greenland and the eastern coast of North America; Hudson discovered and examined, in 1610, the straits and bay called after him; Baffin examined, in 1616, the eastern parts of the great channel, called from him *Baffin's bay*, in which Davis's strait terminates. On the western side he discovered (74° 30′ N. lat.) an entrance which he called *Lancaster sound*, but was prevented from examining it; Jones, Middleton, in 1742, and others, explored the western, southern, and northern borders of Hudson's bay. It was expected to find a passage here towards the west, and a prize offered by parliament for the discovery of such a passage, led to the voyage of Ellis, in 1746. At a later period (1771), Hearne reached the Northern ocean by land, from the north-western settlement of the Hudson's bay company; and Mackenzie, in 1780, from that of the North-west company. They discovered (69°—71° lat.) the Frozen ocean, and two rivers which emptied into it. Hearne discovered the mouth of the Coppermine river, and Mackenzie that of the river called by his name, and Whale island. Barrington endeavoured to prove, in his Possibility of approaching the North Pole asserted (new edit., with an appendix by colonel Beaufoy, London, 1818), that in certain seasons the Arctic seas were sufficiently free from ice to allow an approach to the poles. The British government, therefore, in 1773, sent captain Phipps, afterwards lord Mulgrave, with two vessels, to Spitzbergen; but in 80° 48′ the ice prevented them from proceeding any farther. Cook was also stopped in his progress by the ice (1778), at Icy cape (lat. 70° 44′), which he reached from Beering's straits. These and other attempts of the British, Dutch, and Russians seem to show sufficiently that a north-east passage from the Atlantic into the Pacific ocean, or a navigable way round the north coast of Asia into Beering's straits, is not practicable.[*]

The *polists*, as they were called, as Barrow (in his *Chronological History of Voyages into the Polar Regions*, London, 1818), and others, were of opinion that the north-west passage, from Baffin's bay along the north coast of America, where the Mackenzie and Coppermine rivers fall into the Frozen ocean, and round Icy cape into Beering's straits, which is shorter than the former, or even the polar passage, the shortest of all, would not be entirely shut up by ice. They asserted that an error had hitherto been committed in sailing always too near the shore, which was surrounded by enormous masses of ice; and that the middle of the Polar sea, which was more than 2000 miles in diameter, and, between Greenland and Spitzbergen, was of an unfathomable depth, and in constant motion, could not be frozen up, and would therefore afford a navigable passage. They argued from the following facts: The Polar sea is open on the northern coasts of Spitzbergen; the Russians wintered in Spitzbergen, under 80° lat., where the deer propagate. Neither of these facts are true of Nova Zembla (75° lat.); from which they conclude that in Spitzbergen the weather must be milder than in Nova Zembla. Moreover, the cold on the eastern coast is more severe than on the western. For about five years (the period of the deviation of the needle towards the west), immense masses of ice had broken away round Greenland; perhaps in consequence of their increasing weight, and of earthquakes, or of several successive mild winters; hence the icebergs, which, from 1815, were so numerous, down to 40° lat. Several whalers had also stated, that the eastern coast of Greenland, hitherto surrounded, had recently become visible again. Finally, the currents, which set from the north through Davis's and Beering's straits towards the south, by which a constant circulation and change of the waters is kept up between the Northern Pacific and the Atlantic oceans; the great quantity of drift wood, which is brought down from the high northern latitudes along the coasts of Iceland and Greenland; and instances of whales, which, as was shown by the harpoons found in them, had been struck off Spitzbergen, being taken to the south of Beering's straits; and of others wounded in the latter region being taken off Greenland and in Davis's straits,—render a passage through Baffin's bay probable.

According to historical accounts, the Polar sea on the eastern coast of Old Greenland, had been unapproachable for four centuries. The Danish colony, established in 983 by Eric the Red, prospered; but the coast itself became so blocked up by ice (from 1406), that the communication between Europe and that colony, probably long since destroyed, had never been restored. Since that period, also, the soil of Iceland, once covered with wood, had lost its former power of vegetation. To this was added that the aurora borealis, the changes of which were said to depend upon the freezing, thawing, and collision of polar ice, first appeared about a century after the settling of the ice along the coast of Greenland, but has been less often seen since the diminution of the polar ice. On these observations was founded the opinion that the polar ice would naturally disappear, as it had accumulated, in the course of time, and also the conjecture that Greenland, the eastern coast of which was known as far as 80° lat., and the western coast hitherto only to 77° 30′, is an island, and that Baffin's bay opens into the Frozen ocean. On the other hand, it was supposed that America is not connected with New Siberia and Northern Asia beyond the Icy cape.

These considerations led the British government, and at a later period the Russian, to undertake polar expeditions, which were destined, not only to attempt the discovery of a north-west passage, but also, in general, to examine the northern coasts of Asia and America, and determine whether there is a large extent of land around the north pole, which is connected towards the west with America, and towards the east with New Siberia, or with the great continent, which Sannikoff declared he had seen north of New Siberia; or whether, as many believe, North America be entirely separated from the polar countries. Parliament offered a premium of £20,000 sterling to the first navigator who should accomplish the north-west passage, and £5000 sterling to the first vessel which should reach the north pole and pass it. In 1819, the prince regent offered prizes of from £5000 to £15,000 to those vessels which should advance to certain points in the Arctic seas. The British government, therefore, fitted out two expeditions in the summer of 1818, to the north pole. Captain Buchan, commanding the Trent and the Dorothy, was instructed to attempt a passage between Spitzbergen and Nova Zembla, over the pole, into the Pacific, and captain Ross, commanding the Isabella and the Alexander, to attempt the north-western passage from Davis's straits and Baffin's bay into the Frozen ocean, and thence into the Pacific. The commanders and crew were carefully selected, and provided with every thing necessary. Captain Buchan, however (July 29, 1818), reached only 80° 32', north of Spitzbergen, where he remained three weeks, frozen in, and arrived on the English coast October 10.

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[*] It is, however, said that the Cossack Simeon Deschneff sailed, in 1648, out of the Frozen sea to Anadyr through a strait (Beering's straits), and the Russian historiographer Muellor assures us that he saw the account in 1736, in the archives of Yakutzk. This voyage, however, is doubtful.

Captain Ross, who was directed particularly to examine the western coast of Baffin's bay, had penetrated (August 9, 1818) only to lat. 75° 55' in 65° 32' W. lon. He examined a part of the western coast of Greenland, which he called the *Arctic Highlands*, in the north-east corner of Baffin's bay, between 76° and 77° lat., and 60° to 72° W. lon., 120 miles in extent, and containing many mountains covered with ice. He found there moss, heath, and coarse grass, game and hares, and a large mass of native iron. The only domestic animal of the inhabitants, who resemble Greenlanders, is the dog, which they use to drag their sledges, made of seals' bones. Their language is a dialect of the Esquimaux. They are of a dirty copper colour, five feet high, and besmeared with train-oil and dirt. They eat meat raw or cooked. They appear not to have any idea of a God, but believe in charms. Women who have borne children are treated with much respect. Their dances and songs are accompanied by convulsive distortions. They had not the slightest idea of other parts of the world, or other men. Ross found most of the statements of Baffin correct. His own discoveries, properly speaking, did not begin before 74° 30' lat. He reached 77° 40' lat., and the chief geographical result of his voyage was the more accurate determination of the situation of Baffin's bay, which, until then, was believed to extend 10° farther to the east than it actually does. Ross was convinced that there is no passage from Baffin's bay or Davis's straits into the Frozen ocean. Although he sailed up Lancaster sound (74° 30'), he did not continue his progress far enough to discover that it was open, and a space of 200 miles, particularly Cumberland strait (63° lat.), where a current appeared, and Repulse bay in the north-west of Baffin's bay, was not accurately examined, as he did not arrive there till October 1, and was obliged to leave the coast on account of the danger from the ice.—See Ross's *Voyage of Discovery for the Purpose of exploring Baffin's Bay* (London, 1819, 4to).

The British government, therefore, in 1819, sent out lieutenant Parry, who had accompanied captain Ross, on a second voyage into Baffin's bay. He penetrated, with his vessels, the Hecla and Griper (the latter commanded by lieutenant Liddon), through Lancaster sound into Barrow's strait, in which he examined Prince Regent's inlet, running in a southern direction, and the Polar sea, and wintered in the harbour of an uninhabited island, which he called *Melville island* (74° 45' lat.). As he had passed (September 10), 110° W. lon. of Greenwich, he was entitled to the first prize offered by parliament. According to his discoveries, the land stretches along the northern side of Lancaster sound and Barrow's strait, to 93° W. lon. Beyond this, towards Melville island, there are merely separate islands; whilst, on the southern side, an unbroken tract of land extends in a western direction, which stretches on the other side of Prince regent's inlet, far to the west, and borders on a plain of ice, which extends to the highlands, visible in a south-westerly direction from Melville island. The land, seen to the north of Barrow's strait and Melville island, appeared to be a group of islands which Parry called the *North Georgian islands*. With eleven companions, he explored Melville island, and reached, on June 6, the northern coast (75° 34' 47" lat., and 110° 36' 52" lon.). They found no inhabitants, but there were some remains of Esquimaux huts, a musk-ox, and reindeer. August 1, Parry left the winter harbour, where he had remained ten months. He now steered towards the west, discovered, towards the south, the coast of Bank's land, but was obliged, by immense fields of ice, August 16, 1820, in 113° 46' 33" lon. (the most western point ever reached in the Polar seas) and 74° 27' 50" lat., to return through Davis's straits to Britain, where both vessels entered the harbour of Leith, October 29, 1820.

These discoveries gave some hope of final success, and captain Parry sailed with the Hecla and Fury, May 8, 1821, with provisions for several years. He was instructed to examine the north coast of America. Parry commanded the Hecla; captain Lyon, who had just returned from a journey through the hot deserts of Africa, the Fury. They entered, between 62° and 68° lat., into Hudson's bay, in order to examine the northern inlets. The first, Repulse bay (68° lat.), permitted (August 22) no passage. The chief object, therefore, was not obtained. Parry now sailed to the north, with the intention of penetrating to the west, but was obliged, after having examined 200 miles of coast, half of which, and particularly the east side of Repulse bay, belonged to the continent, to return, on account of the ice; and, October 8, he went into Winter harbour. Here he passed the long winter, as he had previously done on Melville island, occupied with astronomical and scientific observations. The tedium of the delay was somewhat relieved by playing comedies. A magnificent northern light was seen, and a splendid mock moon. Visits were paid by the kind-hearted and mild Esquimaux, who were docile, honest, peaceable, and fond of music. Whilst the thermometer stood at 24°, journeys were made into the interior. The ice was found not to be more than five feet thick, though a severe frost lasted five months. Walls of snow round the vessels, and over the deck, were a protection against the cold. The Esquimaux lived in huts of snow, with windows of ice. The vessels were not freed from the ice before June 30, 1822. They then sailed to the north, discovered on July 13, the Barrow river, with a beautiful cascade, on a picturesque coast, covered with plants; made journeys on land, observations of the disturbances of the needle, first discovered by captain Flinders, and different from the variation (the disturbance is the greatest near the north pole, and is different as observed in or out of the vessel), and examined Fury and Hecla's strait, between Melville peninsula (not to be confounded with Melville island) to the south, and Cockburn island to the north, to the northern point of the peninsula, which was called *North-East cape*. Towards the west no land was seen; but, as fields of ice made it impossible to get from these straits into the Polar sea, they were obliged to rest satisfied with the examination of Amherst island, 69° 45' lat., 84° lon. Towards the end of September, Parry sailed out of the strait back to Igloolik (69° 20' lat.), where he wintered among the Esquimaux. August 7, 1823, he again entered this strait in search of the Polar sea; but the opening was closed, and, as Parry was unwilling to attempt the passage with the Fury alone, both ships returned the last of August, got free from ice September 21, and reached the Shetland isles, October 10, 1823. Excepting some important nautical, geographical, and scientific observations, the chief object of the expedition, a complete description of this icy waste was not effected. Walruses, seals, bears, reindeer, wolves, white and black hares, white foxes, ermines, a single squirrel, many kinds of ducks, ptarmigans, snow-birds, single ravens, also a swan's nest, and some stunted Alpine plants, *rumex digynus*, &c., were discovered in these barren regions.—See the *Journal of a Second Voyage for the Discovery of a North-West Passage from the Atlantic to the Pacific*, 1821—1823, *under the orders of Captain Parry* (London, 1824, 4to). Jamieson, Hooker, and Richardson, described, in a separate volume, the objects of natural history collected by the expedition.—See likewise *Journal of a Voyage of Discovery to the Arctic Regions*, 1819 and 1820, by Alexander Fisher, physician to the Hecla (London, 4to, 1824).

Captain Sabine returned to Britain in the Griper, from Spitzbergen, soon after Parry, December, 1823. The object of his voyage had been to make observations on the pendulum. In August, 1823, he advanced as far as 81° lat., in 25° 20′ E. lon. In Spitzbergen he found the bodies of the Russians buried eighty-five years before, in so perfect a state of preservation, that the cheeks had the freshness of life. His experiments with the pendulum confirmed the theory of the flattening of the earth towards the poles. The results of his astronomical observations, made in June, on the island of Hammerfast, on the coast of Norwegian Lapland, were communicated to the royal academy of science.

Captain Scoresby, the celebrated Greenland voyager, who had first, in his voyages in 1817 and 1820, approached the eastern coast of Greenland, became more accurately acquainted with it in 1822, when he explored it to 75° lat.; the field of ice, which had formerly prevented any approach to it, having been very much diminished in extent. But it is still doubtful whether it will be possible to obtain any information concerning the old Norse colonies on this coast. —See Scoresby's *Journal of a Voyage to the Northern Whale Fishery, including Researches and Discoveries on the Eastern Coast of West Greenland.* (Edinburgh, 1823.)

At the same time that captains Parry and Ross were seeking for a north-west passage into the Polar sea, captain Franklin was sent by the British government to penetrate to the northern coast of America by land, along Hudson's bay and Coppermine river. With three companions, among whom was the naturalist, doctor Richardson, he reached (August 30, 1819) the factory of York, on Hudson's bay, and, following the course of the rivers, passed through a barren wilderness of great extent, which was inhabited by, at the most, 120 families of hospitable Crees. From Providence—the most northern post of the fur-traders (62° 17′ 19″ lat.)—Franklin, accompanied by Canadians as interpreters, continued his route through unexplored deserts, but was compelled to winter there for ten months from September, 1820. In the summer of 1821 he reached the Coppermine river, and, in the last of July, sailed along the coasts of the Northern sea. Want of provisions compelled him to return, and he reached, December 17, a post of the Hudson's bay company, on Moose-deer island, in a state of great exhaustion. July 14, 1822, he arrived at the factory of York, after having travelled, altogether, 5550 English miles. His narrative of a Journey to the Shores of the Polar sea (London, 1823, 4to,) contains the results of his expedition.

In May, 1824, the British government fitted out a third polar expedition for the discovery of a north-west passage through Prince Regent's inlet, under Parry and Lyon. The former, with the Hecla and Fury, arrived, July 13, 1824, at Whale island, in Baffin's bay, the limits of ice (71° N. lat.); September 13, proceeded through Barrow's straits to Admiralty bay, and, September 27, arrived at Port Bowen, in Prince Regent's bay, where the ships wintered. Thence Parry sailed southwardly, July 20, 1825. Storms and icebergs drove the ships ashore, and, on the 25th, it became necessary to abandon the shattered Fury. The Hecla was consequently compelled to return, and, with the crew of the Fury on board, arrived in England October 11, 1825.—See the *Journal of a Voyage*, &c. (London, 1828).

Captain Lyon, in the Griper, accompanied by naturalists and astronomers, also sailed for Baffin's bay, whence it was intended that he should proceed by land to the polar regions, to meet captain Parry on these coasts, in the summer of 1825. But, August, 1824, he became entangled among the icebergs, on the coast of Labrador, and, after encountering great dangers, reached Southampton island in September. In lat. 66°, the Griper lost her anchors in a most violent snow storm, and was obliged to return to England. The disturbances of the magnetic needle, observed by captain Lyon, were remarkable. Near Savage islands, the needles fluctuated, and did not agree with one another; further westward, they became still more unsteady, and entirely useless. At length, in Rowe's Welcome, the needles showed, indeed, no variation, but remained in any direction in which they were placed. See *Narrative of an unsuccessful Attempt to reach Repulse Bay, through the Welcome, in H. M. Ship Griper*, &c.

In 1825, captain Franklin undertook a new journey over land, with the intention of sailing westerly from Mackenzie's river along the coast to Beering's straits, while doctor Richardson should examine the country, with a view to complete its natural history, from the mouth of that river to the Coppermine river. At the same time, captain Beechey sailed in H. B. M. ship Blossom, by the way of cape Horn, to discover an easterly passage round the Icy cape, or in Kotzebue sound. In six months, Franklin reached the Northern ocean, near Garry's island (69° 30′ lat.), and returned upon the Mackenzie to his winter quarters at fort Franklin, on Great Bear lake. Both parties left their winter quarters June 21, 1826, and, July 2, separated, in 67° 38′ lat. and 133° 52′ W. lon. Franklin followed down the western arm of the Mackenzie, which runs along the foot of the Rocky mountains. He had thus examined the coasts of the Polar sea—a barren wall of rocks, from 113° to 149° 38′ lon. Floating ice and fogs compelled him to return; but he was fully convinced that a north-west passage was open. The other division, under Richardson and Kendall, explored the coast from the eastern branch of the Mackenzie to the Coppermine river, whose mouth they reached August 8, and returned, after seventy-one days' absence, to fort Franklin, upon the Great Bear lake. They found much drift wood upon the coast. According to these observations, there is an open passage for ships along the northern coast of America, from 108° to 149° W. lon., towards the end of August, and to the east of Mackenzie's river are several convenient harbours. The two divisions of the expedition examined the coast throughout an extent of 36°. Between the extreme point reached by Franklin and Icy cape only 11° of this coast are unknown. Meantime, captain Beechey, in the Blossom, had sailed north from Kotzebue's sound, and had penetrated over 120 miles beyond Icy cape. Here he waited in vain for captain Franklin's arrival in 154° W. lon., and in a latitude where the length of a degree is only about twenty miles; but he was obliged to return October 14. Captain Franklin had approached to within a short distance of the Icy cape, which is in 160° W. lon., when, out of regard to the safety of his men, he was obliged to give up his plan of pressing forward to Kotzebue sound, and returned to the Great Bear lake, which he entered September 21. The point which this expedition reached lies in about 70° 30′ N. lat. Collections in natural history, magnetical experiments, and observations on the effect of the aurora borealis upon the magnetic needle, were the fruits of this expedition, from which captain Franklin returned to London, September, 1827.—See Franklin's *Second Expedition to the Polar Sea* (London, 1828); Richardson's *Fauna Bor Am.* (1829); and Beechey's *Voyage to Beering's Straits* (London, 1831).

The admiralty now sent captain Parry, in the Hecla, to reach the north pole. He took reindeer and ice boats on board at Hammerfast, in Lapland; reached Spitzbergen, May 27, 1827; left the Hecla there in the ice; sailed, June 21, with two boats, through an open sea; left the boats on the 24th, and began (81° 12′ 51″) his journey over the ice to the north pole. But after thirty-five days' journey over the ice, during which it rained almost all the time, he reached only the latitude of 82° 45′ 15″. The ice was everywhere broken. At length he was compelled to return, as the ice was driven to the south. He had travelled over 292 miles in a right line, and 580 with the necessary windings. The southerly course of the ice facilitated his return. After forty-eight days' passage through the ice, Parry reached (August 12) Table island, and, August 21, after sixty-one days' absence, the Hecla. The dip of the magnetic needle had constantly been towards the north, and the western variation diminished. From the eighty-first degree there was no drift ice, nor birds, nor whales, to be seen, and, with 500 fathoms, no bottom could be found. September 29, 1827, captain Parry and captain Franklin entered the admiralty office within the same half hour.—See Parry's *Narrative of an Attempt to reach the North Pole* (London, 1828).

In the spring of 1829, captain Ross, chiefly through the liberal assistance of Felix Booth, Esq., sheriff of London, undertook a private expedition into the Polar seas, with a view to determine the practicability of a new passage which had been confidently said to exist, particularly by Prince Regent's inlet. In consequence of the loss of the foremast of his vessel (the Victory), and other untoward circumstances, he was obliged to refit at Wideford, in Greenland. The accounts of his departure from thence, on the 27th July, 1829, formed the last authentic intelligence received of the expedition, until the commander and crew were picked up, in August, 1833, by captain R. W. Humphreys, of the Isabella, of Hull, captain Ross's old ship. By captain Ross's account, it appears that the first season—that of 1829—was the mildest that had ever been recorded, and the sea was more clear of ice than had been experienced during any of the former voyages. On the 14th of August, he reached the spot where the Fury's stores were; landed without difficulty, and there he found the provisions, &c., but not the wreck, which had totally disappeared. Having supplied all his wants at this depot, he advanced to the southward round cape Carey, from whence the west coast led him in a south-west direction to the latitude of seventy-two degrees north. Here he was, for the first time, seriously impeded by the ice; but after examining an inlet, he proceeded to urge his way to the southward, as near the west shore as the shallowness of the water would permit, and occasionally landed to take possession of the newly-discovered region for the British crown, with the usual ceremony. Owing to the rapidity of the tides and currents, the stubborn quality of the ice, and the rocky character of the coast, the voyage was perilous in the extreme. Having experienced several almost miraculous escapes from shipwreck, they ultimately succeeded in reaching the 70th deg. of latitude, in a direction nearly due south of Fury point, where their course was arrested by an impenetrable barrier of ponderous ice. In a harbour which they found at this extreme point, they wintered. In January, 1830, they opened a communication with a most interesting tribe of natives, who had never before held intercourse with strangers. Friendship being soon established between the adventurous tars and these primitive people, the first winter, which was not more than commonly severe, was spent very pleasantly. Having learned from the natives that the East sea was divided from the West by a neck of land, this point was examined, and all hope of effecting a passage in that direction completely extinguished. Commander Ross (nephew of captain Ross), who was sent to survey the coast of the West sea, leading to cape Turnagain, succeeded in getting within 150 miles of it, and left off within a short distance of where captain Back expected Fish river to join the sea. They also determined that the land was continuous to that which forms Repulse bay. During the autumn of 1830, the voyagers waited in vain for the ice to dissolve, as it had done the preceding year. Although they used their utmost exertions, they had not succeeded in retracing their course more than four miles, when they were arrested, in a very dreary position, by the approach of a winter unparalleled in severity—the lowest temperature being 92° below the freezing point. The summer proving no less rigorous for the season, little hope was entertained of a release, and a farther progress of fourteen miles was all they could accomplish. In October, 1831, the ship was laid up in harbour, where the party endured the rigours of another winter, not less severe than that of the preceding year. Their provisions being consumed, they had now no alternative but to abandon the vessel, and to proceed to the spot where the Fury's provisions still remained—a direct distance of two hundred miles, which was increased by one-half, in consequence of the circuitous route which the ice obliged them to take. They accordingly left the Victory in May, 1832, and after a journey of uncommon labour and hardship, they reached Fury beach in the month of July. During this journey, they had not only to carry their provisions and sick, but also a supply of fuel; without melting snow, they could not procure even a drink of water. They repaired the Fury's boats, and attempted to escape; but it was September before they reached Leopold's island, which they have fully established to be the north-east point of America. Here they waited with inconceivable anxiety for a disruption of the ice, but in vain. It presented one impenetrable mass, extending across Lancaster sound, and intercepting the progress of the fishing ships, which could advance no farther than Admiralty inlet, where some remained so late as the 17th September in the same year. Winter set in, and no choice was left but to retrace their steps, and spend another inclement season in canvass huts, covered with snow. Their sufferings at this time, aggravated by want of beds, clothing, and animal food were of the most acute description. The spring and summer of 1833 afforded the desolate party more cheering hopes. The ice opened on the 14th of August, and on the same day that captain Humphreys, in the Isabella, tried to reach Leopold's island, they arrived there. The former could not cross the ice, and was driven by a north-west gale to the southward, up Prince Regent's inlet. The party remained until the gale had departed; and having crossed when the Isabella was to the southward, they passed to the northward of her, and having gained the south shore of Lancaster sound, they nearly reached its entrance before the Isabella overtook them. It is impossible for any description to do justice to the feelings of either side on meeting. None but those who have been in a similar situation, can form any idea of what passed in the minds of men rescued from such misery by the hand of Divine providence; nor can the feelings of him who has been selected as the instrument of mercy, be fully appreciated. The party were not more reduced by their sufferings than might have been expected. The circumstance that captain Ross was rescued by the ship he commanded in 1818, cannot fail to be considered an extraordinary, as well as a happy conclusion of the voyage, the result of which was, as far as the endeavours of the explorers were directed, of the most conclusive nature, namely, establishing that there is no new passage south of 74° north. The country discovered, which is larger than Great Britain, was named Boothea, after Mr Booth, who acted as a truly patriotic and public spirited citizen, by assisting captain Ross, when fitting out the expedition. The true position of the magnetic pole was discovered, and much valuable information obtained for the improvement of geographical and philosophical knowledge. Captain Ross had a good opportunity of verifying his former survey of the west coast of Baffin's bay, which every master of a Greenland ship can testify is the most correct. Only three men died during the voyage, two of whom were men whose constitutions were unfit for the climate. Captain Ross arrived at Hull on the 18th October, 1833, after an absence of upwards of four years, and his arrival excited a very general expression of satisfaction throughout the kingdom. Before news of his safety reached this country, public subscriptions were raised for fitting out an expedition to go in search of the gallant captain and his crew. Towards this expedition the treasury contributed liberally; and captain Back, whose experience eminently qualified him for the service, was appointed to conduct it. He sailed in the spring of 1833; but news of captain Ross's return reached him in time to prevent him from encountering any inconvenience in his proposed search for that individual. He, however, visited the great Fish river, and examined its course to the Polar seas; and after a perilous Arctic land journey, he arrived at Liverpool, in the packet ship, North America, on the 8th September, 1835.

If the antipolists, or opponents of Barrow, at the head of whom Leslie was, who ascribe the breaking up of the ice on the coast of Greenland to the accidental prevalence of warm winds, and infer, from physical principles, the impossibility of penetrating the ice of the polar seas, are correct in their views, yet these bold expeditions have been rich in scientific results; they have determined the outlines of the northern coast of America, and of the western coast of Greenland, and made known the depth, temperature, saltness, and specific gravity of the polar seas, the rate and direction of the currents, and the state of the atmospheric electricity, and its connexion with the variation and power of the magnetic needle in the Arctic regions. The whole enterprise is a monument of perseverance, hardiness, and courage, as well as of intelligence and skill, highly honourable to the British nation.

The expeditions directed by the Russian government, in part at the expense of the count Rumjanzoff, have had for their object the examination of the coasts of Kamschatka and the north-west coast of North America, or that of the north coast of Asia and Nova Zembla. Captain Kotzebue, on his first expedition (1814—1818), discovered the sound called by his name, to the north of Beering's straits, and, in 1824, undertook a new voyage round the world, in which it was intended that he should penetrate beyond the Icy cape, which had been discovered by Cook; but the ice obliged him to return, and he arrived at Cronstadt in 1826. The Narratives of these two voyages have been published in English.

The polar expedition of baron Wrangel, whose companions were lieutenant Anjou, doctor Kober, and some seamen, started from Siberia in April, 1820. Here, and upon the ice of the Polar ocean, they struggled for four years with cold and hunger, as they could take with them but a small supply of provision in their sledges drawn by dogs. After passing forty-six days upon the surface of the Frozen ocean (at a temperature of from 2° to 22°), they reached, in their sledges, the latitude of 72° 3′. Wrangel surveyed astronomically the whole coast from cape Schalagskoi to Beering's straits, to the point seen by Billings, 438 geographical miles southeast from Cook's North cape, and the hitherto unknown northern coast of Siberia, and placed beyond doubt the existence of an open passage between Asia and America. He returned to Petersburg in May.

A third expedition was fitted out for Beering's straits and the Polar seas, under captain Wassiljeff, who sailed from Cronstadt in June, 1819, with two sloops. Captain Wassiljeff discovered an island inhabited by the Aleutians, in 50° 59′ 57″ N. lat., and 193° 17′ 2″ W. lon. Thence he sailed to 71° 7′ N. lat., 19 minutes farther than Cook had gone before him, and discovered two capes upon the northwest coast of North America, which he named *Golownin* and *Ricord*. The other vessel of this expedition sailed along the eastern coast of Siberia, but was compelled to put back, in 69° 10′, on account of the ice. Late in the summer of 1822, both ships returned to Cronstadt.

To survey the yet unexplored coasts of the island of Nova Zembla, the Russian government sent lieutenant Lasareff in 1819, lieutenant Lawroff in 1821, and the lieutenant-captain Litke in 1822. The last added much to our knowledge of Nova Zembla, and of the coast of Lapland. A new expedition was intrusted to him in 1823, for the examination of Waygatz island; and he was also instructed to make charts of its coasts, as well as the other coasts of these northern regions, of the island Werdhuus, and of Waranger bay. He returned to Archangel August 31, 1823.

Another Russian ship, the Neptune, which, according to Krusenstern, reached (1817) 83° 20′ N. lat., found no indications of a country lying north of Spitzbergen; and this result has been confirmed by Parry's last expedition. The Russians have, however, proved that Asia is not connected with America on the north. See *North America*.

A compendious view of the attempts to explore the polar regions is given in the Narrative of Discovery and Adventure in the Polar sea and Regions, by professors Leslie, Jamieson, and Murray, published at Edinburgh by Oliver and Boyd.

NORTH POLE. See *Pole*.

NORTH POLE in Magnetism. See *Magnetism*.

NORTH RIVER. See *Hudson River*.

NORTH SEA (anciently *Mori-marusa*); a name given to that part of the Atlantic situated to the north of England and Ireland, sometimes also to the *German ocean* or that part of the Atlantic which is north of the Downs and the mouth of the Thames. This term has likewise been applied to the gulf of Mexico, and all that part of the Atlantic which is north of the coast of South America, from the isthmus of Darien.

NORTH STAR. See *Pole Star*.

NORTHUMBERLAND; the northernmost county of England, is bounded on the north by Scotland, and a detached portion of the county of Durham, east by the German ocean, south by Durham and Cumberland, and west by Cumberland and Scotland. It forms an irregular triangle, extending about sixty-five miles from north to south, and about forty-eight from east to west. The county is included in the northern circuit, in the diocese of Durham, and the province of York. Under the Romans, it formed part of the province of Valentia, which extended from Tynemouth to the firth of Forth. During the Saxon period, it was included in the kingdom of Northumbria or North-Humber-Land, which extended northward to the firth of Forth, and southward to the Humber, whence its name; comprehending, besides this county, Yorkshire, Durham, Lancashire, Westmoreland, and Cumberland. From the reign of Stephen till the union of the crowns of England and Scotland, it formed the great theatre of the border wars.

Northumberland, which is one of the largest counties in England, presents a great variety of soil and surface; for though some parts are fertile and well cultivated, the greater portion approaches to the state of absolute barrenness. In the north-west are the Cheviot hills, where the land, though unfit for the plough, affords good pasturage for sheep. Other mountainous districts extend from the south-west angle of the county and the borders of Durham to the moors north of Rothbury. On the eastern side of the county are some fertile tracts, consisting of valleys through which the rivers take their course to the sea; and among these the vale of the Coquet is remarkable for its fertility. Along the sea-coast the surface is generally level, and there are several small bays, or inlets, but no harbour of importance, except that of North Shields at the mouth of the Tyne. The headlands of Bainbrough and Dunstanbrough are two promontories remarkable for their castles; and off the coast are the groups called Farn Staple islands, as well as the larger island of Lindisfarn. Southward of these is Coquet island, at the mouth of the river of the same name. The principal river of Northumberland is the Tyne, formed by two branches; the North Tyne, which rises in the Cheviot hills on the Scottish border; and the South Tyne, which has its source at Aldstone moor in Cumberland; and these uniting near Hexham, flow westward by Newcastle and Shields to the sea at Tynemouth. The Reed, which rises at Carter Fell, among the Cheviot hills not far from the source of North Tyne, falls into that river at Bellingham. The Coquet, which has its origin in the same mountain range, crosses the county from west to east, and enters the sea at Warkworth. The Tweed, a Scottish river, skirts the northern border of this county; and, besides these, may be specified the Blyth, the Wansbeck, and the Alne, which all fall into the German ocean.

The climate of Northumberland is extremely various, but on the whole by no means so cold as might be expected from its northern situation; the temperature of the air being moderated by the sea-breezes which reach it from the Irish channel as well as from the German ocean, and hence the snow seldom lies long except on the tops of the highest hills.

Northumberland is chiefly distinguished for its mineral treasures, especially coal and lead-ore. The great coal-field of this district is partly in this county and partly in that of Durham. The coal-measures and rocky strata, which together constitute the coal formation of Northumberland and Durham, are in part covered by magnesia, limestone, and rest upon lead mine measures. They occupy a hollow, or basin, the extreme length of which, from Acklington colliery, near the Coquet river, on the north, to Cockfield, near West Auckland in Durham, is fifty-eight miles; and the breadth, from Bywell-on-the-Tyne, westward, to the sea-shore, is twenty-four miles. This tract is characterized by low-topped hills, which rise gradually on advancing from the coast towards the interior. Ores of iron and lead, and calcarious spar, accompany the coal measures; with which also are found organic remains of vegetables, as impressions of ferns, mineralised cones, stalks of trees, &c., and bivalve fresh water shells, but no marine relics. The quantity of coal raised annually in this district is immense. It is exported chiefly from the ports of Shields, Newcastle, and Sunderland, to London and the entire eastern coast of England; the vessels by the Tyne river being the largest, chiefly proceed to London, and those by the Wear, which are smaller, to the towns on the coast. The lead-mine measures form the northern and western boundaries of the coal-field. This formation enters Northumberland from the north side of the Tweed, and in a south-eastern direction it follows the coast from Berwick to the Coquet, for thirty-two miles. The porphyritic mountains of Cheviot interrupt it towards the west for about twenty miles; but, having passed the southern part of that ridge, it stretches across the whole breadth of Northumberland, and is spread over the adjacent borders of Cumberland, Westmoreland, Durham, and Yorkshire. From the lead-ore silver is likewise sometimes extracted in considerable quantities. Ores of zinc and iron are found in many parts of the county; and limestone is of common occurrence.

The principal products of Northumberland, besides minerals, are corn, cattle, sheep, wool, and fish, particularly trout and salmon; the latter, procured in abundance from the fisheries on the Tweed, furnish, when dried or pickled, an important article for exportation. The chief manufactures are such as derive advantage from the collieries, and hence there are extensive glass-works, potteries, and iron founderies.

The six wards in this county are those of Bamborough, Coquetdale, Glendale, Morpeth, Tindale, and Castle Ward. The boroughs are Newcastle, Morpeth, and Berwick; the market-towns are Allerdale, Alnwick, Belford, Bellingham, Blyth, Corbridge, Holtwhistle, Hexham, Rothbury, North Shields, Warkworth, and Wooller; but Blyth, though it is become a place of importance on account of the coal-trade, has not a regularly chartered market; that of Corbridge is discontinued; and the market of Warkworth is inconsiderable. Population of the county in 1831, 222,912.

NORTHUMBERLAND, Duke of. See *Dudley*.

NORTH-WEST COAST OF NORTH AMERICA. This part of the world has been for some time the scene of an active commerce in furs with China. Cook examined this coast on his third voyage. On the arrival of the expedition in China, the sailors disposed of the sea-otter skins which they had obtained, at what seemed to them enormous prices, and it was immediately perceived that this newly discovered branch of trade would be extremely lucrative. Several voyages were accordingly made for carrying on this traffic as early as 1784; and in 1787 two vessels were fitted out from Boston for this destination. In a few years, the trade was almost entirely in the hands of the Americans; and in 1801, out of sixteen ships on the coast, fifteen were American, which collected 18,000 sea-otter skins, besides other furs, for the China market. In 1822, there were fourteen vessels from the United States engaged in this trade, combined with that from the Sandwich islands, in sandalwood. These vessels are from two to four hundred tons burthen, and carry from twenty-five to thirty men; they are about three years in completing a voyage. After exchanging with the natives of the coast for furs, such part of their cargoes as is adapted to the wants or fancy of the people (such as blankets, cloths, coarse cottons, arms and ammunition, cutlery and iron-ware, beads, rice, molasses, rum, &c. &c.), they proceed to the Sandwich islands, where they obtain a cargo of sandal-wood, which, with the furs, they carry to Canton, and dispose of for teas, &c. In 1821, the value of the articles thus sold in Canton was nearly half a million of dollars; and the value in the United States of the articles purchased there, was about a million of dollars. The trade has, however, declined since that period, in consequence of the most valuable article (the sea-otter's skin) having, since the commencement of the present century, become gradually so scarce, that last season not more than 300 were collected on the whole extent of coast where 18,000 were obtained in 1801. In 1821, an attempt was made on the part of Russia to secure the monopoly of this fur-trade, by prohibiting all foreign vessels from approaching within 100 miles of the coasts north of 51° on the American side, below which the fur-trade is worth nothing. By the convention of 1824, between Russia and the United States, this claim was abandoned by the former, and it was agreed that each party might trade on the coasts of the other under certain restrictions. About 1812 a settlement was made by citizens of the United States, near the entrance of the Columbia, or Oregon river, which was taken possession of by the British in 1814, and restored after the peace of 1815. By treaty between the United States and Great Britain, this river and the whole coast are free to both parties; but the British fur company has, in fact, a monopoly of the fur-trade to the westward of the Rocky mountains, except to a small extent on the sea-coast. They have many posts on the several branches of the Columbia, and it has been announced, that they are about forming an establishment on the borders of Observatory inlet, in lat. 56° north. The Russians have given notice of their intention to abandon their principal settlements at Norfolk sound or New Archangel, and remove the settlers to Kodiack.

NORTH-WESTERN PASSAGE. See *North Polar Expeditions.*

NORTH-WEST FUR COMPANY. See *Fur-Trade.*

NORTH-WEST POINT; a cape on the west coast of Africa; lat. 16° 36' S.

NORTH-WEST TERRITORY, the name bestowed on a tract of country in America, situated between 42° 30' and 49° N. lat., and 87° 30' and 95° 30' W. lon. It is bounded on the north by the British possessions, east by lake Michigan, south by Illinois, and west by the Mississippi, and a line drawn from the source of this river to the northern boundary. It is about 500 miles in length, and 400 in breadth. It is generally a hilly country, with the exception of extensive prairies. At the western extremity of lake Superior are the Cabotian mountains; and near the mineral district are the Smoky mountains. In some of its features this country resembles Missouri territory; but a greater portion of it is covered with wood. The chief rivers, except the Mississippi, are Ouisconsin, Fox, Chippeway, St Croix, Rum, St Francis, and Savanna, flowing into the Mississippi; Grand Portage, Ontonagon, Montreal, Mauvaise, Bois Brulé, St Louis, and nearly fifty smaller streams, flowing into lake Superior. Fox river flows into Green bay; Rivière la Pluie falls into the lake of the Woods None of the lake rivers are more than 150 miles long, and few more than fifty miles. The largest branch of the Mississippi in this territory is the Ouisconsin, which rises in the northern interior of the country, and interlocks with the Montreal of lake Superior. It has a course of between three and four hundred miles, has a shallow and rapid current, but is generally navigable for boats in good stages of the water, and is 800 yards wide at its mouth. There is a portage of only half a mile between this and Fox river, which flows into Green bay of lake Michigan. This portage is over a level prairie, across which, from river to river, there is a water communication for pirogues in high stages of the water. Fox river has a course of 260 miles, and runs through Winnebago lake. It has a fine country on its banks, with a salubrious climate. Chippeway is a considerable river, and enters the Mississippi just below lake Pepin. It is half a mile wide at its mouth, and has communication by a short portage with lake Superior. This is a fine region for hunters. In the upper part of the country, buffaloes, elk, bears, and deer, are common. Beavers, otters, and musk-rats, are taken for their furs. The trappers and savages roam over immense prairies in pursuit of their game. In some parts of it the soil is fertile. White and yellow pine, and canoe birch, are common among the forest trees. All the water-courses, ponds, and marshes, are covered with wild rice, which constitutes a considerable part of the food of the inhabitants. The head waters of the Mississippi are estimated at 1330 feet above the level of the sea. It is a country abounding in minerals. There are great quantities of *terre verte*, or green earth, lead, copper, and iron. The lead-mine district is in the lower part of the country, between Rock river and the Ouisconsin. Here, on a river called *Fever* river, are the chief establishments of the present miners, and the mines are probably as rich and abundant as any in the world. Great quantities of native copper have been supposed to exist on the shores of lake Superior; but recent and intelligent travellers have not confirmed the expectations which had been raised by common report. There are, however, sufficient indications of the existence of mines of copper; and lead and iron are found in many places. The southern parts of this extensive country possess a climate comparatively mild, and resembling that of the northern belt of Missouri. At the falls of St Anthony the summers are temperate, and the winters extremely cold. At St Peter's, in 1820, the mean temperature of Germany was zero—a degree of cold not felt in any part of the United States that is much settled. At the falls of Packagama on the Mississippi, about 1200 feet above the sea, water has been known to freeze considerably on the 19th of July. The inhabitants of the north-west territory are under the jurisdiction of the government of Michigan. The country is divided into four counties, or rather only four counties are set off, named and inhabited by whites; viz. Brown, containing, in 1830, 964 inhabitants; Chippewa, 625; Crawford, 692; Iowa, 1589. The principal towns or villages are Sault de Ste. Marie, on the south bank of St Mary's river, containing 356 inhabitants; and Prairie du Chien, on the Mississippi, three miles above the junction of the Ouisconsin, containing 598 inhabitants. Most of the lands of this region are owned by the Indians, or are claimed by the United States. See Long's *Second Expedition*, and Flint's *Geography*.

NORTON, THOMAS; a dramatic writer of the sixteenth century, a native of Sharpenhoe, Bedfordshire, principally known as the author of the three first acts of Ferrex and Porrex, to which Thomas Sackville, earl of Dorset, added the fourth and fifth, and published the whole under the title of *Gorboduc*. He also put into metre twenty-seven of the Psalms in Sternhold and Hopkin's version. His death took place about 1584.

NORWAY (Swedish *Norrige*, Danish *Norge*, pronounced *Norre*), the proper native country of the Normans (q. v.), a kingdom of the Scandinavian peninsula, is bounded to the west and north by the Northern Atlantic ocean, to the east by Russia and Sweden, to the south by Sweden and the Cattegat. The history of the earliest and the middle ages of Norway consists in legends contained in the *Heimskringla*, which is for Norway what the *Edda* is for Iceland.—See the magnificent edition of the *Heimskringla* (Copenhagen, 3 vols. fol., with a Latin and Danish translation). Little is known of the history of Norway before the end of the tenth century, when the Christian religion was established there by Olaf I. not without violence. Olaf II. continued this forced conversion (1020), and made religion the means of suppressing several petty princes who had a share in the government. Canute the Great, king of Denmark, conquered Norway (1028), but did not long retain possession of it; and the country had its own monarchs again from 1034, who even for a time governed in Denmark. When, with Hakon VII., the male line of Norwegian kings became extinct, the estates elected the young Swedish king, Magnus VIII., Hakon's nephew, to rule over them. His grandson, Olaf IV., was elected to the throne of Denmark in 1376, and on the death of his father in 1380, governed both countries together; and leaving no children at his death, his mother, Margaret (q. v.), daughter of Waldemar III., king of Denmark, inherited both thrones; from which time forward Denmark and Norway remained united; but yet the latter, with some interruptions at a later period, retained its own constitution. This union of both countries continued till 1814. In 1812, some of the allied powers promised Sweden the kingdom of Norway if she would unite with them against France. Norway was to be taken from the Danes, who were allies of France. After the battle of Leipsic (October, 1813), the crown-prince of Sweden with his army proceeded towards Denmark, and, after some bloody scenes in Holstein, peace was concluded at Kiel (14th January, 1814), in which Denmark ceded the kingdom of Norway to Sweden. But the Danish prince Christian, governor of Norway, had been chosen independent sovereign of Norway by the estates of that country, who would not acknowledge the cession which Denmark had made of Norway to Sweden at the peace of Kiel. The crown-prince of Sweden, therefore, entered Norway (July, 1814), and, after several battles of not much importance, the country submitted to the Swedes, not without suspicion of a secret understanding, although the people had solemnly sworn in all the churches, some months previously, to lay down their lives for independence. After this an armistice and a convention were concluded at Moss (August 14, 1814), according to which Norway was to be united to Sweden, but as an independent kingdom, and with a separate constitution. The constitution which had been formed (May 17, 1814) for Norway, by the diet (*Storthing*) assembled at Eidswold, was accepted by the king of Sweden. It is true that disturbances arose in some parts of Norway, but they were without effect; and the *Storthing*, assembled at Christiania, decided upon the union of Norway with Sweden, October 20, 1814. According to the constitution formed November 4, 1814, with a few alterations, Norway remains a free kingdom, independent and undivided. On the Norwegian coins the royal title is altered, so that Norway is named before Sweden. A viceroy or governor is to reside at Christiania, and the nation is to be represented at Stockholm, by a deputation of three Norwegians. Only the crown-prince or his eldest son can be viceroy. A Norwegian or Swede may be appointed governor. The king has the executive power; the *Storthing*, which consists of the delegates of the nation, who deliberate and vote in two chambers, called the *Odelsthing* and *Logthing* (q. v.), the legislative.

Norway has a population of 1,050,132, on a superficial area of 122,960 square miles. The severity of the climate is the cause of the thinness of the population: in the eastern part it is excessively cold; on the coast it is somewhat milder. The air is healthy, and the heat in summer very great, but of short continuance. The country every where contains numerous morasses, forests, and barren tracts. A branch of the Kjœlen mountains, under the name of the *Doffrefield*, divides Norway into northern and southern. The indented coast (from North cape, 71° 10′, to Lindesnes) is lined with islands and islets. Some parts of the country are favourable to pasturage, but sufficient corn is not raised for the wants of the inhabitants, and in the north part of the kingdom a great number of the inhabitants live on dried fish, and bread, made, in part at least, of the bark of the pine (*pinus silvestris*). The chief article of commerce is ship-timber, exported principally to Britain. Other articles of export are iron, copper, pitch, resin, salt, butter, furs, potash, and dried fish, particularly herring. The present condition of Norway is by no means flourishing. The productions of the country are in less demand than formerly, and the commerce has very much declined, particularly the lucrative trade to the Mediterranean. The mines are for the most part neglected, and iron is even imported from Sweden. The revenue in 1826 was 1,900,000 dollars; the expenditure 1,800,000. Measures are taken for the extinction of the public debt, which amounts to 3,500,000 dollars, exclusive of the bank paper. The land force is fixed at 12,000 men; but in peace only 2000 are kept on foot. The navy in 1821 was composed of two frigates, six brigs, and eight schooners. The inhabitants are Norwegians and Finns, and of the Lutheran religion. Their language closely resembles the Danish. The people are ingenious, industrious, frugal, honest, and hospitable, passionately attached to freedom and their native country. The nation is composed of the nobles (the further continuance of nobility was, however, abolished by the *Storthing* in 1821), the clergy, citizens, and peasants. The country is divided into two counties and sixteen villages, or into five bishoprics and four dioceses—Aggerhgus (containing the capital, Christiania), Christiansand, Bergen, and Drontheim (in which the city of Drontheim belongs to the diocese of Drontheim), and Nordland with Finmark (Norwegian Lapland). The Norwegian literature is almost entirely composed of periodical works, and works of local interest. There are, however, some modern poets of Norway; among which are Zettlitz (died 1821), Olsen, and Harsen. The periodical *Saga* is devoted to the old northern languages. See *Sweden*.

NORWICH; a large, populous, and ancient city of England, the metropolis of the county of Norfolk, is situated 108 miles N. E. by N. from London, on the river Wensum, which is navigable up to the town, and over which it has no fewer than nine bridges, three of them of iron. It had formerly an embattled wall, with twelve gates, and flanked by forty towers, some remains of which are yet to be seen. The castle stands in the centre of the town, and was first erected in the sixth century, by the Saxons. The keep, a principal tower, is the only considerable part of the building which now remains. The cathedral is one of the oldest in England, the building having been commenced by Herbert, the first bishop, in 1096; and it was completed by William Middleton, who presided here in 1284. The church originally consisted of a choir, a tower, and transept, with north and south aisles; the nave and its aisles were erected by bishop Eberhard: and the building having been damaged by an accidental fire in 1171, it was repaired, fitted up, and ornamented by bishop John of Oxford about 1197. The chapel of the Virgin Mary was added by Walter de Suffield, the tenth prelate. It is a cruciform edifice, chiefly of Norman architecture, though the later portions display some of the characteristics of the Gothic style. From the centre rises a noble tower, crowned with battlements and angular pinnacles, and surmounted by a lofty spire, the upper part of which having been blown down in 1629, it was rebuilt in 1633. The entire length of the cathedral, from west to east, is 411 feet; from the western door to the entrance of the choir 230 feet; length of the choir 165 feet; thence to the entrance of St Mary's chapel thirty-six feet; length of the transept 191 feet, and breadth seventy-one feet; height of the tower and spire 315 feet. At the east end of the choir are four windows ornamented with stained glass, displaying the transfiguration of Christ, and figures of the prophets, apostles, and evangelists. The choir was formerly surrounded by chantry chapels, of which there are several still remaining. On the southern side of the choir are the cloisters, forming the largest quadrangle of the kind in England, extending 170 feet on each side. They were erected by Robert of Walpole, bishop of Norwich, in 1297; and they have a fine stone roof ornamented with sculpture representing scenes from Scripture history. Northward of the cathedral stands the episcopal palace, built about 1320, by bishop Salmon.

Norwich was early famed for its woollen manufactures, introduced by a colony of Flemings, who settled in the neighbouring town of *Worsted* (a name familiar from the useful article first produced in it), in the reign of Henry I. Other settlers from the same country joined their brethren in the reigns of Henry VI. and of Elizabeth; and numerous articles, framed from mixed silk and woollen, became marketable from Norwich throughout Europe. The staple articles are bombasines, worsted damasks, flowered satins, and fine camlets. To these articles have been recently added the manufacture of cottons, shawls, and other fancy goods, both for furniture and dress. The manufacture of cotton thread lace has also been introduced; and the trade in linen, called Suffolk hempen, is in a flourishing state. In 1810, mills for throwing silk on an extensive scale were erected, and this manufacture employs 1000 persons. The commerce of the city is chiefly transacted at the port of Yarmouth, thirty-two miles distant. Population, in 1811, 37,256; in 1821, 50,288; in 1831, 61,110.

NORWICH; a city of the United States of America, in New London county, Connecticut, on the Thames, at the head of navigation, thirteen miles north from New London; lat. 41° 33′ north; lon. 72° 7′ west; population in 1831, including the township, 5109. The falls of the river at this place afford extensive water power, and there are considerable manufactures.

NOSAIRIANS, NASSARIANS, or ANSARIANS; a Mohammedan sect of the Shiite party, which was formed in the 270th year of the Hegira, and received its name from Nasar, in the environs of Koufa, the birthplace of its founder. At the time of the crusades the Nassarians had spread widely in Syria and Mesopotamia, and rivalled the Ishmaelites in power. They were afterwards confined, by the victories of the Turks, to a strip of mount Lebanon, in Syria, on the Semmack, which they now occupy as tributary to the Turks, though in other respects as an independent nation. Their chief town, Sasita, eight leagues from Tripoli (Tarablus), is an old fortress, with a village of 250 houses, and the residence of their lay scheik, who governs them as hereditary prince and vassal of the Porte. The district of 800 villages, in which the principal part of their population resides, under the governments of Tripoli, Damascus, and Hamah, is not very fertile, but produces grain, garden fruits, figs, mulberry-trees, oranges, and wine, which they allow themselves to drink. They also raise cotton, silk, gall-nuts, madder, and other drugs, in which they carry on a profitable trade. Their manners are rude, and corrupted by remains of heathenish customs, which remind us of the Lingam worship. Although polygamy is not allowed, yet on certain festival days they permit the promiscuous intercourse of the sexes, and are divided, after the manner of the Hindoos, into numerous castes, which oppress one another. The Turks, to whom they make a firm opposition, and the Ishmaelites, their nearest neighbours, detest them, although they differ slightly from the latter in their religious views. They are, like them, worshippers of Ali, believe in the transmigration of souls, but not in a heaven or hell. They are friendly to Christians, and observe Christian festivals and ceremonies, but without understanding their meaning. They, moreover, exhibit, in their worship of God, many traces of the worship of nature of some of the old Asiatic nations. Certain animals and plants are sacred with them, and the secret parts of females, as an emblem of the principle of generation, is an object of their worship. They have many places of pilgrimage and chapels in common with the Turks, in which their worship is exercised with great formality. A spiritual head, Scheik Khalil, directs their religious concerns, and wanders around among them as a prophet. The formerly current opinion, that the Nassarians were Syrian Sabians, or Christians of St John, has been completely exploded by Niebuhr, and the accounts of Rousseau, the French consul at Aleppo.

NOSE (*næse*, *nosa*, Saxon); that prominence on the face, which is the organ of scent and the emunctory of the brain. The ancients seem to have had an aversion to small noses, and the Romans esteemed above all the aquiline nose, which Pliny termed, by way of distinction, *royal*. It is thus that Ælian has described that of Aspasia, and Philostratus those of Achilles and of Paris. According to Plutarch, Cyrus had the same; and on this account the Persians are said to have admired noses of this shape. But aquiline noses were reckoned beautiful only when the curve was gentle and almost insensible, in contradistinction to such as are decidedly crooked, resembling the beak of a parrot. The Grecians, indeed, generally speaking, seem to have held a straight line from the forehead, or rather slightly inclined, to be the *beau idéal* with respect to this feature; and accordingly we find it in their best statues, &c. They, however, participated in the dislike to small and unobtrusive noses; and probably one cause for this is to be found in the fact of their making the expression of indignation and anger lie chiefly in the nose and nostrils. It may be remarked, in confirmation of the above observations, that the short nose is never to be found in Roman sculpture earlier than the times of Caracalla, when the art evidently declined, as is obvious, among other proofs, from the introduction of so bad a taste as working in variegated marbles.

NOSOLOGY (from the Geeek, νοσος, disease, and λογος), in medicine; that science which treats of the systematic arrangement and classification of diseases.

NOSSA. See *Northern Mythology.*

NOSTRADAMUS; a celebrated empiric of the sixteenth century, born in December, 1503, at St Remy, in Provence. After studying at Avignon and Montpellier, he practised medicine at Agen, Marseilles, Lyons, and Aix. He pretended to foretell future events, and published a volume of obscure metrical rhapsodies in 1555, under the title of Prophetical Centuries. Henry II. and Catharine de' Medici yielded implicit credence to his pretensions, and loaded him with favours; Charles IX. himself came in person to Salon, for the purpose of visiting him, and appointed him his first physician. He died July 2, 1566. There is an English translation of his book in one folio volume.

NOTABLES (*les notables*) signifies, literally, the most important men in a state. In France, where alone this expression was usual, it signified the deputies of the states who were appointed and convoked by the king. In the early history of that country, mention is several times made of the notables; but the first assembly of any importance was in 1558. From 1626 no such assembly was again called, till, in 1786, the minister and controller-general Calonne conceived the idea of summoning the notables for the purpose of effecting several arrangements, which he considered necessary; and there were accordingly assembled, by an *ordonnance* dated December 29, 1786, seven princes of the blood, nine dukes and peers of France, eight field-marshals, twenty-two noblemen, eight counsellers of state, four masters of requests (*maîtres des requêtes*), eleven archbishops, thirty-seven chief justices, twelve deputies of the *pays-d'états*, the civil lieutenant, and twenty-five magistrates of the different cities of the kingdom, making in all 144 persons. After this assembly had continued its sessions from February 22, to May 25, 1787, it separated, and the following results of their labours were published: 1. The provincial assemblies were established according to a plan proposed by the notables; 2. the council of finance was organized as they wished, and was to publish annual reports of the receipts and expenditures, and also of the pardons and pensions; 3. the abolition of the *corvées*; 4. the abolition of the tolls and other obstacles to a free passage through the interior; 5. the abolition of the salt tax, which was to take place by degrees, as the revenue was improved by retrenchments, &c.; 6. freedom of the corn trade, and of the internal trade in general; 7. careful improvement in all departments, and a yearly retrenchment of at least four millions; 8. retrenchment in the household of the queen and princes; 9. a yearly loan of fifty million livres; 10. a yearly tax of fifty millions upon such articles as would render it least burdensome to the people; 11. the provincial assemblies were not to consent to the imposition of any new tax till the retrenchment should amount to forty millions. This assembly forms an epoch in the modern history of France. A second meeting of the notables was called in November, 1788, to consult on the manner of assembling the states-general.

NOTARY (Latin *notarius*, from *nota*, mark) originally denoted, with the Romans, those slaves or freedmen who acted as stenographers (making use of certain abbreviations, signs, *notæ*), particularly in the meetings of the senate. In later times, the *notarii* were the secretaries of public authorities. From the Romans the name passed over to the nations of Western Europe; and in modern times a *notary* is a witness, appointed as such by government, whose testimony is in some cases useful, to give credibility to instruments; in other cases is required by law, to give them full validity, as, for instance, in protests of bills of exchange, &c. In England, the importance of notaries is comparatively small: in Germany, the emperor, while the empire existed, appointed the *notarius publicus sanctæ Cæsareæ majestatis*; and, as the administration of each country belonging to the empire strove to limit, as much as possible, the influence of the emperor, the importance of the imperial notaries was small. When the empire was dissolved, every government, of course, appointed its own notaries, which formerly was a privilege of the emperor or his vicars. In France, the importance of the notary was, and still is, greater than any where else. It was so before the revolution; and he has retained his importance in the new administration of justice. He is not only a public witness for every one who wishes his testimony, but he is also the great witness of government, or the political society. He makes all contracts, mortgages, and other deeds and conveyances, where the property in question amounts to more than 150 francs. The instruments of a notary have full authority, and no testimony against them is permitted. The notary keeps a strict register of all his legal acts, and, for the preservation of the same, is responsible to the public. A party to a contract finds the original of his instrument with him, in case he has lost his copy. The notaries also perform an important part in the division of inheritances, make the inventories, direct the business, and make a report of what has been done. The notaries in the district of a court of the first instance form a body, which chooses a board (*chambre des notaires*), consisting of from one to nine members (in Paris of nineteen), a president, a syndic, a reporter, a secretary, and a treasurer. This board manages the affairs of the body, and adjusts also all disputes of third persons with notaries respecting their official business and fees. See *Dictionnaire du Notariat* (Paris, from 1822 to 1824, 4 vols.).

In England, a *notary public* is a person who publicly attests deeds, or writings, to make them authentic in another country; but he principally acts in business relating to commerce; makes protests of bills of exchange which are not accepted or not paid; attests the statements of masters of ships, in regard to the damage which their vessels have suffered, &c.

NOTATION, in arithmetic, is the method of expressing, by means of certain signs, any proposed number or quantity. In the modern analysis, *notation* implies a method of representing any operation belonging to this science; and the judicious and ingenious selection of proper symbols forms not the least important part of it. The success of a great mathematical operation depends much upon this point, and the science itself has sometimes made a new advance by the invention of new and more manageable symbols. In the common scale of notation, every number is expressed by the ten characters 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, the nine first of which represent different numbers of units, and denote various values, according to the place which they occupy, and according to the following scheme:—

&c.	Tens of Millions	Millions	Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Units
	·	·	·	·	·	·	·	·

so that, beginning at the right, a character standing in the first place signifies units; in the second, tens;

and so on; so that each character signifies ten times more, according as it stands a place farther to the left. If 7 stands in the place of the units, it signifies 7 units; if it stands in the place of the ten-thousands, it signifies 7 times ten thousand. To determine the place of a character, zeros are made to the right of it: thus, to express seventy thousand, we write 70,000, which shows that 7 stands in the fifth place, which is that of the ten-thousands. The system proceeds still farther: if we have to express seventy thousand one hundred and thirty-four, we do not write 70,000, and 100, and 30, and 4, but 70,134. Place the above numbers one under the other, and the reason is obvious:

70000
100
30
4

It appears that it is unnecessary to retain three of the zeros to the right of 70,000, the two zeros to the right of 100, and the zero to the right of 30, because, if we leave them out, thus,

70
1
3
4

and write the remaining figures all in one line, thus, 70,134, each character will have the same place as it had when each number was written out full, and therefore will have its due value. In order to give a number its proper position, a zero is written wherever no number is to be expressed in one of the other places, as in the above case, the zero to the right of 7, without which the 7 would have denoted seven thousands, not seventy thousands. This is the system of notation of whole numbers, and the mode of expressing fractions differs only in this, that they are numbered from left to right.

· Thousands · Hundreds · Tens | · Units | · Tenths · Hundredths · Thousandths · Ten-Thousandths, &c.

(See *Decimal Fractions*.) The decimal system, so simple and perfect, is one of the most striking of human inventions, and few things have had a greater influence upon the progress of science and civilization. Little do we dream of the enormous difficulty of calculations with the Roman and Greek notation, and the obstacles which it must have thrown in the way of every art, science, or occupation requiring arithmetical operations. The commerce or the navigation of the present day could hardly have been carried on under such systems, and the general habit of keeping regular accounts, which so greatly facilitates the business of life, and tends so much to preserve the good order and peace of society, could hardly have grown up. The origin of this invention, as of many which have exerted the greatest influence on society, is veiled in obscurity. (For a few historical remarks on the introduction of ciphers, see the article *Ciphers*.) As in our decimal system every possible number is expressed by ten characters, so we can imagine a *dyadic* or *binarian* system, of which two is the fundamental number, and which, to express analogously every possible number, would require but two characters (say 1 and 0), one being represented by 1, two by 10, three by 11, four by 100, five by 101, six by 110, seven by 111, eight by 1000, nine by 1001, and so on. Leibnitz first developed such a system in his *Dyadics*. In the same way we can compose systems of three, four, or any given number of characters; and as 12 is a more convenient number for division and subdivision, we knew a German professor of mathematics, who, having invented for himself two more characters for 11 and 12, and given them names, made a *dodecadic* system, by which he performed the most rapid calculations: 12 was the basis of his system, as 10 is of ours, and each character signified 12 times more than its neighbour to the right, and 12 times less than its neighbour to the left: thus, suppose he used for 10 the character X, and for eleven T, then his series would be thus:

1—1
2—2
3—3
4—4
5—5
6—6
7—7
8—8
9—9
10—X
11—T
12—10

13—11
14—12
15—13
16—14
17—15
18—16
19—17
20—18
21—19
22—1X
23—1T
24—20

so that 100 expresses, in this system, what we should represent by 144. We have dwelt on this point, because it seems to us that the practice of making experiments of this sort would serve to show pupils, more clearly, the nature and character of our system of numeration, the great and sole advantage of which lies in the system, not in the number which serves as its basis. Several tribes have not advanced beyond the rude system of adding successively one to one, and giving a new and arbitrary name to each new number; but for this reason they cannot count far, and, after going beyond a certain number, they generally say *many*. The Romans, though they had the decimal numeral system, nevertheless had not the decimal notation. In their notation, they took five units together, and wrote them thus, V; then they brought two such fives together, from which originated $\overset{V}{\Lambda}$, or X; five tens they wrote L; one hundred was written C, the initial of *centum*; five hundreds were expressed by the sign D; two five hundreds, or one thousand, by M. (See *M*.) A cipher written to the left of another of higher value, in this system, takes so much from its amount, as, XL is 40, and XC is 90; accordingly 1847 is written MDCCCXLVII. Here no sign has a value according to its position (except, in some degree, X; but it is not the value of X which is changed, but merely its character: it becomes negative by standing to the left of L), and pronouncing such a number is making an addition. It is utterly impossible for us to imagine the difficulty of their calculations, because, if we take a case of simple addition, as,

M
XLVIII
DV
CCIX
XXXVIII
XCII

---

it would be comparatively difficult for us to perform it, although the numbers form themselves in our mind, not according to these signs, but according to our decimal representation, and thus we can perform the operation much easier than they could. They, therefore, were obliged to have recourse to their *abacus* (q. v.). We may add, that 500 was represented by IↃ, as well as by D, and that for every Ↄ added, this number became increased tenfold; 1000 was also expressed by CIↃ, as well as by M; and for every CↃ added, one at each end, the number was increased tenfold. A horizontal line drawn over any figure, increases it a thousand fold.

Notation of the Greeks. These people had three distinct notations, the most simple of which was, the making the letters of their alphabet the representatives of numbers: α, 1; β, 2; γ, 3; and so on. Another method was by means of six capital letters, thus, Ι (ἰα, for μια), 1; Π (πεντε), 5; Δ (δεκα), 10; Η (ἑκατον), 100; Χ (χιλια), 1000; Μ (μυριας), 10,000; and when the letter Π enclosed any of these, except Ι, it indicated the enclosed letter to be five times its proper value, as stated above; thus

$\overline{|\Delta|}$ represented 50; $\overline{|\mathrm{H}|}$ 500; $\overline{|\mathrm{X}|}$ 5000;

and so on. This notation was only used to represent dates and similar cases: for arithmetical purposes they had a more organized system, in which thirty-six characters were employed; and by these any number, not exceeding 100,000,000, might be expressed, though, in the first instance, it appears that 10,000, or a myriad, was the extent of their arithmetic.

Our digits, . .	1,	2,	3,	4,	5,	6,	7,	8,	9,
they expressed by .	α,	β,	γ,	δ,	ε,	στ,	ζ,	η,	θ.
For our tens, as, .	10,	20,	30,	40,	50,	60,	70,	80,	90,
they employed .	ι,	κ,	λ,	μ,	ν,	ξ,	ο,	π,	ϟ;
for hundreds . .	ρ,	σ,	τ,	υ,	φ,	χ,	ψ,	ω,	ϡ;
for thousands . .	α̗,	β̗,	γ̗,	δ̗,	ε̗,	στ̗,	ζ̗,	η̗,	θ̗,

that is, they had recourse again to the characters of the simple units, which were distinguished by a small iota or dash placed below them; and, with these characters, a number under 10,000 was readily expressed; and this, as we have observed above, was for some time the limit of their arithmetic. Afterwards 10,000, or a myriad, was represented by M, and any number of myriads by M placed under the number of them. Thus,

$$\overset{\alpha}{\mathrm{M}}. \qquad \overset{\beta}{\mathrm{M}}. \qquad \overset{\gamma}{\mathrm{M}}.$$

represented 10,000 20,000 30,000, &c.

The *Notation of the Hebrews* resembled, in a great measure, that of the Greeks above described, only substituting Hebrew letters for Greek, as far as thousands; and, for representing thousands, they had again recourse to their simple units, distinguishing them only by two dots, or acute accents; thus, א̈, or א̋, expressed 1000; ב̈, 2000; י̈, 10,000; and so on. For the Egyptian system of notation, see *Hieroglyphics*. See also *Symbols*.

NOTCH. See *White Mountains*.

NOTE, Bank. See article *Bank*.

NOTE, Promissory. See *Bill of Exchange*.

NOTES, in music; the signs for tones (*notæ musicæ*). Even in the most remote antiquity, certain letters of the alphabet were used as signs for musical tones. According to some, the Hebrews made use of accents for this purpose, as the modern Greeks still do. The Greeks used different signs for vocal and instrumental music; and, as they had not yet conceived the idea of using the octave to express, by means of a prefixed key, a number of the most diversified tones in a similar manner, they must have required a great number of notes (said to have amounted to 990; half for vocal tones, half for instruments). As they used the alphabetical signs for notes, it became necessary to employ the same letter in different positions, (inclining, inverted, &c.); thus Γ signified, in different positions, seven different tones. Accents also were used, partly by themselves, partly added to letters. If a poem was to be sung, the letters which signified the instrumental tone were placed first; under these the letters for the voice; and under these the words. As the syllables of the Greek language have mostly a natural and distinct quantity (i. e. duration of time), the Greek notes were not required to show the time, and generally could be restricted to height, depth, and nature of tone. In the case of the syllables called common (short and long), there was a liability to mistake, and they were therefore marked with A if long, and with B if short. The fifteen chief tones of the Greek system (extending from our A to a̅; see the article *A*) were first reduced to seven by pope Gregory I., towards the end of the sixth century, and marked with the seven first letters of the Roman alphabet; so that the capitals were used for the first voice, the small letters for the higher octave, and the double letters for the highest octave. Parallel lines were soon invented, on which the letters were written. These were used until the happy idea was conceived of substituting for letters points with five lines, the points and rhombuses being placed as well between the lines as on them. This invention is generally ascribed to Guido of Arezzo. According to some, it was known even in the tenth century. The letters which had been formerly used as notes now became clefs. Still the sign for the duration of a note was wanting. The way of marking it was invented, according to some, by a German of Cologne, of the name of Franco, who lived towards the end of the eleventh century. Others ascribe the invention, or, at least, the improvement, to John de Murs (Jean de Moeurs, or Meurs). The *diminutio*, or division of one note into others of less value (for instance, the division of a fourth into two eighths), and the use of running notes, was invented first by Jean Mouton, chapel-master to king Francis I., in the sixteenth century. Since Rousseau, the designating of notes by ciphers has been repeatedly proposed, and adopted with great success in elementary schools; but, in other respects, the old way of writing notes—one of the most ingenious contrivances ever produced, which seems to have given to Leibnitz even the idea of a *pasigraphy* (q. v.) or system of universal writing—has kept its ground. As to printing notes, two periods are distinguished—the first when notes were printed by plates, the second by movable types. The first plates used for this purpose were of wood, and the oldest known are of 1473. Books are known of the time when this way of printing was not yet quite perfected, in which notes were drawn by the pen. Then the printing of notes by copper-plates was invented. The cheaper way of printing from tin plates, in which the notes are punched with steel punches, did not become common till the middle of the last century. As to the second period, the inventor is uncertain. Some consider Ottavio Petrucci, in the beginning of the sixteenth century, as such. James Sanlecque (born at Chaulne, in Picardy, 1573), a celebrated type-founder at Paris, where he died 1648, probably introduced the printing of notes from types into France. Yet the art of printing with them remained very imperfect, until the well-known typographer Breitkopf, at Leipsic, carried the process, in 1755, to such perfection, that he may fairly be called the second inventor. Tauchnitz, of Leipsic, first stereotyped notes. The process of lithography is used at present. Great musicians can sometimes compose with the pen in their hand, and without the aid of the piano. They hear all the music in their soul, as a picture stands, with all its hues and proportions, before the mental eye of an artist, before he touches the canvass. Many persons, however, who play well extempore, are by no means able to compose on paper; and for them a machine would be convenient, which could accompany the player's motions, and write the notes with a rapidity equal to that of his performance. The first idea of such a machine was given in the Philosophical Transactions, in 1747 (No. 483), as the invention of an English clergyman of the name of Creed; yet the practicability of this idea was not sufficiently shown. In 1748, a Mr Unger, burgomaster of Eimbeck, had the same idea without knowing of Creed's communication; and, in 1752, the academy of sciences at Berlin approved of his suggestions; but nothing was done until a member of the academy, Mr Sulzer, induced a mechanic, Hohlfeld, to construct such a machine from an imperfect description of Unger's plan. In the *Nouveaux Mémoires de l'Académie royale des Sciences et des Belles-Lettres à Berlin*, of 1771, is a description of this machine. It consists of two cylinders, from one of which paper rolls off, whilst it is rolled round the other, during which time the keys move corresponding pencils, which write the note on the paper. Not much use, however, has been made of the machine.

NOTKER, surnamed *Labeo*; a learned monk of St Gall, who died about 1022, and left a translation of the Psalms, with notes, in High German, one of the most important monuments of the oldest German prose. The manuscript is at St Gall. The work is printed in Schilter's *Thesaurus*.

NOTRE ANDRE, Le. See *Lenôtre, André*.

NOTRE DAME; the old French expression for the *Virgin Mary*, similar to the English expression *Our Lady*, and the German expression *Unsere liebe Frau*; hence it is the name of many churches, &c., in France, dedicated to the holy Virgin, and particularly of the great cathedral at Paris, whose two high square towers, without spires, are celebrated for their great bells, and also for the splendid prospect to be seen from them. The church itself contains four rows of pillars, fifty-four chapels, an excellent choir, and a great number of celebrated monuments and admirable paintings.

NOTTINGHAM; a large and populous town of England, situated 124 miles N.N.W. from London, at a short distance to the northward of the banks of the Trent. The little river Lene runs close to the town on the south side, and joins the Trent at about one mile distant from it. The situation of the town is extremely beautiful, the streets being ranged like terraces on the acclivity of a hill, which overlooks an extensive tract of country, exhibiting a diversity of romantic and picturesque scenery. At the top of this eminence, westward of the town, stood the modern castle, the front of which consisted of a rustic basement, supporting a Corinthian portico, with a flight of steps on each side leading to the principal entrance. This edifice was the property of the duke of Newcastle, but the apartments were divided, and let for the residence of different families. It was burned to the ground during the tumults occasioned by the debates on the reform bill, in 1831. Several of the streets of this town are wide, airy, and well-paved, considerable modern improvements having taken place here; and within these few years some handsome streets have been built in that part of the town called Standard hill. The staple manufacture of Nottingham is that of stockings, chiefly the finer kinds, as those of silk and cotton. The twist net is also made to a considerable extent, and the number of frames and machines cannot amount to less than 15,000. Several large mills have been erected in the town and its vicinity, for the spinning of cotton and preparing of silk. There are also manufactures of lace for veils, shawls, &c., the working of which gives employment, and is a source of profitable industry, to females. Nottingham has derived great benefit from the extension of inland navigation, having become a depot of goods for the adjacent country. Population, in 1821, 40,415; in 1831, 50,680.

NOTTINGHAM, Earl of; lord chancellor. See *Finch*.

NOTTINGHAM, Earl of; a naval commander. See *Howard, Charles*.

NOTTINGHAMSHIRE; an inland county of England, taking its name from the county town, is bounded, N. by Yorkshire, W. by Derbyshire, E. by Lincolnshire, and S. by Leicestershire. It is about fifty miles in length and twenty-six in breadth. Owing to its situation between the mountainous region of Derbyshire on the west, and the levels of Lincolnshire on the east, this county enjoys so favourable an aspect and climate as to be one of the most pleasant and fertile districts in the kingdom, an evidence of which appears in the unusual number of seats of the nobility and gentry included in it. The atmosphere is remarkable for its dryness, but experience shows that this circumstance does not detract from the fruitfulness of the soil. Almost the whole of the central and western part of the county was anciently occupied by the forest of Sherwood, famed throughout the kingdom as the grand theatre of the romantic exploits of the outlaw Robin Hood, who, according to the historians, Major and Fordun, lived in the reigns of Richard I. and John. This forest is still the property of the crown, but the greater part of the land it contained has been inclosed, and within its original boundaries are flourishing towns, large villages, and noble parks, for the sites of which royal grants have been obtained. The soil of this tract is principally sand and gravel; towards the north, on the borders of the Trent, clay prevails; and in the southern part of the county is the rich and beautiful vale of Belvoir, extending into Leicestershire, including both arable and pasture land in a high state of cultivation.

Nottinghamshire is, through almost its whole extent, watered by that noble river the Trent. The Idle is formed by the union of several streams from the central and north-western parts of the county; and after passing East Retford and Bawtry, it joins the Trent at West Stockwith. The Erwash, which rises in Derbyshire, skirts the western border of this county, and falls into the Trent near Attenborough.

Nottinghamshire is more distinguished for its manufactures than its agriculture. The former consist principally of hosiery, thread-lace, cotton-twist, and silk. The chief towns of the county are Nottingham, Newark, East Retford, Mansfield, Worksop, and Southwell. The population, according to the census of 1831, was 225,400, being an increase of 20 per cent. on the number ascertained in 1821.

NOUN (from the Latin *nomen*, name), in grammar; the name of a thing, or, more accurately, the name of a conception, whether general or particular. As we may have conceptions of substance or of attribute, nouns are either *substantive* or *adjective*. Again, as we have particular conceptions, or conceptions of individuals, and general conceptions, or conceptions of classes of individuals, nouns are either *proper* or *common*. In order to express unity or plurality of conception (number), the terminations of nouns undergo certain modifications of form; in some languages two, in some only one. Thus, in English, the form *man* expresses one individual, the form *men*, two or several; the former is said to be in the *singular*, the latter in the *plural* number; but in some languages, a peculiar modification is used to express the conception of two objects, and this is called the *dual* number. Verbs have also a corresponding modification of form, although they do not convey any idea of one or more objects. (See *Verbs*) To express the relations of conceptions to each other, the English language employs prepositions, or juxtaposition; but many languages make use of an inflection of the primitive form of the noun; this inflection is called *case*. The number of cases is different in different languages, but is rarely more than six. Many relations, even in the inflected languages, are expressed by prepositions, and, in most instances, a peculiar inflection and a preposition are both used. See *Language*, and *Philology*.

NOURISHMENT. See *Aliment*, *Chyme*, and *Dyspepsia*.

NOVACULITE. This stone is commonly known under the names of *hone*, *Turkey oil-stone*, &c. It is of a slaty structure, and owes its power of whetting or sharpening steel instruments to the fine siliceous particles which it contains. Various other stones are used as whetstones, such as common slate, mica slate, freestone, &c.

NOVALIS. See *Hardenberg*, *Frederic*.

NOVA SCOTIA; a British province of North America, situated between the forty-third and forty-sixth parallels of north latitude, and between the sixty-first and sixty-seventh degrees of west longitude; and bounded on the north by the strait of Northumberland, which separates it from Prince Edward's island; on the north-east by the gut of Canseau, which divides it from cape Breton; on the south-east and south by the Atlantic ocean, and on the west by the bay of Fundy and New Brunswick. It is a peninsula, connected by a narrow isthmus with the continent, and is about three hundred miles long, of unequal breadth, containing about 15,617 square miles. Cape Breton island belongs to this province, and constitutes one of its counties. The civil departments of the province consist of divisions and counties. Of the divisions there are five—the Eastern, Middle, Western, Halifax, and cape Breton. The cape Breton division comprehends the whole island of that name, which forms but one county. Thus there are ten counties, and these are subdivided into districts and townships. The term *division* has reference only to the circuits of the courts and their officers. A *district* is a portion of a county entitled to a court of general sessions of the peace. A *township* has no prescribed size, nor is it endowed with any corporate powers, except that most of them have the privilege of choosing representatives, and of voting money for the support of their poor. The population in 1827, according to the census of that year, was 153,848, of which number 30,000 were in cape Breton. The population has been rapidly increasing for several years, and, at the present time, doubtless, greatly exceeds the above enumeration. The means of subsistence are easy; the price of labour is high; the climate is healthy; and there are supposed to be as many as seven children to each marriage. A majority of the present inhabitants are natives, who are descendants of emigrants from Great Britain and the United States of America. In the eastern parts, there are many Scotchmen. There are no slaves. The face of the country is agreeably diversified with hills and dales; much of it is undulating, but there is no mountain more than 600 feet high. The ridges of land generally run north and south, and sometimes terminate in abrupt cliffs on the sea-shore. The appearance of the sea-coast is generally inhospitable, presenting a bold, rocky shore, and a poor and sterile soil, clothed with a thin and stinted growth of birch and spruce. The features of the northern coast, however, are far more pleasant. The shores are every where indented with harbours, rivers, coves, and bays; and these have a ready communication with the waters of the interior of the country, scarcely any part of which is more than thirty miles distant from navigation.

There is a great inequality in the surface of Nova Scotia; much of the land lies in broken ridges; and the country abounds with small lakes and short rivers. Lake Rossignol, a little to the westward of Liverpool, is said to be thirty miles in circumference. There are many bogs, but they are small. The arable lands of the country, as yet, bear but a small proportion to the wilderness; they are chiefly confined to the borders of rivers and harbours; but there are extensive tracts of excellent land which have not been cleared. About one-sixth of the land is supposed to be incapable of cultivation. The average crop of wheat on new land is said to be from seventeen to twenty bushels to the acre, and of rye from nineteen to twenty-two bushels. In many parts, much larger crops of wheat are raised; but a good crop of rye, Indian corn, barley, buckwheat, or oats, is much more certain to be obtained by proper culture. The soil of Nova Scotia produces potatoes of better quality than are, as yet, obtained in any other part of America. The average crop is two hundred bushels to an acre. Extensive strata of excellent bituminous coal are found in many places. The best that have been discovered are those of Pictou and Cumberland. Great quantities of coal are also found in cape Breton, and it constitutes an important article of export. For several years, the annual export from this island has averaged 8500 chaldrons. Gypsum, also, is abundant, both in the peninsula and in cape Breton.

The largest towns of Nova Scotia are Halifax, Liverpool, Lunenburg, Annapolis, Barrington, Pictou, Argyle, and Windsor. Many others are rapidly growing into importance.

The principal articles of export from Nova Scotia are dry fish, pickled fish, flour, potatoes, and gypsum. The exports of pickled fish, for the year 1828, amounted to 41,682 barrels, with a few tierces and half-barrels. The amount of dry fish for the same year was 174,017 quintals; and the amount of flour 26,721 barrels. Nearly 100,000 tons of gypsum are annually exported to the United States. The vessels built during 1828 amounted to 6147 tons. The exports from cape Breton in 1828 were as follows:—dry fish, 41,000 quintals; pickled fish, 18,000 barrels; coals, 10,000 chaldrons; potatoes, 12,000 bushels; oats, 5,000 bushels; live stock, 700 head; train-oil, 2209 barrels. The registered vessels belonging to the island were 340. Most of them were small, and were employed in the coasting and carrying trade. Small shallops, schooners, and boats, are not registered. Of these about 700 or 800 were employed in the fishing business.

The most numerous religious sect in Nova Scotia is the Presbyterian. Episcopalians, Roman Catholics, Baptists, and Methodists are also numerous. There is a university at Windsor, a grammar-school at Halifax, and academies are established at Pictou and Annapolis. Provision is made by the legislature for assisting the poor in supporting common schools; and the sum of £4000 is annually devoted to this purpose. The number of the militia of Nova Scotia in 1828 was 21,897.

The province of Nova Scotia is immediately dependent on the crown of Great Britain. The king appoints its governor and officers of state, and the colonists elect their representatives. The "captain-general, governor and commander-in-chief" of the British colonies resides in Canada. The governors of the several provinces are styled *lieutenant-governors*. The legislature consists of a council, or upper house, and a house of assembly. The council consists of twelve members, who are named in the governor's instructions, or are appointed by him. The members of the house of assembly are elected for the term of seven years. Nova Scotia was discovered by John Cabot, in 1497, and was probably the first land discovered on the continent of North America. It was first settled by the French, and called *Acadia*. In 1621, it was granted by James I. to Sir W. Alexander, and named *Nova Scotia;* but, in 1632, by the treaty of St Germains, it was restored to France. Subsequently, it several times changed its masters, and was the scene of many troubles and conflicts; and the country was not established in the quiet possession of the British government until the capture of Louisburg, in 1758. At the peace of 1763, the boundaries of this colony were so defined as to include New Brunswick; but a separation was afterwards made, by which the present boundaries were established. See Haliburton's *Historical and Statistical Account of Nova Scotia* (Halifax, 1829.)

NOVA ZEMBLA (*Novaia Zemlia*, i. e. new land); the name of two large islands in the Northern ocean, separated by Matotshnoi straits, and belonging to the Russian government of Archangel; lat. 70° 35' to 77° N.; lon. 47° 45' to 77° 20' E.; square miles 94,400. The Waigatz islands, to the south of Nova Zembla, are separated from the continent by the strait of the same name. The country is uninhabited, but is visited by Russian hunters and fishermen, some of whom pass the winter here. The reindeer, Arctic fox, ermine, and white bear are the principal quadrupeds. Water fowl, whales, seals, and various species of fish abound. Dwarf willows and some shrubs are found; moss and a short grass cover the ground in some places; but a great portion of the country consists of sterile rocks or sands. In the southern part, the sun disappears November 8, and does not rise again till the end of January. The twilight, however, continues about a fortnight, and the dreary horrors of these long nights are somewhat relieved by the northern lights. (See *Aurora Borealis*.) In general, the snow begins to fall in September, and lies till late in June, and in many places all the year round. In 1807, a Russian expedition was sent to examine a part of the coast, where silver was said to have been found; but no traces of it could be discovered. In 1819—22, the government caused the island to be explored.

NOVEL (from the Italian *novella*, a tale, news; though *novella* signifies, in Italian, something quite different from the English *novel*, which is called, in Italian, *romanzo*). The English nomenclature for works of fiction is not very complete. The same word *tale* must be used to designate the Italian *novella* (German *Novelle*) and the Italian *conto* (German *Mährchen*). No department of works of imagination has been so much cultivated as the novel. Their varieties are innumerable; from that form in which a series of historical occurrences is bound together by a very slight web of fiction, to the monstrous products of a distorted imagination. The novel is of a kindred character with the proper epic and the narrative idyl. It begins to be cultivated when the poetical age (*par excellence*) is passed, and man becomes engrossed with reality, and disposed to substitute minute description of the multiplied relations which have sprung up in society, in the room of the creations of his own imagination. Hence slow and accurate development becomes its character, prose its necessary form; and hence the possibility of immense variety. As a work of art, however, it must always form a harmonious whole. In the novel, reflection prevails much more than in other poetical productions, because, the language being prose, and the whole form of the work comparatively unrestrained, allow it, and the advanced period of society to which it belongs requires it. "In the novel," says Goethe, in his *Wilhelm Meister* (third volume), "sentiments and events are to be chiefly represented; in the drama, character and actions. The hero of the novel must be passive, at least, not in a high degree active; we expect of the dramatic hero action. Grandison, Clarissa, Pamela, the Vicar of Wakefield, Tom Jones, are, if not passive, yet retarding persons. In the drama, every thing resists the hero, and he overcomes the hinderances or succumbs." The field of the novel, however, is so great, that it seems to us these limits will not be observed in all cases. The intercourse of the different parts of the civilized world has become so great and rapid, and, consequently, their interest in each other so lively, that a kind of novels has become popular, belonging, like newspapers, to the peculiarities of our time. In fact, they are near akin to newspapers, being merely destined to give a superficial view of the temporary condition of foreign countries, with more connexion and minuteness than is practicable in the daily gazettes. These novels appear, are read, and are forgotten, like newspapers.

As to historical novels,[*] in which this country has so far outstripped every other nation (partly, perhaps, because our history is kept continually before us, from its connexion with the never-ending succession of constitutional questions), we are far from condemning them as an incongruous mixture of fiction and fact. They serve to give some idea of past events to people who would shrink from toilsome research; and, though this sort of knowledge is altogether insufficient for the wants of a sober inquirer into the past condition of men, it furnishes a better occupation for the crowd of readers for entertainment than mere works of fiction. It is the product of a manly nation, and has become popular in an age when people wish for something more substantial than the billing of lovers. The Greeks, who developed with such astonishing rapidity almost every branch of poetry, have left hardly any trace of the novel. If we do not consider Xenophon's picture of the education of a prince, in his *Cyropædia*, as a novel, the first production of this sort in the Greek language is the Milesian Tales, the product of a time when the Greek character was extinct; and to judge from the pastoral piece of Longus, on the loves of Daphnis and Chloe, we can hard conceive of any thing more flat, and full of vulgar sensuality. (See Heyne's *Critique of the Greek Novels*, in his German translation of *Chariton*.) Still fewer traces of this kind of composition are found with the Romans, who stood far behind the Greeks in the fine arts and poetry. The time of chivalry produced many distinguished works of fiction, but they are not what we now expect a novel to be. (See *Troubadours*.) The masterpiece of Miguel Cervantes—*Don Quixote de la Mancha*—which attacks the inflated romances of chivalry with such exquisite irony of description, forms the connecting link between them and the modern novel. See *Romances*.

The modern novel was not developed before the eighteenth century, and to this country is due the honour of having led the way. Samuel Richardson appeared with his Pamela, followed by Clarissa, so universally celebrated. In Grandison he strove to reach the highest perfection, but fell below his former productions. But Richardson had too much a single object in view, and therefore failed to produce a true picture of life. His heroes are personified virtue or vice. Richardson's novels are of the grave kind. Fielding's are humorous representations of familiar life. His Tom Jones, Amelia, and Joseph Andrews, display much knowledge of the human heart, and, as works of art, stand much higher than Richardson's. Smollett's novels are unrivalled for richness of character and fertility of incident. Sterne has shown incomparable humour in his Life and Opinions of Tristram Shandy and his Sentimental Journey, though he has borrowed much from Rabelais. Goldsmith's Vicar of Wakefield is the model of a picture of domestic life. The novel then declined, until, in modern times, it was revived with such splendour by Sir Walter Scott.

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[*] Towards the end of the seventeenth century and the beginning of the eighteenth, it was customary to relate, in the form of a novel, the secret history of German courts, giving to the persons names taken from ancient history. The voluminous works of duke Anthony Ulrich of Brunswick, particularly his Octavia, much diffused the taste for this kind of productions. Of this species is also *Fredegunda*, published from a Franch manuscript, at Berlin, in 1825. Fredegunda is Sophia Dorothea, wife to the electoral prince of Hanover, George Louis; at a later period, George I. of Britain. In the novel Octavia this unfortunate princess is called *Solane*.

The French excel in light, playful tales. Lesage's *Gil Blas de Santillane*, and his *Estevanille Gonzalez*, particularly the first, are highly distinguished. Voltaire's *Candide*, *Zadig*, *Micromegas*, &c., are lively sketches, but can hardly be called novels. Marmontel has the merit of a spirited ease and grace; but Arnaud's and Florian's works are little more than books from which we may learn a fluent and easy French. Rousseau, in his *Heloïse*, as in his *Emile*, is, after all, something totally different from a novel writer; he is a philosopher, but his philosophy is not such as recommends itself to the present time. As to the *Héloïse*, much of its merit, we think, lies in the passages which, though written in prose, are, in fact, of a lyrical character. Madame de Genlis, Madame Cottin, and, before all, the great genius Madame de Stael, had contributed to the fame of French literature, the latter shining, in her *Corinne* and *Delphine*, as one of the first class of writers. The historical novel has, of late, also found several successful imitators in France, as well as in Germany, in both which countries, all the novels of Scott, and many others, have been translated. Italy and Spain have produced little in the way of novels, though the tale (*novella*) flourished so early and brilliantly in the former. The first modern attempt at an Italian novel has been made by Manzoni.

No nation, probably, has been more productive in novels than the German; their number is immense, their character peculiar. The separation of the German man of letters from practical life, and the want of a national life, in which characters may develop themselves, are the causes both of the general failure of German novels in depicting men in their various situations, and of a want of manliness, to which we have alluded already in other places. Their descriptions sink not seldom almost to childishness, and, though there is, in the novels of several authors, matter enough for admiration, as, for instance, in Jean Paul, the excellencies are not those which properly belong to a novel. His men are not men. A comparison might be made in some points between Goethe and Scott. If the latter, in some cases, detains the reader too long with an historical introduction, almost amounting to a scientific dissertation, the former detains us, at the beginning of his *Meister*, with a prolix description of puerilities which few readers would wade through, did not the celebrated name of its author warrant a recompense in the sequel. Goethe's novels are, in their kind, some of the best ever written. In the seventeenth century, after the period of romances had gone by, novels appeared in Germany like Ziegler's *Asiatische Banise*, or Lohenstein's *Arminius*; and, in France, those of Mademoiselle Scudéri—portentous productions, in 8—12 vols., prolix, formal, and tedious. A better taste was awakened in the middle of the eighteenth century, by Richardson's novels. After this period followed novels, in which Stark and Lafontaine produced much. Hippel wrote some works of humour. Schlegel, Tieck, Novalis (see *Hardenberg, Frederic*), Wagner, Jean Paul, Goethe followed. Some of their productions, though in general excellent, are infected with a kind of mysticism, which nobody seems to understand but the author, if he. There is one writer who stands almost alone among German novelists—we mean Heinse, whose *Ardinghello* is distinguished for its vigour and voluptuous glow, and, though far from being commendable in a moral point of view, is unsurpassed in its department. Thummel's works show much knowledge of life and character, though the tone is such that it is not every reader who will acknowledge that he has read him. Wieland's novels certainly show the genius of their author, but his Agathon has probably excited much more sensuality than he has conquered. The novels still produced in Germany are very numerous, as the catalogue of the Leipsic book fair annually shows; but whether it were better for most of them "to be or not to be, that is the question."

NOVELS, in law, are those decrees of the Greek emperors which appeared after the official collection, in the *Codex repetitæ Prælectionis*, since the year 534 A. D. Of Justinian 160 are known, of which but 97 have the force of law, because these only were commented upon by the first commentators of the Roman law. The novels of the emperor Leo have no authority.

NOVEMBER (from *novem*, nine); the ninth month of the Roman year, which began in March. See *Calendar* and *Epoch*.

NOVERRE, JOHN GEORGE, the reformer of the art of dancing in Europe, was born at Paris in 1727. His father was an adjutant in the army of Charles XII., and he was destined for the military profession; but his taste led him to prefer dancing to fighting, and he became the pupil of the famous dancer Dupré. After attracting the notice of royalty in his own country, he went to Berlin, where he was equally well received. He returned to France in 1746, and composed, for the comic opera, his noted Chinese ballet, which made no extraordinary sensation. He afterwards produced other pieces of the same kind, and acquired so much celebrity, that Garrick invited him to England, where his talents attracted great admiration. Returning to France, he published, in 1760, *Lettres sur la Danse*, in which he started some new ideas, and proposed a radical reformation of his art. He afterwards became master of the revels to the duke of Wurtemberg, with whom he continued some years, and then held a similar office at Vienna. He went to Milan on the marriage of the archduke Ferdinand, and also visited the courts of Naples and Lisbon, where his merit was rewarded with the cross of the order of Christ. After a second journey to London, Noverre entered into the service of Marie Antoinette, queen of France, who appointed him chief ballet-master of the royal academy of music. He suffered greatly at the revolution, and passed the later years of his life in indifferent circumstances. His death took place in November, 1810. He published, in 1807, a new and enlarged edition of his *Lettres sur les Arts imitateurs, et sur la Danse en particulier* (2 vols., 8vo); and at the time of his death he was engaged on a dictionary of the art of dancing, intended to rectify the errors of the *Encyclopédie* on that subject.

NOVGOROD (properly *Nowgorod*, or *Nowgorod-Weliki*); a city of European Russia, capital of a government of the same name, situated on the Wolchow, at its efflux from lake Ilmen; lat. 58° 31' N.; lon. 31° 16' E.; population, 10,000. In the earlier periods of the middle ages, Nowgorod was the centre of the commerce of the Hansa (q. v.) and the Normans with Western Asia and the Byzantine empire. In the fifteenth century it contained a population of 400,000; and its magnificence, wealth, and power, gave rise to the proverb, "Who can stand against God and Nowgorod?" It still possesses marks of its ancient grandeur, among which are its sixty-two churches, with their gilt towers, and the ancient fortifications. In the cathedral of St Catharine are the celebrated Chersonese gates, with inscriptions, &c., and the Swedish gates. Novgorod was conquered by the grand-dukes of Russia towards the close of the fifteenth century.

NOVICE, and NOVITIATE. A *novice* is a candidate of either sex for a religious order; and *novitiate* is the time in which the novice makes trial of a monastic life, before taking the final vows. The Catholic church has always prescribed strict rules for the trial of novices, and the council of Trent charges the bishops to watch over the execution of these rules. The novitiate is generally very severe. The novice has to learn the regulations of the order, and, generally, to perform likewise many menial offices about the convent, and to give account of the most trifling actions to the master of the novices. All orders are not equal in their severity. The object of this harsh treatment—viz., that the monastic vows, if taken at all, may be taken voluntarily—is frequently frustrated by families compelling some of their members to embrace the monastic life, however reluctant they may be.

NOVY; Sclavonic for *new;* e. g. *Novygrad* (new town).

NOX; a Roman deity. See *Night.*

NOYAU; a cordial. The word is French, and the term is derived from the use of the kernels of apricots, nectarines, and peaches, in flavouring it. The use of them, in too large quantities, has sometimes made the liquor poisonous, as prussic acid may be extracted from them. The other ingredients in the liquor are French brandy, prunes, celery, bitter almonds, a little essence of orange-peel, and essence of lemon-peel, and rose-water. It is used like the other liqueurs. See *Liqueur.*

NUBIA; an extensive country of Africa, bordering on the Red sea to the east, Nigritia to the west, Abyssinia on the south, and Egypt on the north. It lies between north latitude 13° and 24°, and east longitude 28° and 39°, containing a superficial area of about 360,000 square miles, and divided into a great number of kingdoms, of which the principal are Sennaar and Dongola. It is intersected by the Nile, which here receives the Tacazze, and forms the celebrated peninsula of Meroe. (See *Meroë.*) In the northern part of the country there are extensive deserts, in which roam nomadic tribes, who lie in wait for the caravans. The valley of the Nile contains the largest part of the population, and is fertile. The climate in general is excessively hot, but in the eastern parts is more moderate. Among the animals are elephants, horses, camels, civet-cats, giraffes, lions, tigers, hyænas, hippopotamuses, crocodiles, ostriches. Senna leaves, ebony, sandal-wood, bamboo, gum, corn, tobacco, sugar, rice, tef (a kind of millet used for making bread), &c., are among the vegetable productions. Gold is found in mines, and in the river-sands. The principal article of traffic is slaves, which are imported from the central parts of Africa to the number of about 5000 annually, and exported chiefly to Arabia and Egypt. Dates, gums, and ostrich feathers, are also exported. The population is small in proportion to the extent of the country: it is chiefly composed of tribes of Arabian descent. The Nubians are perfectly black, and have the thick lips, but not the flat nose, nor the prominent jaws, of the negro race. They are well made, and have a pleasing expression of countenance; they are temperate, but not very industrious. They are chiefly Mohammedans. Only the northern part of the country and the coast of Habesh, or New Arabia, is subject to the Turks. The separate kingdoms are governed by independent chiefs, called *malek.* (See *Sennaar.*) Nubia is the northern part of the Ethiopia of the ancients, who placed in it the Nobates, the Blemmyes, the Troglodytes, and other tribes. Mohammed Ali sent an expedition to Nubia under his son, Ismael, in 1821, for the purpose of discovering gold mines, destroying the remnants of the mamelukes, and procuring a supply of negroes. This force penetrated as far as ten degrees north, but was then forced to retreat. Cailliaud, who accompanied the expedition, has written an account of the country.—See Burckhardt's *Travels in Nubia;* Gau's *Newly Discovered Monuments of Abyssinia;* Riffaud's *Voyage,* &c. (5 vols., with 300 plates, Paris, 1831).

NUDITY, in the fine arts; the naked state of the human body, to study which is equally important for the sculptor and the painter, because, though the latter comparatively seldom represents the human body entirely without covering, yet the appearance of the covering is determined by the structure of the frame. The reason why sculpture represents the naked figure so much more than painting, is because it can speak to the mind only through the form, while painting has the advantage of colours, which, conveying a lively idea of reality, compel the concealment of much of the body, and, in fact, afford the artist sufficient means of expression without such an exposure.

NUESTRA SENORA, and SENHORA (Spanish and Portuguese for *Our Lady*); the beginning of numerous geographical names; for instance, *Nuestra Senora de los Remedios de Pueblo Nuevo.*

NUEVO (Spanish for *new*) appears in many geographical names.

NUISANCE. Nuisances are either *common,* by which the public in general are incommoded, or *private,* and affecting particular individuals. Of the former class are all obstructions of the public highways, as by putting up a gate across the road; placing a person in the streets of a thronged city to distribute handbills of one's trade, whereby a crowd is collected; keeping a stage coach on the street an unreasonable time for taking in and discharging passengers or freight; occupying a side of the street, for loading and unloading wagons a great part of the day, though it be at the warehouse of the person who employs the wagons, and though there be sufficient room for two wagons to pass each other on the other side of the street; or occupying the street for the purpose of sawing timber, though it is done that the timber may be taken into an adjoining yard. But taking down a building, and putting up, instead of it, a higher one, whereby the street is darkened, is not a common nuisance. Obstructing a navigable river, which is but another highway, is a common nuisance, as by mooring a barge across it, erecting a bridge, or sinking any obstruction in the channel. But where a vessel was sunk in a river by accident, it was held, in one case, that the owner did not, by neglecting to raise and remove it, render himself liable to indictment for a common nuisance, though the navigation was in some degree obstructed. A neglect may be the occasion of a nuisance of this description, as well as a positive act, as where a person neglected to clear the channel of a river on his own grounds, and it was thereby made to flow back. But such a neglect would not, in all cases be a nuisance, either common or private, since it cannot, in general, be presumed to be the duty of all proprietors on the banks of a river to keep the channel free through their lands. Tumults and annoying sounds are another species of common nuisance; and a common scold, by perpetually disturbing the public, becomes liable to indictment and punishment therefor. Poisoning streams is an offence of this description; and so also is the occasioning noisome smells, to the public inconvenience. Common nuisances are punishable at the suit of the public, by indictment. Private nuisances are similar in kind, but are annoyances to only a few, and the persons who suffer may have an action on the case against the person who occasions them. Another remedy, both against common and private nuisances, is the right that every person incommoded by them has to abate or remove them. Thus if one wishes to pass along a street which another has encumbered by some nuisance, he is not obliged to wait to indict the party offending before he can pass, but he has a right to remove it, provided he does so without making any riot or tumult. And so if a person unlawfully builds a dam across a stream, whereby the water is made to flow back upon his neighbour's land, the proprietor of the land overflowed may go upon another person's land, without tumult, force, or riot, and remove the obstruction; but he must be certain that the dam is a nuisance, before he ventures upon such a step. Erecting a smelting-house near to one's land, whereby the grass and herbage are destroyed, has been held to be a nuisance. So is turning water towards one's house, so that it runs into his cellar. So is erecting a bridge, or setting up a ferry, very near to another bridge or ferry, so as to take away tolls. So a sesspool, tallow-furnace, place for keeping swine, lime-kiln, brew-house, tannery, and glass-house, have been held to be nuisances, in particular instances, where they were placed too near dwelling-houses. In one instance, in England, a blacksmith's shop, of which a neighbour complained, as keeping him awake during the night by the hammering, was held to be a private nuisance, though the blacksmith alleged in defence, that he did not work at unseasonable hours. A pigeon-house, or dove-cote, is not a nuisance. In case of complaint by a lawyer against a school kept near to his office, as disturbing him in his studies, the school was held to be no nuisance.

NULLITY, in law; is the entire invalidity of a legal proceeding, or legal instrument. It is distinguished from mere incorrectness, which may be remedied, while this defeats the whole process. The declaration of nullity is most frequent in the French civil and criminal law; and the court of cassation is appropriated exclusively to the trial of cases relating to this point. The corresponding process in England is called a *writ of error*. In Germany, it was provided, in 1654, that the complaint of nullity should be brought only in case of incurable defects, and within thirty years.

NUMANTIA, a town in that part of Spain called by the Romans *Hispania Tarraconensis*, is celebrated for its desperate resistance to the Roman power. The natives of Spain had continued the struggle even after the fall of Carthage, and Viriathus had endeavoured to organize a general insurrection of the Spanish tribes. The plan failed; and, while the greatest part of the Celtiberians returned to submission, the Numantians, who belonged to the Celtiberian tribe Arevaci, determined to hold out. The position of Numantia on a steep height on the Douro (Duero), at the confluence of the Punto, allowed an attack only on one side, which was strengthened by art. The first attempt of the Roman forces under the command of the prætor Pompeius Aulus (A. U. 616), was unsuccessful, and attended with great loss. Yet more disgraceful was the failure of the consul Hostilius Mancinus (617), who was compelled to capitulate on terms which the senate refused to ratify. The commanders who succeeded avoided coming to an engagement with the brave Numantians, who amounted to 8000 men capable of bearing arms. Scipio Africanus the younger, the destroyer of Carthage, was finally sent against them, with a force of 60,000 men. He determined to reduce the place by famine, and, having cut them off from all supplies, compelled the remnant to yield. Many of them, however, killed their wives and children and themselves, or threw themselves into the flames. Thus fell Numantia, which had resisted the arms of Rome for fourteen years, after a siege of fourteen months (621 A. U., 133 B. C.). The town was destroyed by the conqueror. Soria (6000 inhabitants) is supposed to be on the site of the ancient Numantia.

NUMA POMPILIUS, the second king of Rome, reigned from 714 to 672 B. C. (or from the thirty-ninth to the eighty-first year after the building of the city). He was the fourth son of Pompilius Pompo, a distinguished Sabine, and the husband of Tatia, the daughter of the Tatius who, for a long period, shared the kingdom with Romulus. After he had lived with her as a private individual in his native place for thirteen years, he retired, upon her death, to the country, where he led a secluded life, till he was called by the Romans from his retirement to the throne. Numa was not, like Romulus, a warrior, but possessed all the qualities of a lawgiver, and a just and wise ruler. He greatly strengthened the civil institutions of Rome, by uniting them with religious ceremonies. Numa rose far above his contemporaries, by the conception that no mortal can bring himself into communion with God, otherwise than in thought (as Plutarch has related, in his life of Numa). He was the founder of the Roman worship. The establishment of the colleges of pontifices, flamines, and vestals, the improvement of the calendar, the fixing of the *dies fasti* and *nefasti*, the veneration for *termini*, or boundary-stones, intended for the security of property, the founding of corporations, and the abolishing of human sacrifices, are all attributed to him. The temple of Janus was closed for the first time during his reign. Tradition relates that the nymph Egeria, in the grove of Aricia, was the friend and counsellor of Numa. Some have endeavoured to make him the pupil of Pythagoras; but they lived at least two centuries apart. He left an only daughter, Pompilia, who married Numa Martius, and became the mother of Ancus Martius, the fourth king of Rome.

NUMBER. See *Noun*.

NUMBERS. See *Notation*.

NUMERATOR OF A FRACTION; that number which stands above the line, and shows how many parts the fraction consists of, as the *denominator* represents the number of parts into which the unit is supposed to be divided.

NUMISMATOLOGY, or **NUMISMATICS**, is the name of the science which has for its object the study of coins and medals, principally those struck by the ancient Greeks and Romans. The word is derived from the Greek *νομισμα*, or the Latin *numus*, signifying *coin*, or *medal*. The name of *coins* is given to the pieces of metal on which the public authority has impressed different marks to indicate their weight and value, to make them a convenient medium of exchange. By the word *medals*, when used in reference to modern times, is understood pieces of metal similar to coins, but not intended as means of exchange, but struck and distributed in memory of some important event. The name of *medals*, however, is also given to all the pieces of money which have remained from ancient times. The parts of a coin or medal are the two sides; 1.

the obverse side, face, or head (*pars adversa, antica, l'avers*), which contains a portrait of the person at whose command, or in whose honour it was struck, or other figures relating to him. This portrait consists either of the head alone, or the bust (*protome*), or of a half or full length figure. 2. The reverse (*pars aversa, postica, le revers*) contains mythological, allegorical, or other figures. The words around the border form the legend; those in the middle the inscription. (See *Legend*.) Neither of these were originally placed on coins: the latter is frequently merely a monogram. The lower part of the coin, which is separated by a line from the figures, or the inscription, is the basis, or *exergue*, and contains subsidiary matter, as the date, the place where the piece was struck, &c.

Numismatics has the same divisions as history. Ancient numismatics extends to the extinction of the empire of the West; the numismatics of the middle ages commence with Charlemagne; modern numismatics with the revival of learning. The pieces of metal used first as money were rude and shapeless, with some mark to indicate at once their weight and value. Ancient writers even mention money of leather among the Carthaginians, Spartans, and Romans. Money of wood is also mentioned among the Romans; as also of shells, which are still used by some African tribes. But gold, silver, and copper have been and are the ordinary materials of money. The form of money is round, oval, square, triangular, or long, as were at first the *oboli*.

The study of medals is indispensable to archæology, and to a thorough acquaintance with the fine arts. They indicate the names of provinces and cities, determine their position, and present pictures of many celebrated places. They fix the period of events, determine, sometimes, their character, and enable us to trace the series of kings. They enable us to learn the different metallurgical processes, the different alloys, the mode of gilding and plating practised by the ancients, the metals which they used, their weights and measures, their different modes of reckoning, the names and titles of the various magistrates and princes, and also their portraits, the different divinities, with their attributes and titles, the utensils and the ceremonies of their worship, the costume of the priests—in fine, every thing which relates to usages civil, military, and religious. Medals also serve to acquaint us with the history of art. They contain representations of several celebrated works of antiquity, as the Hercules Farnese, the Venus of Gnidos. Like gems and statues, they enable us to trace the epochs of different styles of art, to ascertain its progress among the most civilized nations, and its condition among the rude. Medals are of great assistance to philology, and the explanation of the ancient classics.

The ancient medals were struck or cast. Some were first cast, and then struck. The first coins of Rome, and the other cities of Italy, must have been cast: the hammer could not have produced so bold relief. The copper coins of Egypt were cast. The right of coining money has always been one of the privileges which rulers have confined to themselves. The free cities have inscribed only their names on their coins. The cities subject to kings sometimes obtained permission to strike money in their own name, but most frequently were required to add the name or image of the king to whom they were subject. The medals of the Parthians and Phœnicians offer many examples of this sort. Rome, under the republic, allowed no individual the right to coin money; no magistrate was to put his image thereon, though, sometimes, this honour was allowed by a particular decree of the senate. We can count among the numismatic countries only those into which the Greeks and the Romans carried the use of money. The people in the most northern parts of Europe had no money, nor had those of Asia which extended most to the east, and those of Africa at a distance from the Mediterranean.

Weight should be the standard of the value of money; and many volumes have been written on the value of coins and their weight. The difficulties, however, have not been entirely cleared up, because the same terms (*as, dernier, sesterce*) have always been employed without regard to difference of time. In the code of Justinian, complaints are made of the indefiniteness of these expressions in donations. The difficulty is increased by the difference of weight in the coins of different cities, and by our ignorance of the value of gold and silver compared with that of bronze at different periods.

The coins preserved from antiquity are much more numerous than those which we possess from the period of the middle ages, in the proportion of a hundred to one. Medals are sometimes dug up singly, or in small numbers, where they appear to have been thrown by accident; but the principal stores are found in tombs, or in places where fear, avarice, or superstition, had deposited them. Millin thinks that the number of extant medals from ancient times may amount to 70,000. Till the third century, the faces on medals were represented in profile. In the coins of the lower empire, on the contrary, we see Gothic front faces filling the whole field of medals. The moderns have employed both modes. The ancients gave more relief to the figure. The art of coining has flourished much in Spain. That country was deprived of the privilege of coining in the time of Caligula. The most ancient Spanish medals are of silver; their form is rude, the style of the design barbarous. The numerous cities which existed in ancient Gaul, before its conquest by the Romans, fabricated money of gold, silver, and copper. The execution of some of them is excellent, but the greatest part are barbarous. No medals are known of Britain, with the exception of some struck by some of the Augustuses, towards the decline of the Roman empire; and the same may be said of Germany. The medals of some of the Italian cities bear the character of Greek art, and are excellent. The medals of these cities are numerous, as the Romans permitted their inhabitants to coin money long after having subjected them. Greece and Asia Minor present many fine and curious medals. The coins of the kings of Macedon are the most ancient of any yet discovered bearing portraits; and Alexander I., who commenced his reign about 500 years B. C., is the earliest monarch whose medals have yet been found. Then succeed the sovereigns who reigned in Sicily, Caria, Cyprus, Heraclea, and Pontus. Afterwards comes the series of kings of Egypt, Syria, the Cimmerian Bosphorus, Thrace, Parthia, Armenia, Damascus, Cappadocia, Paphlagonia, Pergamos, Galatia, Cilicia, Sparta, Pæonia, Epirus, Illyricum, Gaul, and the Alps. This series reaches from the era of Alexander the Great to the Christian era, comprising a period of about 330 years. This must be accounted the third medallic series of ancient monarchs; and the fourth and last descends to the fourth century, including some of the kings of Thrace, of Bosphorus, and Parthia, with those of Comagene, Edessa, or Osrhoene, Mauritania, and Judea. A perfect and distinct series is formed by the Roman emperors, from Julius Cæsar to the Gothic destruction of the empire, and, indeed, still later.

The Grecian medals claim that place in a cabinet, from their antiquity, which their workmanship might ensure to them, independently of that adventitious consideration. It is observed by Pinkerton, that an immense number of the medals of cities, which, from their character, we must judge to be of the highest antiquity, have a surprising strength, beauty, and relief, in their impressions. About the time of Alexander the Great, however, this art appears to have attained its highest perfection. The coins of Alexander and his father exceed all that were ever executed, if we except those of Sicily, Magna Græcia, and the ancient ones of Asia Minor. Sicilian medals are famous for workmanship, even from Gelo's time. The coins of the Syrian kings, successors to Alexander, almost equal his own in beauty. But adequate judges are constrained to confine their high praises of the Greek mint to those coins struck before the subjection of Greece to the Roman empire.

The Roman coins, considered as medals in a cabinet, may be resolved into two great divisions, the consular and imperial. The consular coins seldom or never bore the names or titles of consuls till towards the close of the republic; nevertheless, they are not improperly called *consular*, because they were struck in the consular times of Rome. These have also been denominated "coins of families," and are arranged according to the names inscribed on them. The brass consular coins are rather uninteresting, consisting chiefly of large, unwieldy pieces, with types of insipid similarity. Few of them have any imagery or symbol. Gold was first coined at Rome, sixty-two years after the application of the mint to silver. The general gold coin is the *aureus*. The consular coins, whose number is estimated at 200 in brass, and 2000 in silver, extend not to above 100 in gold, most of which are curious. The name of *imperial* medals is applied specifically to those struck after the conclusion of the republican era of Rome down to the fall of the Roman empire. Caius Julius Cæsar was the first Roman who obtained permission to put his figure upon medals. The triumvirs had each his set of medals. The medals struck after the death and apotheosis of Augustus bear the title *Divus Augustus*. With Constantine commences the series of medals of the emperors of the East or of Constantinople. The series of imperial medals concludes with those of Michael IX. The colonial medals had sometimes Greek, sometimes even Punic, legends; but those with Latin only are far more numerous. Some of these coins are elegant; but they are, for the most part, rude and uninteresting. They begin with Julius and Antony, and occur only in brass. Most of the gold consular coins are of great beauty and high value. The coins of the middle ages embrace the *bracteates*, &c., which, after the dissolution of the Roman empire, were circulated in the newly-formed European states—the second *incunabula* of the forgotten art of coinage.

The materials of which the ancient coins were composed, were, as in modern times, gold, silver, and the various modifications of copper. The laws of Lycurgus also make mention of iron coins being introduced among the Spartans; and the same has been said of Byzantium. But experience has not confirmed this information; and even if it had been the case, it is not likely that coins of a metal so liable to be destroyed by rust, as iron, should have been preserved to modern times. All that remains to us of the ancient coinage, is composed of the three metals above mentioned; and that these were the only materials used, appears highly probable from numerous specimens of the coins of the emperor Augustus, on the reverse of which the *triumviri*, who had the superintendence of the mint, used to denominate themselves: IIIVIR.A.A.A.F.F. that is *Auro Argento Aere Flando Feriundo*. Plate LXI. fig. 1.

According to the testimony of Pliny the Romans first began to coin money in the reign of Servius Tullius. This coinage was entirely of copper or brass, and was estimated by weight. The regulating weight was the pound, (*as, libra*.) which was divided into twelve ounces. The half pound was called *semis*. The mark of a pound on a piece of money was a straight line, like the letter I.; that of a half pound S, being the initial letter of the word *semis*. The mark of an ounce was a small ball. If the piece contained 1, 2, 3, 4, or 5 ounces, this was designated by as many balls. For a considerable time, the *as*, whether considered as a pound, or as a piece of money, was of equal weight; but afterwards its weight, as money, gradually became much depreciated. The impression on the *as* was, on the one side, the double head of Janus, and on the other a ship. Plate LXI. fig. 2.

The Romans began to coin silver money a few years before the first Punic war. It consisted of the *Denarius*, *Quinarius*, and *Sestertius*. The *Denarius* was so called, because it contained *denos asses*, or ten pounds of brass; in like manner, the *Quinarius*, or half of the *Denarius*, contained the value of five pounds; and the *Sestertius*, or half of the *Quinarius*, two pounds and a half of brass. The mark of the *Denarius* was X., that of the *Quinarius* V., and that of the *Sestertius* IIS. Plate LXI. figs. 4, 5, 6. In the older times, all the three coins had the same impressions, viz., on the obverse, the winged head of Pallas, and on the reverse, the mounted *Dioscuri*, or Castor and Pollux. But, at a later period, the subjects were chosen in an arbitrary manner, as we shall have occasion to show, when we come to treat of the coins of the Roman families. On the *Quinarii* there was generally impressed a goddess of victory, on which account they were frequently called *Victoriati*.

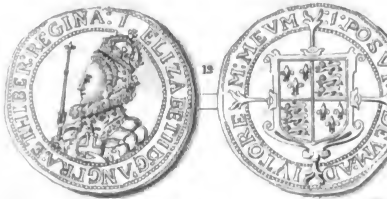
Brut. Imp. L. Plaet. Cest. *Head of M. Brutus*) (Eid. Mar. *The cap of liberty between two daggers.* Plate LXI. fig. 7.

L. Plautius. *A female mask with serpent hair*) (Plancus. *The winged Aurora conducting the four horses of the sun.* Plate LXI. fig. 3. The musicians who were employed at Rome during the public festivals, having been offended by the censor Ap. Claudius, withdrew from Rome to Tibur. As the Romans, however, were unwilling to dispense with them, the second censor, Plautius, brought them back by a singular stratagem. He repaired to Tibur, made acquaintance with them, invited them to a feast, and plied them so long and so hard with drink, that they at last lost all recollection. He then put a mask upon each of them, placed them altogether in a carriage, carried them to Rome, and left them in the open street. When they were discovered in this situation in the morning, the merriment was universal, the quarrel was made up; and to commemorate this ridiculous scene, an anniversary festival was instituted in honour of Minerva. This coin, struck by L. Plautius Plancus, a descendant of the witty censor, alludes to the above incident. On one side of the coin is a mask; and on the other the figure of Aurora, to denote the time at which the above *denouement* took place.

After Julius Cæsar had attained the supreme power, the senate allowed him to place his own portrait on coins—a privilege which had never before been enjoyed by any other individual in his lifetime. He appears with a lank countenance, and a bald head; on which last account he was permitted to cover his forehead with a wreath of laurel. Plate LXI. fig. 12.

Mag. Pius. Imp. Iter. *The head of Pompey the Great.*) (Præf. Clas. et. Orae. Marit. Ex. S. C. *Neptune standing with one foot upon a ship; on each side the pious brothers carry off their parents.* Plate

ENGLISH COINS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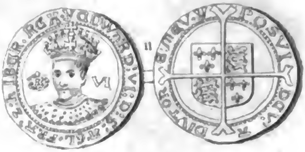
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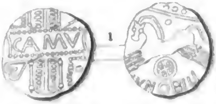
VI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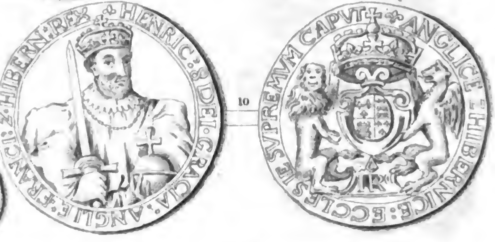
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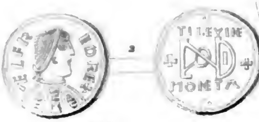
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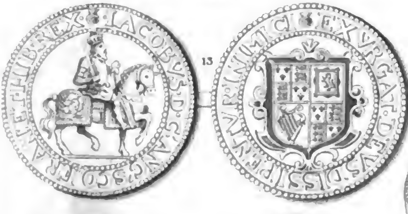
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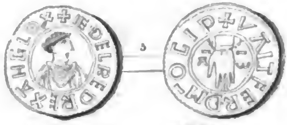
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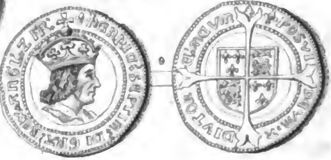
9
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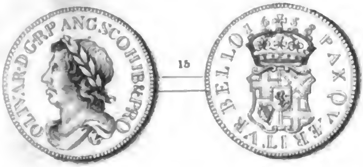
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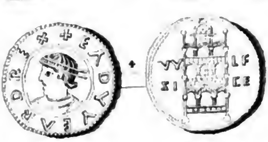
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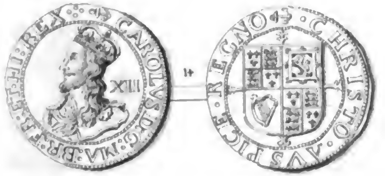
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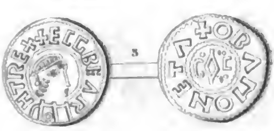
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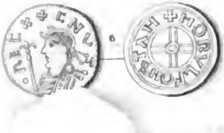
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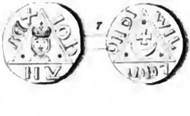
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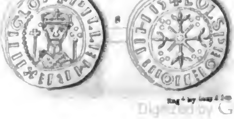
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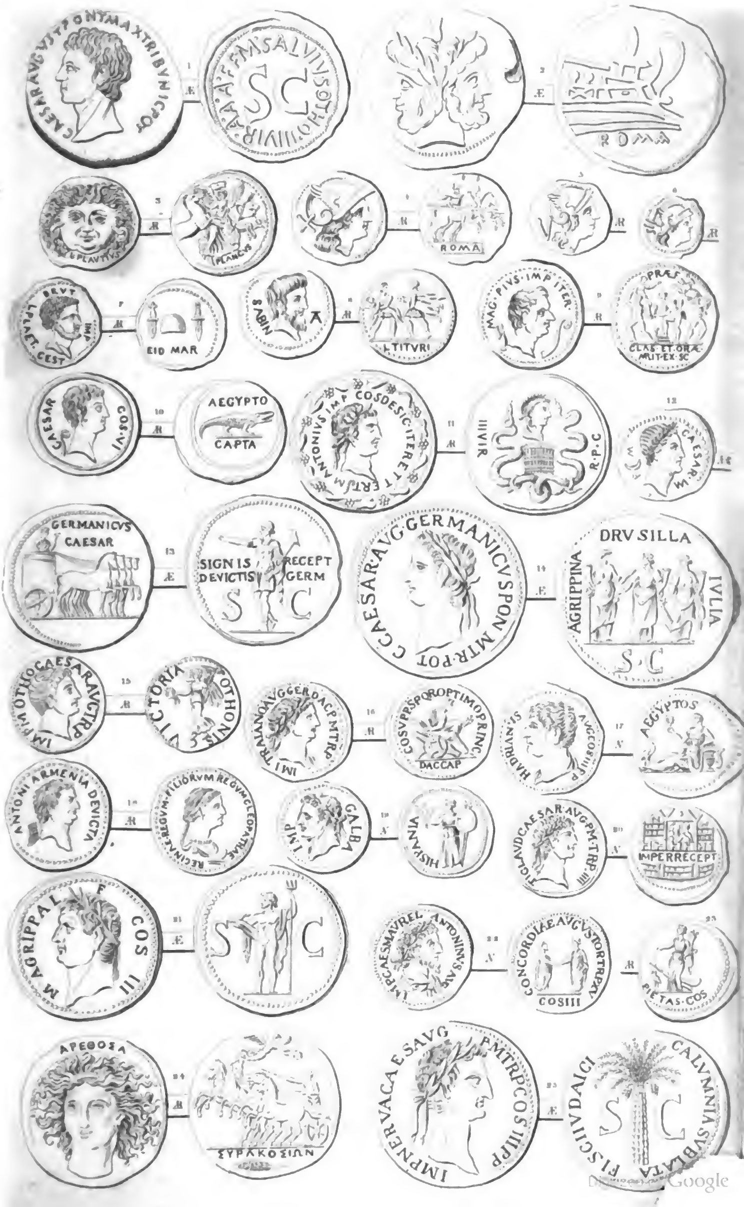
NUMISMATOLOGY.

PLATE IX

ROMAN COINS



LXI. fig. 9. After the death of Pompey the Great, his sons Cneius and Sextus continued the war on the part of the republic, but were vanquished by Cæsar at Munda. Sextus alone escaped, and concealed himself till the death of Cæsar, when he again came forward, fitted out a fleet, and so annoyed Mark Anthony and Octavian, that they were at length compelled to admit him into their alliance, and to give up to him Sicily, with the title *Præfectus classis et oræ maritimæ ex S. C.*

Pietas. Cos. *The figure of a woman, with a rudder in one hand, a cornucopia in the other, and a stork at her feet.* Plate LXI. fig. 23. The inscription on the reverse relates to Lucius, the brother of Mark Anthony. The word Pietas was adopted by Lucius Antonius to denote his affection for his brother Marcus. The stork was the symbol of piety, or natural affection.

M. Antonius. Imperator Consul Designatus Iterum et Tertium. *The head of Anthony, with a crown of ivy: a wreath of ivy also goes round the edge of the coin.* On the silver pieces, called *Cistophori.* Plate LXI. fig. 11. The ivy garland properly belongs to Bacchus; but as Anthony wished to be taken for Bacchus, it was placed round his coins out of flattery.

Antoni. Armenia. Devicta. *The head of Anthony, with an Armenian crown behind it.*) (Cleopatræ. Reginæ. Regum. Filiorum. Regum. *Head of Cleopatra, with the prow of a ship.* Plate LXI. fig. 18. This alludes to the stratagem by which Anthony deprived Artavasdes, king of Armenia, of his crown, and placed his own son, by Cleopatra, on the throne.

Octavianus Augustus. The names inscribed upon his earliest coins were generally, Cæsar. IIIVIR. R.P.C. Somewhat later, Imp. Cæsar. Divi. Filius. Ægypto. Capta. *A crocodile.* Plate LXI. fig. 10. This coin commemorates his conquest of Egypt; a crocodile having anciently been the symbol of that country.

M. Agrippa. L. F. Cos. III. *Head of Agrippa, adorned with a wreath of ships' prows.*) (s. c. *Neptune, holding a dolphin in his right hand, and the trident in his left.* Plate LXI. fig. 21. This coin alludes to Agrippa's naval victories. After the victory over S. Pompeius, Octavius presented him with a crown of ships' prows, called in Latin, *navalis, classica,* or *rostrata.*

Germanicus. Cæsar. *Germanicus on a triumphal car.*) (Signis. Receptis. Devictis. Germanis. S. C. *Germanicus holding in his left hand a staff with an eagle at the point of it.* Plate LXI. fig. 13. The obverse represents the triumph of Germanicus over the conquered Germans. The figure and inscription on the reverse allude to the recovery by Germanicus of the Roman eagles which had been lost in the unfortunate defeat of Quinctilius Varus by the Germans under Arminius.

Agrippina. Drusilla. Julia. S.C. *Three females, each holding in her hand a cornucopia.* Plate LXI. fig. 14. On this coin are represented the three sisters of Caligula, with their names inscribed.

Ti. Claud. Cæsar. Aug. Germ. &c. Imperatore Recepto. *Inscribed over the gate of the camp of the guards.* Plate LXI. fig. 20.

Servius Sulpicius Galba. Imp. Cæsar. Aug. or such like. Hispania: *A female figure, holding in her right hand a bunch of corn-ears and a poppy, and in her left a round shield with two lances.* Plate LXI. fig. 19. Galba was partial to Spain and the Gallic provinces, because they were the first to declare for him against Nero. The attributes of Spain are the bunch of corn-ears, to denote its fertility; and the round shield and lances the peculiar arms of the country.

Imp. Otho. Cæsar. Aug. &c. On Roman coins his head is never surrounded with the laurel wreath, but covered with a sort of curly wig. Plate LXI. fig. 15. No reason has been assigned for the uncommon rarity of the brass coin of this emperor. There are, indeed, a good many of this metal, which, however, were not struck at Rome, but at Antioch in Syria, or at Alexandria in Egypt. All the brass Othos, which have the form of the Roman coinage, are forgeries. There are a good many of gold and silver, bearing his name and portrait, which were struck at Rome. Even the genuine coins of this emperor have nothing remarkable about them, excepting those which bear the inscription—Victoria Othonis.

Imp. Nerva. Cæs. Aug. P. M. &c. Fisci. Judaici. Calumnia. Sublata. S. C. *A palm-tree.* Plate LXI. fig. 25. The Jews were liable to a tax of two drachmas for the maintenance of the temple at Jerusalem. After the conquest of Judea by the Romans, the produce of this tax was employed for the support of the temple of Jupiter Capitolinus. Under Domitian, this tax was levied by the officers in a very oppressive manner; but by an ordinance of Nerva these abuses were rectified; and hence the inscription on this coin.

Dacicus. Dacia. Capta. *A Dacian prisoner, with his hands bound behind his back, sitting upon three shields; behind him, two Dacian crooked sabres; before him, two darts.* Plate LXI. fig. 16. This alludes to the conquest of Dacia, which was made a Roman province. Hence Trajan took the title of *Dacicus.* Upon other coins of Trajan we read Dacia. Augusti. Provincia.

Hadrianus. Augustus. He was the first of the emperors who allowed his beard to grow, because, it is said, he wished to be taken for a philosopher. The custom was continued by his successors, until Constantine the Great laid it aside. Aegyptos. *A female seated on the ground, holding in her right hand the* sistrum, *and leaning with her left on a basket full of fruit: At her feet is the bird* Ibis. Plate LXI. fig. 17.

Concordiæ. Augustor. Tr. P. XV. Cos. III. *The two emperors, Aurelius and Verus, present their hands to each other.* Plate LXI. fig. 22.

ΑΡΕΘΟΣΑ. *A beautiful female head with the hair sticking out on all sides.*) (ΣΥΡΑΚΟΣΙΩΝ. *A youth, in a chariot and four in full career, crowned by a winged goddess of victory.* Plate LXI. fig. 24. This coin was struck at Syracuse, which is still the Peru of the collectors of coins. No Greek city presents us with so many gold and silver pieces, and of such weight. Its coins, too, excel all antiquity in the taste and beauty of their workmanship. The obverse of this coin represents the celebrated fountain of Arethusa, situated near the town and the sea; a divinity in the eyes of the Syracusans, and a favourite theme with many an inspired poet. The figure on the reverse, which always appears upon the Sicilian coins, contains an allegorical representation of their victories. The inscription, it will be observed, is in the Doric dialect.

Plate LXII. we have devoted to English coins. The reader is referred to the article *Coinage*, in this Encyclopedia, for a somewhat detailed account of English coinage. Meanwhile we proceed to describe the coins represented in the above plate.

Plate LXII. fig. 1. A gold coin of Cunobelinus; obverse, the legend CAMV. for *Camulodunum*, Colchester; reverse two horses and a wheel; the legend CVNOBILI.

Fig. 2. A coin of Alfred, bearing on the obverse a bust of the king, ornamented with a plain double fillet, and jewel in front; legend ELFRED REX; reverse, the name of the moneyer TILEVINE MONETA and LONDINIA, in a monogram.

Fig. 3. A coin of Egbert, bearing on the obverse a rude bust of the monarch; legend ECGBEARHT REX; reverse, the legend OBA MONETA, the cross, and a monogram, supposed to be Dorob. C.

Fig. 4. A coin of Edward I., bearing the bust of the king, with a plain double fillet, and legend EDWARD REX; reverse, the representation of a church, as is supposed, legend VVLFSIGE.

Fig. 5. A coin of Ethelred, bearing on the obverse the bust, adorned with a single fillet, having the ends pendent, and terminated with pearls, legend ÆTHELRED REX ANGLORUM; reverse, in the centre, *a* and *w*, with the hand of Providence, legend VALTFERTH. MOGIP. i. e. Ipswich.

Fig. 6. A coin of Canute, bearing on the obverse a bust of the king, with a kind of bonnet or helmet, surrounded by a fillet; both that and the bonnet have the ends pendent and ornamented with pearls; also a sceptre, surmounted with a *fleur de lis*, legend CNUT. REX. Reverse, MOKULFON. STAM. i. e. Stamford.

Fig. 7. An Irish halfpenny of king John; obverse, full face, in a triangle, which is supposed to represent the Irish harp, legend JOHANNES REX. Reverse, in a triangle, a crescent, and blazing star, with a small star in each angle of the triangle, legend WILLEM ON DI., i. e. Dublin.

Fig. 8. A penny of William, which is ascribed to the Conqueror, from the circumstance of the double sceptre, to which his son Rufus had no pretension; the sceptre in his right hand is surmounted with a cross paté, or holy cross; that in his left is surmounted with three pellets or pearls crosswise at the point, legend WILLEM REX ANGLOR., the Saxon 𝔚 (W), being invariably used on these coins. Reverse, a cross, with four sceptres, *bottonné* or *pommetté* in the quarters, in form of an escarbuncle.

Fig. 9. A shilling of Henry VII. Obverse, profile of the king to the left, with a crown of one arch only; mint mark a *fleur de lis* on both sides; legend HENRIC. SEPTIM. DI. GRA. REX. ANGL. Z. FR. Reverse, the arms of France and England quarterly, in a plain shield, surmounted by a cross fourché. In the smaller coins is a key on each of the lower quarters of the cross below the base of the shield; legend POSUI DEU. ADIUTOREM MEU. The coins of this reign were distinguished from those of preceding reigns by several particulars: the arms of England and France took place of the pellets; numerals, as VII., were first used on some coins, to distinguish the kings of the same name, besides the exchange of the side face for the full face: a practice which has continued ever since, with this difference only, that the heads are sometimes turned to the right, and sometimes to the left.

Fig. 10. A crown of Henry VIII., which is supposed to have been struck upon Henry's assuming the supremacy, and to have served more as a medal than a coin. Obverse, face nearly full, bust to the waist, crown of *fleurs de lis*, and plain crosses; in the right hand a sword, resting upon his shoulder, and in his left the orb, with the cross, denoting thereby that he was ready to defend his dominion and faith by the sword; legend HENRIC. 8. DEI. GRATIA. ANGLIE. FRANCI. Z. HIBERN. REX. Reverse, the royal arms crowned and supported by a lion and a dragon; legend ANGLICE Z HIBERNICE ECCLESIE SUPREMUM CAPUT, and beneath the shield, H. R.

Fig. 11. A shilling of fine money of Edward VI. Obverse, a bust of the king full-faced, crowned, and in parliament-robes, with a chain of the order of the garter; on one side of the face a double rose, and on the other XII. to denote the value; mint mark a ton on each side; legend EDWARD VI. D. G. AGL. FRA. Z. HIB. REX. Reverse, arms in a plain shield, surmounted by a cross fourche. This is supposed to be the first and only English coin or medal, whereon the collar of the order of the garter is to be seen; but, whether from the mistake of the engraver, or any other cause, this is different from the collar of the order appointed by the statutes of Henry VIII., which was to be composed of double roses encompassed with the garter; whereas this has single roses of four leaves only, without garters, and without knots between. The silver coins of this reign were the last on which the heads of any of our princes have been represented with a full face.

Fig. 12. A half-crown of queen Elizabeth. Obverse, bust of the queen, having the hair curled in two rows next the face, and turned up behind, ruff, and gown richly ornamented: sceptre fleuré in the right hand, globe or mound in the left; mint mark on both sides the Arabic figure 1; legend ELIZABETH D. G. ANG. FRA. ET HIBER. REGINA.

Fig. 13. A half-crown of James I. Obverse, the king on horseback, in profile to the left, crowned, and in armour. In his right hand a drawn sword; the horse ambling; on the housing a rose crowned; mint mark on both sides a thistle; legend JACOBUS D. G. ANG. SCO. FRAN. ET HIB. REX. Reverse, in an escutcheon, highly ornamented, the royal arms, quarterly—first and fourth, England and France, quartered; Scotland in the second; Ireland in the third. The arms of Ireland now appear for the first time upon the coins.

Fig. 14. A shilling of Charles I. Obverse, bust of the king turned to the right, crowned, and in armour, with long hair, the object of puritanical abhorrence; mint mark, on both sides, an anchor; legend CAROLUS D. G. MAG. BRI. FRA. HIB. REX. Reverse, arms of England, France, Ireland, and Scotland, on a plain square shield, and cross fleuré; legend CHRISTO AUSPICE.

Fig. 15. A shilling of Cromwell. Obverse, bust in profile to the right, laureat, with a Roman mantle; legend OLIVAR. D. G. R. P. ANG. SCO. HI. &c. PRO. Reverse, in a shield, surmounted by an imperial crown, quarterly, first and fourth, St George's cross for England; second, St Andrew's cross for Scotland; third, the harp for Ireland. On an escutcheon of pretence a lion rampant; legend PAX. QUÆRITUR. BELLO. 1658.

Plate LXIII. we have devoted to Scottish coins. With regard to the coinage of Scotland, it is believed that there exist silver pennies of Alexander I., who reigned in 1107; and there certainly are some of Alexander II. in 1214, as also of David in 1124. There are many coins of William I. in 1165; and a large hoard of his pennies was found at Inverness in 1780. The money of Scotland was of the same value with that of England, until the vast drain occasioned by the enormous ransom of David II., after which its size was reduced; and its value continued to diminish to such a degree, that in 1600, it passed only for a twelfth part of the English money, and remained at that low ebb until the union of the two kingdoms.

The only silver coin was the penny, until the year 1293, when Alexander III. coined also halfpence; and there are silver farthings of Robert I. and David II. The groat and half-groat were also introduced by the latter, which completed the set of Scottish silver. These all ceased to be coined in the time of queen Mary; when shillings were first coined, with the bust of the queen on one side, and the arms of France and Scotland on the other. The silver crown, of the value of 30s. Scots, was first coined in 1565; smaller pieces of 20s. and 10s. were likewise struck, and marks of silver, worth 3s. 4d. English. These

SCOTTISH COINS

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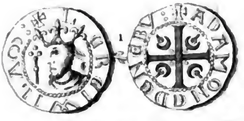

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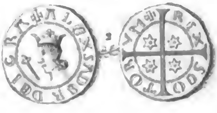

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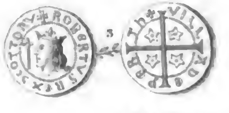

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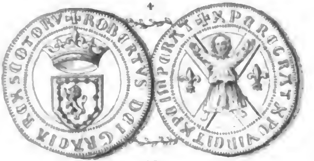
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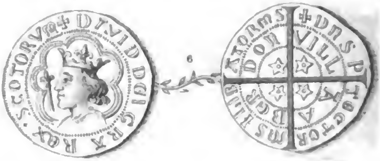
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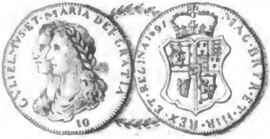
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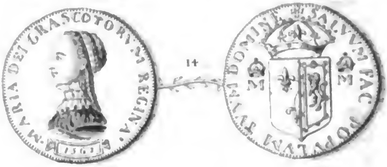
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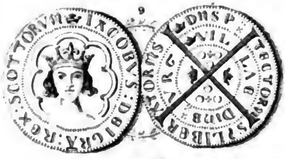
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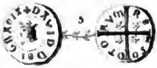

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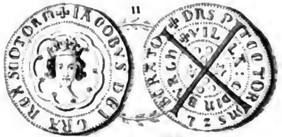
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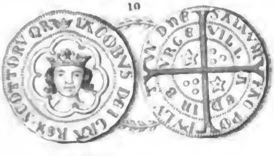

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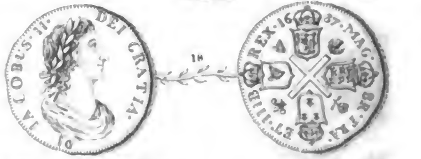

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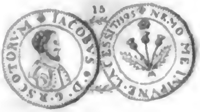

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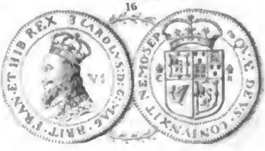
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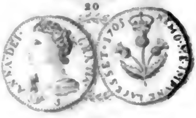

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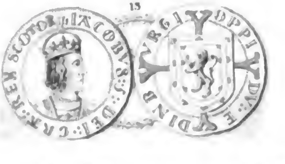
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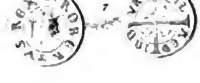

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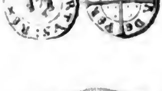

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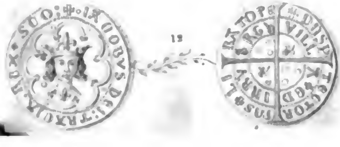
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VILLA EDINBVRG

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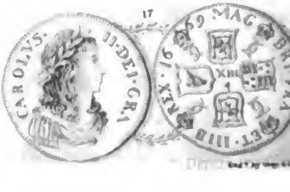
CAROLVS II DEI GRA
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XIII

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coins have the mark XXX., XX., X., upon them, to denote their value. The motto, NEMO ME IMPUNE LACESSET first appears on Scottish coins in 1578. The crown of an ounce weight gradually increased in nominal value, until, in 1601, the mark was LX. In the time of Charles I., half marks, 40, and 20 penny pieces, were coined. In 1665, the Scottish dollars first appeared, in value 56s. Scots, with the half and quarter of proportional value. In 1686, James VII. coined 60s., 40s., 20s., 10s., and 5s. pieces; but only those of 40s. and 10s. are known. At the union of the kingdoms, all the Scottish coins were called in and recoined at Edinburgh, with the mark E. under the bust. In general, the Scottish silver coins are equal, if not superior, in execution, to the English.

Gold was first issued in Scotland by Robert II. The pieces were at first called St Andrews, from the figure of that tutelar saint upon the cross. The lion was another name for the largest gold coins, from the arms of the kingdom upon it. Then comes the unicorn under James III.; which was followed by the bonnet-pieces of James V.; which last are of admirable workmanship. The last gold coined in Scotland consisted of the pistole and half pistole, of twelve and six pounds Scots, which have the sun under the head.

The Scottish copper coinage is of an earlier date than that of England. It was preceded by money of billon, called black money, consisting of copper washed with silver. The true copper coinage began in the time of James VI. The *bodle*, so called from Bothwell the mint-master, was worth two pennies Scots. The *baw-bee* (*bas-piece*) was also coined, corresponding with the English halfpenny. Some pieces called Atkinsons were also coined by James VI. in 1582, which went for a third more than the value of the baw-bee. Besides these, there were the hardie and the plack, the former worth three the latter four pennies Scots. The Scottish coins of Charles I. are very rare.

We now proceed to describe the coins represented in Plate LXIII.

Fig. 1. A penny Scots of William, surnamed the Lion, who succeeded his brother Malcolm IV. in 1165. The king is represented in profile. The legend is *Le Rei Wilam.* On the reverse the name of the coiner and the place where coined—*Adam on Edenebu*—are given. Five different places of mintage appear of this king's coin, viz., Edinburgh, Berwick, Perth, Roxburgh, and Stirling.

Fig. 2. A penny of Alexander III., who succeeded his father in 1249. Legend *Alexsander Dei Gra:* reverse *Rex Scotorum.*

Fig. 3. A penny of Robert Bruce, who obtained the crown in the year 1306. Legend *Robertus Rex Scottoru:* reverse *Villa de Perth* (town of Perth.)

Fig. 4. A coin of Robert III., with the royal arms crowned, and St Andrew's cross on the reverse. See fig. 8.

Fig. 5. A farthing of David II., who succeeded his father in 1329.

Fig. 6. A groat of the same monarch. Legend *David Dei Gra Rex Scotorum:* reverse *Dns Ptector MS et Libator MS,* i. e. *Dominus protector meus et liberator meus.* Inner circle, *Villa Aberdon.*

Fig. 7. A halfpenny of Robert II., who succeeded to the throne in 1371. Reverse legend *Villa Edinburg.*

Fig. 8. A small coin of Robert III., who succeeded his father, Robert II., in 1390. Reverse legend *Villa de Perth.*

Fig. 12. A groat of James I., who succeeded his father in 1406. Legend *Jacobus Dei Gratia. Rex Sco.* Reverse *Dns Ptector MS et Libator.* Inner circle *Villa Edinburgh.*

Fig. 9. A groat of James II., who succeeded to the throne in 1437. Legend *Jacobus Dei Gra Rex Scottorum.* Reverse *Dns Ptector MS Liberator MS* (explained above.) *Villa Edinburgh.*

Fig. 11. A groat of James III., who succeeded to the throne in 1460. Legend *Jacobus Dei Gra Rex Scotorum.* Reverse *Dns Ptector MS et Leberato. Villa Edinburgh.*

Fig. 10. A groat of James IV., who was crowned in 1488. Legend *Jacobus Dei Gra Rex Scottoru Qra* (*i. e. Quarta* or IV.) Reverse *Salvum Fac Populu tuu Dne. Villa Edinburge.*

Fig. 13. A groat of James V., who succeeded his father in 1514. The king's head in profile regarding the left. Legend *Jacobus 5 Dei Gra Rex Scotor.* Reverse: the arms of Scotland in the centre of the great cross of Malta, which reaches to the edge of the piece. Legend *Oppidu Edinburgi.*

Fig. 14. A testoon of queen Mary, who succeeded her father, when only a week old, in 1544. The widowed head of the queen, regarding the right; underneath a scroll, with the date 1562. Legend *Maria Dei Gra. Scotorvm Regina.* Reverse: in a shield, the royal arms of France are half effaced on the dexter side by those of Scotland on the sinister, having on each side an M crowned. Legend *Salvvm fac. Populvm tvvm Domine.*

Fig. 15. A half-merk of James VI., who was placed on the throne, on his mother's resignation, which happened in July, 1567, when he was but a year old. The king's bust bareheaded, looking to the left, in armour. Legend *Jacobus 6 D. G. R. Scotorum.* Reverse: a three-headed thistle crowned. Legend *Nemo me impune lacesset*, 1595.

Fig. 16. A sixpence of the reign of Charles I. who succeeded his father in 1625. King's head crowned. VI behind the head to denote the value of the piece. Reverse: the arms crowned; C. R. crowned at the side of the shield. Legend *Quæ Deus conjunxit nemo sep.*

Fig 17. A merk (date 1669) of the reign of Charles II., who succeeded to the crown in 1660. The XIII. in the centre of the reverse denotes its value.

Fig. 18. A coin of the reign of James VII. (II. of England) who succeeded to the throne in 1684. The only two coins this monarch struck in Scotland were the 40s. and 10s. Scots money. The 10 beneath the head denotes the value of this piece.

Fig. 19. A coin of William and Mary, who supplanted James II. in 1688. The figure 10 denotes it of the same value as the preceding

Fig. 20. A coin of queen Anne, who succeeded to the crown in 1701. There were but two coins of this reign struck in Scotland, the ten and five shillings Scots. The 5 on the present piece marks its value.

Numismatics appears to have been entirely unknown as a science to the ancients. It does not appear from any ancient works, that any value was set upon coins as curiosities by the collectors of works of art, in the times of Augustus and the Antonines, though there were, at that time, series of coins of cities, some of which have come down to us, and attract attention on account of their antiquity, and the beauty of their execution. Such are the coins of Sybaris, and the cities of Magna Græcia, which, with their independence, lost the right of coinage. This disregard is more remarkable, as gems, which are so nearly allied to them, were in high esteem; but, in the fifteenth, and particularly in the middle of the sixteenth century, princes and private individuals, particularly in Italy, France, and Germany, rivalled each other in zeal for collecting these remains of antiquity, at first, principally with a view of obtaining portraits of the chief characters of Roman history. Learned treatises soon succeeded these first collections, in which the chief attention had been paid to striking impressions. The earliest treatise upon numismatics was published by a Spaniard, Antonio Agostino, in 1577, in his dialogues, which have been translated into all languages. Jac. and Octav. Strada, by works illustrated with plates, drew the attention of the great and the rich to this subject. Wolfgang Lazius, physician to Ferdinand I., made use of coins for the illustration of history. Fulvio Orsini and Ad. Occo, a physician at Augsburg, applied themselves to the study of the Roman family and imperial coins; and it is to be regretted that the latter restricted himself so much in his inquiries, for his process, with respect to chronological arrangement, was confessedly good. Hub. Goltz, the son of a painter of Wurtzburg, is particularly worthy of mention, as the first who paid much attention to Grecian coins; but there is a want of accuracy in the writers of that period, which renders a great part of their labours useless. Goltz was at once a draughtsman and an engraver, but suffered himself to introduce so much of his own invention into his engravings of coins, that they are liable to suspicion in many cases where they may have been correct. Meanwhile, the art of imitating the genuine antique coins began to be practised. At first, without any intention of deceiving, but merely to facilitate the study, the skilful die-cutters, Cavino, Belli, &c., at Padua, Parma, and Vicenza, made imitations of ancient coins; but these imitations were afterwards passed off for genuine, and soon became an article of trade, which has continued to this day.—See Sestini's *Sopra i moderni Falsificatori di Medaglie Greche antiche, etc.* (Florence, 1826, 4to.)

The great numbers of counterfeit coins deterred many, during the period which now commenced, from the study of numismatics; at least, it lessened the taste for this study, always difficult on account of the learned apparatus necessary; but the researches into separate departments of the science became more extensive, and the works of Vaillant, Spanheim, J. J. Gessner, Pellerin, not to mention numerous others, who have applied immense stores of learning to the illustration and explanation of numismatics, are well worthy of attention, though they are not to be implicitly trusted. The materials had now so much increased by the accumulation of newly-discovered pieces (Vaillant visited the East several times; Pellerin added to the Parisian cabinet alone 33,000 ancient coins), that a critical selection and arrangement of the genuine became doubly necessary, in order to facilitate a general survey of them. Joseph Eckhel undertook this task with success, and, by a strict geographical and chronological method, introduced so much order into this science, that great light was shed upon many obscure points of history and archæology. His system was first practically applied by himself to the arrangement of the cabinet at Vienna, and afterwards presented in an improved form in his great work *Doctrina Numorum veterum* (Vienna, 1792—98, 8 vols., 4to.), to which all later researches can only be considered as additions or improvements. Domenico Sestini followed this system in his works upon the numismatic Hermæ—*Lettere e Dissertazione Numismatiche* (10 vols.); Mionnet, in his *Descr. des Médailles Grecques antiques* (a fifth supplementary volume of which has already appeared). The investigations into the mixtures of metals, and the execution of the stamps; the form, size, weight, value, and number of the ancient coins; their genuineness or spuriousness, become susceptible of more certainty, by the accumulation of materials of comparison; and the understanding of the types and legends is also facilitated by similar means. The coins of the middle ages, which have from time to time been brought to light, are now sought for with zeal. By pursuing the same method with the modern as with the ancient coins, arranging them in a strictly chronological order, they have been made to shed light upon subjects which manuscripts had left unexplained.

The separate works upon the coins of different countries, such as those by Lastonaso for Spain, Zanetti for Italy, Le Blanc for France, Leake for England, Bicherodt for Denmark, &c., Becker for Germany, Voigt for Bohemia, and others, afford a mass of materials, but are sometimes open to criticism. We should here also mention K. F. W. Erbstein's Numismatic Fragments relative to Saxon History, together with an Appendix of the remarkable Coins of the Middle Ages (Dresden, 1827, in German; and Chr. Jak. Goetz's Imperial German Coins of the Middle Ages, containing 600 coins from Charlemagne to Maximilian I., in fifty-two lithographic plates, with descriptions (Dresden, 1828). The modern coins and medals are more valuable as specimens of art than as historical guides. They are, as Herder has remarked, a striking proof of the varieties of taste. There a view of the progress of numismatics is facilitated by the splendid works, entitled *Histoires Métalliques*, such as those of Louis XIV., XV., Napoleon, &c. Some authors have treated of particular coins—Lilienthal's Cabinet of Dollars (*Thalercabinet*); Koehler's Cabinet of Ducats (*Dukatencabinet*); Boehme's Cabinet of Groschen (*Groschencabinet*), &c.; and this method renders a more minute examination practicable. L. Ch. Schmieder's Dictionary of Numismatics—*Handwörterbuch der gesammten Münzkunde* (Halle and Berlin, 1811—15) is a truly learned manual. The literature of numismatics is prolific; and there are several works which will assist the student in a general view of the science, such as *Banduri Bibliotheca Nummaria, seu Auctorum qui de Re Nummaria scrips., ed. a I. A. Fabricio* (Hamburg, 1719, 4to); *Lipsius Bibliotheca Nummaria, etc.* (Leipsic, 1801, 2 vols.); but a work is yet wanting which shall give a full view of the actual state of the science.—See also Pinkerton's *Essay on Medals* (2 vols., 8vo, London, 1789); Evelyn's *Numismata* (folio, 1697); and Addison's *Dialogues on ancient Medals* (London, 1726).

NUNCIOS; the persons sent by the pope on foreign missions which concern ecclesiastical affairs. (See *Legate*). The Roman bishops had agents at the court of the emperors from the fourth century, under the name of *apocrisiarii* and *responsales*. It was not till the ninth century, that the increasing power of the pope occasioned extraordinary missions of legates to provincial synods and foreign courts, when subjects of great importance were to be considered. In the eleventh century, Nicholas II. and Alexander II. sent such representatives *ad visitandas provincias*, to root out heresies, with unlimited power—a measure of which Gregory VII. and his successors, of course, eagerly availed themselves. The legates presided at the synods which they convoked, and decided in the most important ecclesiastical affairs. Many bishops procured the office of legate for themselves, in order to prevent the entrance of foreign legates into their dioceses; but neither this precaution, nor the open resistance of the German bishops, could prevent the inroads of papal power. England freed herself from this intrusion by having the archbishop of Canterbury declared perpetual legate in the twelfth century, and Philip the Fair, king of France, even dared to arrest a papal legate, in the fourteenth century. The German bishops had succeeded, down to the fifteenth century, in preventing the establishment of permanent legates, and their tribunals; but, when the reformation pressed the German Catholic church extremely hard, the pope succeeded in introducing them. Thus originated four permanent *nuntiaturæ*, with archiepiscopal privileges, at Vienna, Cologne, Lucerne, and Brussels; and, in spite of the struggles of the clergy, Pius VI. even established a new one at Munich, in 1785. Joseph II., October 12, 1785, denied the right of the nuncios to jurisdiction in ecclesiastical affairs, and the archbishops of Mayence, Treves, Cologne, and Salzburg, agreed, at the congress of Ems, to limit the popes to the privileges which they had enjoyed in the first centuries over foreign dioceses. But the elector of Bavaria supported the nuncio Zoglio, and the party of the nuncio, at Brussels, who had been at first driven away, was victorious during the troubles in the Netherlands, excited by the measures of the emperor Joseph; and, in Germany, the bishops of Wurzburg, Spire, Hildesheim, and Liege, formed a party opposed to the above-mentioned archbishops. Joseph II. could no longer support the latter, on account of the dissatisfaction of his own subjects, and, after his death, in 1790, the old state of things was restored, and the power of the pope became firmer than before, until the French revolution changed the face of Europe. At present, the nuncios at Munich and Vienna can do nothing without the consent of the courts, and, in Austria, every clergyman is prohibited from transacting business with the pope through his nuncio. The nuncio in Lucerne, restored in 1803, enjoys the greatest remains of a power incompatible with the advancement of civilization. See *Internuntius*.

NUNIA; a village of Irak Arabi, on the east side of the Tigris, opposite to Mosul; supposed to be on the site of the ancient Nineveh. Here are mounds similar to those of Babylon. The first is about a mile from Mosul, and is nearly a mile in circuit. The second, considerably higher, but less extensive, is crowned by a building with a cupola, and is said to be the tomb of the prophet Jonah, and is visited by the Jews as a place of pilgrimage. Similar mounds may be traced farther up for several miles.

NUNS. See *Monasteries*.

NUOVO (Italian for *new*) appears in many geographical names.

NUREMBERG, formerly a free imperial city of Germany, famous, in the middle ages, for its extensive commerce, situated in the ancient circle of Franconia, was given to Bavaria by the act of the German confederacy, and taken possession of September 15, 1806. It had, in 1822, 31,660 inhabitants within the walls: the suburbs contain 5770. The small river Pegnitz divides the city into two parts; lon. 11° 4′ 23″ E.; lat. 49° 26′ 55″ N. The inhabitants are mostly Lutherans. Like Pisa (though not to the same degree), Nuremberg is distinguished for traces of ages long gone by—monuments, churches, houses, which remind the beholder of ancient times, and render it, for every lover of history, and particularly for every German, a peculiarly interesting place. The ancient castle, on a hill, contains the public gallery of pictures, with many paintings on glass. The city hall, 275 (German) feet long, is a famous building, in which many pictures of Albert Durer are still preserved. The Gothic church of St Lawrence, the beautiful church of St Sebaldus, with the exquisite bronze cenotaph, the church of St James, and the restored church of St Giles, the arsenal, and other buildings, are ornaments to the city. The library of the city is considerable; the high school good. It has a polytechnic school, a conservatory of antiquities and Nuremberg works of arts, and an academy of fine arts. Before the passage to the East Indies round the cape of Good Hope was discovered, Nuremberg was one of the greatest commercial places in the world, as it was the great mart of the produce of the East, coming from Italy, and going to the north. But the change in the commercial world, the devastations of the thirty years' war, and the antiquated institutions of the city, put a stop to her prosperity. Yet the manufactures of the place are still very considerable: it manufactures brass, steel, and iron wire and wares, looking-glasses, musical instruments, maps, engravings, &c. The toys made here go to all parts of the world, as the frugal habits and great industry of the inhabitants, assisted even by young children, enable them to make them very cheap. The income of this once imperial city is valued at 800,000 florins. She possessed a territory of about 490 square miles, with 40,000 inhabitants. Information respecting her former history and works of art is to be found in the *Nürnbergisches Taschenbuch* (2 vols., 1821 and 1822), of which *Der Sammler für Kunst und Alterthum* (1824 et seq., with engravings) is a continuation. The society of artists and friends of the arts are publishing a work called *Die Nürnberger Künstler, geschildert nach ihrem Leben und Wirken*.—Nuremberg gingerbread is famous among the boys and girls of Germany.

NUTATION (from the Latin *nutatio*) of the axis of the earth. In the article *Precession of the Equinoxes*, the reasons are given why the axis of the globe undergoes annually a change of position of about 50″, on account of the irregularity in the attractions of the sun and moon, occasioned by the spheroidal form of the earth. Of these 50″, 30″, on an average, are referrible to the attraction of the moon. But she cannot produce this effect regularly, on account of her own change of position; and there result from these changes not only inequalities in the quantity of the precession of the equinoxes, but also a small motion or *nutation* in the axis of the earth, or in the plane of the equator, in consequence of which the stars appear sometimes to approach the equator, at other times to recede from it, varying from their mean place about nine seconds and a half. This apparent change in the declination of the stars was first discovered by observation by Bradley, and the physical causes of it were explained by D'Alembert and others. It is obvious that a change in the position of the moon towards the earth must produce a change in the attraction of the moon upon the spheroidal part of the earth. Now, this position is affected considerably by the change in the situation of the moon's nodes, which are subjected to an annual motion of about 18°, completing a revolution round the heavens in about eighteen or nineteen years. In consequence of this, the position of the moon's orbit to the equator can vary 10°, and the change in the attraction of the moon on the spheroidal part of the earth, arising from this change of inclination, produces the nutation of 9½ seconds, the period of which is about eighteen or nineteen years. The precession and nutation alter the right ascensions, declinations, and longitudes of the heavenly bodies; the latitudes remain unchanged. D'Alembert (in his *Recherches sur la Précession des Equinoxes et sur la Nutation* (Paris, 1749, 4to) and Laplace (*Mécanique Celeste*) have succeeded, by analysis, in reducing all these intricate phenomena to the law of gravity with the most complete success, and the corrections, calculated thereupon, and contained in the astronomical tables, agree most perfectly with observations.

NUTGALLS. See *Gall*, *Gall Fly*, and *Gallic Acid*.

NUTHATCH (*sitta*, Lin.); a genus of birds somewhat allied in their habits to the woodpeckers. They are distinguished as follows:—Bill moderate, very hard, conic-subulate, subrounded, a little compressed, straight, edges sharp, mandibles equal, lower usually having a small angle; nostrils basal, orbicular, open, half closed by a membrane, and covered by bristly feathers; tongue short, cartilaginous, bony, and jagged at tip; feet robust, hind-toe elongated; wings moderate; tail rather short, having twelve feathers, rounded at tip. The sexes are similar, and the young differ but little from the adults. These birds are found in all cold and temperate climates. They are generally solitary, live in woods, climbing the trunks and branches of trees in pursuit of insects, which are their principal food, though, when these are scarce, they will eat nuts and fruit. It is from their ability in cracking nuts that they have obtained their various common names.

NUTMEG. The use of this fruit for culinary purposes is well known, and is now every where familiar throughout the civilized world. With the East Indians it is, besides, employed as a masticatory. It does not, however, appear to have been very anciently known, at least among Europeans; for the Greeks and Romans have left no account of it, and it is first mentioned by the early Arabian writers.

The tree (the *myristica moschata* of botanists) is a native of the Molucca islands, and is remarkable for the beauty of its foliage. It attains the height of about thirty feet, and the branches are disposed four or five together, almost in whorls, forming a rounded and very dense summit. The leaves are alternate, petiolate, smooth, oval-lanceolate, of a fine green colour above, and paler beneath. The flowers are diœcious, small, yellowish, and inconspicuous. The fruit is a drupe, about as large as a peach, smooth externally, and yellow when it arrives at maturity: the outer envelop is fleshy, and opens at the summit into two valves, disclosing the scarlet mace, which forms the second envelop: the mace is a fleshy, fibrous membrane, having a reticulated appearance, which turns yellow with age, and becomes brittle when dry: the third envelop is thin, hard, and blackish-brown: the nut, or, more properly, kernel, consists of a very firm, white, oily substance, penetrated with numerous irregular branching veins. The tree constantly bears flowers and fruits of all ages, and its leaves fall so insensibly that the loss is not perceived. About nine months are required to bring the fruit to maturity. Mace is very commonly employed as a culinary spice, and resembles the nutmeg in taste and odour, but is more pungent and bitter.

For a long time, the Dutch had the monopoly of the commerce in nutmegs; but, about the year 1770, it was introduced into the Isle of France, and thence passed into Surinam, the West Indies, and other parts of tropical America.

NUTRITION. See *Aliment*, *Chyme*, and *Dyspepsia*.

NUX VOMICA (*strychnos nux-vomica*); an East Indian tree of moderate size, belonging to the natural family *apocineæ*. All parts of the plant are bitter, but not milky. The leaves are opposite and entire; the corolla monopetalous and tubular, surrounding five stamens and a single style. The fruit is globular, about as large as an orange, and contains several seeds. These seeds are circular, flat, with a prominence in the middle on both sides, of a gray colour, and covered with a woolly substance, but, internally, hard and horny. They have been long known in commerce under the name of *vomic nuts*, and it has been pretended that they may be taken by men with impunity, although an exceedingly violent poison to other animals. Experience has not borne out this assertion, and it is now generally rejected from the *materia medica* as a deleterious drug. The seeds are, however, employed in the distillation of ardent spirits in many places, and are frequently used for poisoning noxious animals.

NY (Danish and Swedish for *new*) appears in many geographical names, as *Nyland* (Newland).

NYÈVRE; a department of France. See *Department*.

NYL-GHAU, (*Antilope picta*), in zoology; an animal brought from the East Indies, and described for the first time by doctor Hunter. In size it seems to be a mean between black cattle and deer, and in its form there is a mixture of resemblance to both. Its body, horns, and tail are not unlike those of a bull, and the head, neck and legs are very like those of a deer. The colour, in general, is ash or gray. The height of the back is about four feet, and the trunk, from the root of the neck to the pendulous tail, is about the same length: the horns are seven inches long, and of a triangular shape. It eats oats, is fond of grass and hay, and still more so of wheat bread. It is vicious and fierce in the rutting season, but at other times tame and gentle. The female differs much from the male, is shorter and smaller, resembles the deer, and has no horns. The young nyl-ghau is like a fawn.

NYMPH, in natural history; another name for the *pupa chrysalis*, or *aurelia*; the second state of an insect passing into its perfect form.

NYMPHS; youthful demi-goddesses of the Greeks. Begotten by Oceanus, or by Jupiter and others, with his daughters (Oceanides), they preserve and nourish the woods, rivers, springs, and mountains. They are therefore distinguished according to their offices, as Leimoniades, for example, nymphs of the meadows; Dryades, or Hamadryades, wood-nymphs; Oreades, or Orestiades, mountain-nymphs: these, dressed lightly, as huntresses, were the companions of Diana: there were also Naiades, who presided over fountains, Potamides, over rivers, Limniades, over lakes, Nereides, over seas, Napææ, over vales, &c. They were also named from the places where they dwelt—Dodonian, Corycian, Nysæan, Dictæan, Nysiades, &c., for example. They are all females, holding a middle station between gods and mortals, and, without being immortal, they yet live longer than is permitted to man. The crow, says Hesiod, lives nine times longer than a man, the stag four times longer than the crow, the raven three times longer than the stag, the phœnix nine times longer than the raven, and the nymphs nine times longer than the last. At their death, the substance which they have supplied with nourishing moisture perishes also. This first notion of nourishment, which is supposed in the very idea of a nymph, seems to have given origin to the second representation of them as nurses of young children intrusted to their care. Thus they are said to have educated Bacchus, Æneas, and even Jupiter. Their occupations and diversions are hunting, dancing, and female labours, to perform which, they sometimes assemble in grottoes. Like other spirits of the elements, they possess the power of divination. The fountains of certain Naiades, moreover, possess the gift of inspiration. The poets and artists of antiquity represent them in the beauty of youth, clothed in light garments, sometimes in company with Diana, and sometimes dancing with Venus and the fawns. The nymphs of the water are often represented merely with an urn or pitcher. From the great consequence which nymphs possess as local goddesses, frequent sacrifices are offered to them. Oil, milk, sheep, lambs, goats, wine, and flowers, were sacrificed to them. The *nymphæa* (splendid houses near baths) were also sacred to them.

NYSTADT, PEACE OF, September 10, 1721. See *Northern War*.

O

O; the fourth vowel and the fifteenth letter in the English alphabet, pronounced by pointing the lips, and forming an opening resembling the letter itself: the (so called) *open o* is pronounced with less pointed lips. In proportion as the lips are more opened, the sound passes over into that of *a* (pronounced as in *father*.) In proportion as they are less pointed, yet remain projected, the sound passes over into that of *u*; a consequence of which is, that *o*, in various dialects, passes over into *a* and *u*, also into *e* (pronounced as in *met*.) The English language designates not less than four sounds by the character *o*, exemplified in the words *no*, *move*, *nor*, *not*, whilst there exist, on the other hand, other ways of denoting some of these sounds, as *au*, *eau*. The French indicate the sound *o* (pronounced as in *no*), by various signs. In German, there is only a long and a short *o*, and no way of designating these sounds, but by the letter itself; in Italian, an open and a close *o*. The case is very similar with the other languages of western Europe. The Greeks, it is well known, had two different signs for the long and the short *o*, the ο (*omicron*, or short *o*) and ω (*omega*, the long *o*; see *Omega*.) In the article *A*, it was said that *a* (as in *father*) was used more than any other letter to express various and even opposite emotions. The use of *o* is next in frequency to that of *a*: it is used particularly to express admiration, warning, pity, imploring; and, in general, as introductory to language expressive of great emotion. In all languages, the interjection *O* is to be found; in Greek. ὦ, ἰὼ; in Latin, *O oh*. *O!* and *oh!* are the common forms in modern languages. The Romans change the Greek syllable *os* into *us*; and the Italians again made of *us* and *um*, *o* (see the article *M*); *bonus*, for instance, they made *bono*: the same change often takes place in Spanish.

O in inscriptions signifies *optimus*; as, *I.*, or *D. O. M.*, *Jovi*, or *Deo Optimo Maximo*, the frequent inscription on temples; *O. P.*, *optimo principi*. *O* also is, on many coins, the initial of places and persons.

O is the name given to the nine anthems which are sung in the Catholic church nine days before Christmas.

O, with an apostrophe after it, signifies *son*, in Irish proper names; as, *O'Connell* (the *son of Connell*), like the prefix *Mac*.

In French geography, *O* stands for *ouest*, that is, *west*; in German, for *ost*, that is, *east*.

In masonry it is used for *Orient*.

As a numeral, it signified 70 with the Greeks; and in middle Latin, it signified 11; with a dash over it, 11,000, according to the verse,

O numerum gestat qui nunc extat undecimus.

O, in several words of the Northern languages, has the force of the Greek α (*privative*), having originated from the negative syllable *un*, as *otrogen* (in Swedish), faithless; *osmaklig*, tasteless.

O, in Hungarian, signifies *old*, which is added to many geographical names, in contradistinction to *ui* (new).

OAK (*quercus*). Among the most useful of the productions of temperate climates are the different species of oak, truly the pride of the northern hemisphere, to which part of the globe they are almost exclusively confined, with the exception of a few on the mountainous parts of the equatorial regions. They are shrubs, or trees, many of them of the largest size. More than eighty species are known. This genus belongs to the natural family *amentaceæ*. The leaves are alternate, simple, either entire, or, more commonly, incised, or lobed. The flowers are monœcious, inconspicuous, and the sterile ones are disposed in loose aments. The fruit consists of an ovoid nut, included at base by the cup-shaped, persistent involucrum. The common European oak (*Q. robur*) is a tree of the first consequence, on account of the qualities of its wood. It attains the height of from 60 to 100 feet, with a trunk six to twelve, or more, in circumference. The wood is superior in solidity and durability to any other in Europe, and is employed for a vast variety of purposes, and, above all, for ship-building; indeed, it is the chief reliance of the European navies. Before the introduction of mahogany, it was very generally used for furniture, and, besides, furnishes the best fuel. Except in the north of Russia, the bark is exclusively employed, throughout Europe, for tanning; and that from the small branches is preferred, because the epidermis is thinner, and the cellular integument, which contains the tannin, is more abundant. In ancient times, the acorns formed an important article of nutriment to some of the northern nations, and, among others, to the former inhabitants of Great Britain.

OAKUM; the substance into which old ropes are reduced when they are untwisted, loosened, and drawn asunder. It is principally used in calking the seams, tree-nails, and bends of a ship, for stopping or preventing leaks.

OAR; a long piece of timber, flat at one end, and round or square at the other, used to make a vessel advance upon the water. The flat part, which is dipped into the water, is called the *blade*, and that which is within the board is termed the *loom*, whose extremity, being small enough to be grasped by the rowers, is called the *handle*. To push the boat or vessel forwards by means of this instrument, the rowers turn their backs forwards, and, dipping the blade of the oar in the water, pull the handle forward, so that the blade, at the same time, may move aft in the water. But since the blade cannot be so moved without striking the water, this impulsion is the same as if the water were to strike the blade from the stern towards the head: the vessel is therefore, necessarily moved according to the direction. Hence it follows, that she will advance with the greater rapidity, by as much as the oar strikes the water more forcibly; consequently, an oar acts upon the side of a boat or vessel like a lever of the second class, whose fulcrum is the station upon which the oar rests on the boat's gunwale.

OASIS (*Coptic*, an inhabited place); a fertile spot, situated in the midst of the uninhabitable deserts of northern Africa: the name is also applied to a cluster of verdant spots. They serve as stopping-places for the caravans, and often contain villages. In the desert of Sahara there are thirty-two of these regions which contain fountains, and date, and palm-trees: twenty of them are inhabited. Those of the Libyan desert are the following:—the Great Oasis, of which the principal town is El Kargeh; it consists of a number of insulated spots, extending, for about a hundred miles, in a line parallel with the Nile; it is the first stage of the Darfour caravan, and it contains interesting ruins:—the Little Oasis, or that of El Wah, or El Kassar, of which the best account has been given by Belzoni; the Northern Oasis, or that of Siwah (29° 12′ N.; lon. 26° 6′ E.), inhabited by a population of about 8000 souls, and supposed by some to contain the ruins of the temple of Jupiter Ammon:—the Western Oasis (lat. 20° N.), first visited by Edmondstone in 1819, is composed of twelve villages.—See his *Journey to the Oäses of Upper Egypt* (London, 1823); see also the Travels of Browne, Henniker, and Caillaud.

OAT (*avena*). The species most commonly cultivated is the *A. sativa*, a grass, bearing a few large flowers, which are disposed in a loose panicle, frequently inclined in one direction. The calyx consists of two valves, enclosing several florets, bearing on their outer valves a twisted awn. The seed is oblong and pointed at each extremity. Another species, the *naked oat* (*A. nuda*), differing only in not having the seed adherent to the floral valves, and perhaps only a variety, is also frequently cultivated. The native country of these two species, like that of our other cultivated grains, is entirely unknown. They succeed only in cold and moist climates, and the seed is employed indifferently for the same purposes. The meal is nutritious, and, in some countries, forms an important article of food; the bread made of it is of a good quality, and is extensively used in Scotland. Beer is made from this grain in Britain and Poland; and it is, besides, distilled to procure ardent spirits. Oats are the best food for horses, and for this purpose are principally cultivated. They are also recommended as a good winter fodder for sheep, a handful to be given daily.

OATES, TITUS. This infamous character was born about 1619. He was the son of an Anabaptist preacher, and was educated at Merchant Tailors' school, whence he removed to Cambridge, and afterwards took orders. In 1677, he pretended a conversion to the Roman Catholic religion, and was admitted into the society of Jesuits; but subsequently declared himself a Protestant, and, in conjunction with one doctor Tonge, gave information of a pretended popish plot, for the destruction of the Protestant religion, and falsely accused the Catholic lords Petre, Powis, Bellasis, Arundel of Wardour, and other persons of quality, of being concerned in the conspiracy, several of whom, including lord Stafford, were executed. Such was the credulity of the times, that he was rewarded with a pension of £1200 per annum, and lodged, for safety, at the palace of Whitehall. On the accession of James II., however, he was thrown into prison, and indicted for perjury; and, being convicted, was sentenced to stand in the pillory five times a year during his life, and to be whipped from Aldgate to Newgate, and thence to Tyburn; the last part of which sentence was executed with great severity. At the revolution, the current of popular prejudice again setting in in his favour, he was rewarded with a pension of £1000 per annum. In 1698, he sought to be restored to the congregation of Anabaptists, to which he had at first belonged; but in the course of a few months he was excluded, as a hypocrite and disorderly person. He died in 1705. In early life, he had been chaplain on board the fleet, from which he was dismissed for unnatural practices. See *Popish Plot.*

OATH (in Latin, *jusjurandum*, *juramentum*); a solemn assertion or promise, with the invocation of God to be a witness of the truth of what we say; hence the end of the judicial oath—"So help me God." Such an invocation is of very early origin, it being the most natural and solemn confirmation of the truth of what is said. Some sects consider oaths altogether as a violation of the command of Christ, "Swear not at all;" but this is not the proper place to discuss that point; the reader will find it treated in many works on moral philosophy, for instance, Paley's. Such a solemn invocation, however, should obviously be reserved for important occasions. The custom-house oaths, so numerous in Britain, can hardly fail to diminish the character of sacredness and obligation belonging to such a promise.

The obligation of an oath is variously considered by different religions and sects: some consider oaths binding even if the promise be, in itself, criminal, or has been extorted by extreme fear. The Greeks connected the idea of awful solemnity with an oath. In the middle ages, oaths were enormously abused, and, at the same time, most superstitiously observed. In that period, oaths were often obtained by fraud, and the promiser, nevertheless, considered himself absolutely bound by them. William the Conqueror, when he made his prisoner Harold swear to aid him in ascending the throne of England, "secretly conveyed under the altar, on which Harold agreed to swear, the reliques of some of the most revered martyrs; and, when Harold had taken the oath, he showed him the reliques, and admonished him to observe, religiously, an engagement, which had been ratified by so tremendous a sanction."—*Hume*, vol. i.

The pope is believed, by the Catholics, to have authority to absolve from the obligation of an oath; and this is a natural consequence of the papal attributes. In the middle ages, this gave him a fearful power.

In civil law, oaths are divided into two classes: 1. oaths by which something is asserted as true (*juramentum assertorium*), either because we know it from our own observation (*juramentum veritatis*), or because we consider it true after full investigation, or, at least, have no reason to doubt the fact (*juramentum credulitatis seu ignorantiæ*). Most oaths, in the forms of judicial process, are *juramenta assertoria;* for instance, the oath of a party that he has good cause to ask a delay of trial; also the oath offered by one party to the other, for the settlement of a fact in dispute (*juramentum delatum*); and the oath of valuation, by which a party asserts that he estimates the damage which he has suffered at such a rate. 2. The second class of oaths are the *juramenta promissoria*, by which we promise something: such are the oaths of princes to rule constitutionally, or to protect such a sect or interest, &c.; the oath of allegiance; the oath of office; the oath of witnesses, if they take an oath before testifying. Oaths to perform illegal acts do not bind, nor do they excuse the performance of the act. Perjury is the wilful violation of an oath administered by a lawful authority to a witness in a judicial proceeding. The breach of a promissory oath, whether public or private, is not punishable as perjury.

OAXACA; formerly, an intendancy in the vice-royalty of New Spain; at present, one of the states of the Mexican confederacy, comprising the greater part of the isthmus of Tehuantepec, between the gulf of Mexico and the Pacific ocean. It has the state La Puebla on the west, that of Vera Cruz and that of Tabasco on the east. The climate is healthy, and the soil fertile. The finest fruits, cotton, sugar, indigo, and wine, are among the productions. The mulberry tree was formerly extensively cultivated, and silk was produced in large quantities; but the natives, exasperated by the treatment of the Spaniards, extirpated it. Gold and silver abound. The cochineal plant thrives here better than in any other part of Mexico. The capital, of the same name, a handsome city, with 24,000 inhabitants, sixty-five miles from the Pacific, is situated in a delightful valley. The population of the state is about 600,000.

OBADIAH, or ABDIAS; one of the twelve minor prophets, who foretells the speedy ruin of the Edomites. The time when he lived is uncertain. Some have supposed him to be the same person as the Obadiah who preserved 100 prophets from the fury of Jezebel; but he probably flourished at a much later period.

OBEAH; a species of witchcraft practised among the negroes, the apprehension of which, operating upon their superstitious fears, is frequently attended with disease and death.

OBELISK (ὀβελίσκος, and ὀβελός). Obelisks belong to the oldest and most simple monuments of Egyptian architecture, and are high four-sided pillars, diminishing as they ascend, and terminating in a small pyramid. Herodotus speaks of them, and Pliny gives a particular account of them. The latter mentions king Mesphres, or Mestres, of Thebes, as the first builder of obelisks, but does not give the time; nor is this king noticed either by Herodotus or Diodorus. It is probable that these monuments were first built before the time of Moses, at least two centuries before the Trojan war. There are still several obelisks in Egypt: there is one erect, and another fallen, at Alexandria, between the new city and the light-house; one at Matarea, among the ruins of old Heliopolis; one in the territory of Fajum, near ancient Arsinoe; eight or ten among the ruins of Thebes; the two finest at Luxor, at the entrance of the temple, &c. These obelisks, exclusively of the pedestals, are mostly from 50 to 100 feet high, and of a red polished granite (sienite); a few of the later ones are of white marble and other kinds of stone. At their base, they commonly occupy a space of from four and a half to twelve feet square, and often more. Some are adorned on all sides, and some on fewer, with hieroglyphics cut in them, sometimes to the depth of two inches, divided into little squares and sections, and filled with paint: sometimes they are striped with various colours. Some are entirely plain, and without hieroglyphics. The foot of the obelisk stands upon a quadrangular base, commonly two or three feet broader than the obelisk, with a socket, in which it rests. They were commonly hewn out of a single stone, in the quarries of Upper Egypt, and brought on canals, fed by the Nile, to the place of their erection. Several learned men have doubted this, and others have sought to prove it; but, according to the accounts of travellers, there are still to be found, in Upper Egypt, old quarries with obelisks already hewn out, or with places whence monuments of this form must evidently have been taken. Of their origin we know nothing with certainty. Perhaps the first images of the gods, which, at an early period, were nothing but stones of a pyramidal form, gave occasion to them. Thus the ancient image of Venus, at Paphos, was a pyramid of white marble. According to Herodotus, they were first raised in honour of the sun, and meant to represent its rays. This is confirmed by their name and their form. They might also have been raised to perpetuate the memory of certain events, since the hieroglyphics contained the praises of their gods and their kings, or inscriptions relating to their religious notions. It is not probable that they were intended for sun-dials, because their point did not throw a distinct shadow. They were afterwards, however, used for that purpose, and balls were placed upon the points of some, as was the case with that which Augustus had brought to Rome, and which he placed in the field of Mars, under the direction of the astronomer Manilius, in such a position that it could be used for a dial. It is well known that, among the ancient Egyptians, they made a principal ornament of the open squares and the temples, before the large gates of which two or more were commonly placed. For this purpose, they used only obelisks of considerable height. After the conquest of Egypt by the Persians, no more were erected, and the successors of Lagus adorned Alexandria with the obelisks of the ancient kings. The Roman emperors carried several of them from Egypt to Rome, Arles and Constantinople, most of which were afterwards overturned, but have been put together and replaced in modern times. Augustus, for instance, had two large obelisks brought from Heliopolis to Rome. One of them we have already spoken of. The other stood upon the Spina, in the Circus Maximus, and is said to have been the same which king Semneserteus (according to Pliny) erected. At the sack of Rome by the barbarians, it was thrown down, and remained broken, in three pieces, amidst the rubbish, until, in 1589, Sixtus V. had it restored by the architect Domenico Fontana, and placed near the church Madonna del Popolo. Under Caligula, another large obelisk was brought from Heliopolis to Rome, and placed in the Circus Vaticanus. It has stood, since 1586, before St Peter's church: it is without hieroglyphics; and, with the cross and pedestal, measures 126 feet in height. It is the only one in Rome which has remained entire. Its weight is estimated at 10,000 cwt. Claudius had two obelisks brought from Egypt, which stood before the entrance of the Mausoleum of Augustus, and one of which was restored in 1567, and placed near the church of Santa Maria Maggiore. Caracalla also procured an Egyptian obelisk for his circus, and for the Appian Way. The largest obelisk (probably erected by Rameses) was placed, by the emperor Constantius II., in the Circus Maximus at Rome. In the fifth century it was thrown down by the barbarians, and lay in pieces upon the ground, until Sixtus V., in 1588, had it raised upon the square, before St John's church of the Lateran, thence called the *Lateran obelisk*. It is beautifully adorned with sculpture. Its weight is more than 13,000 cwt; its height, exclusive of the pedestal, 140 feet; with the pedestal, 179. Several others have been erected by succeeding popes. The famous obelisk, called *Cleopatra's Needle*, was presented by the pacha of Egypt to the king of England, in 1820. It was erected in Waterloo place, in London.—See Zoega, *De Origine et Usu Obeliscorum*, etc. (Rome, 1797, seq.). Champollion, Jr., has published, in Rome, copper-plate engravings of obelisks, with his explanations of the hieroglyphics. A. Fea has written a history of these monuments, with an account of their erection, to accompany Champollion's work.

OBER; German for *Upper*, appearing in innumerable German geographical names.

OBERKAMPF, CHRISTOPHER PHILIP; the founder of the manufacture of printed linens of Jouy, and of the cotton manufacture of Essonne, in France. He was born in 1738, in the territory of Anspach, in Germany, and was the son of a dyer, who, after exercising his occupation in several parts of Germany, had taken up his residence at Arau, in Switzerland. Young Oberkampf, having acquired the art of making printed linens, quitted his father at the age of nineteen; and, two years after, he commenced, on a small scale, a manufactory in the valley of Jouy. The design of the figures, the printing and the dyeing of the goods, were all performed by himself; and, in spite of various difficulties with which he was surrounded, he acted with such spirit and perseverance, that, in the progress of time, he collected a population of 1500 persons in a spot which had been almost a desert, and, by the supply of printed linens at home, put an end to the importations of those articles into

France. Louis XVI. conferred on Oberkampf letters of nobility; and, in 1790, the council-general of the department decreed him a statue, which mark of gratitude, however, he declined. In 1793 his life was in danger, but he escaped proscription. Some years after, he was offered a place in the senate, which he refused; but he accepted the cross of the legion of honour, bestowed on him by Bonaparte. Oberkampf, in the latter part of his life, established a cotton manufactory at Essonne, and thus naturalized that important branch of industry in France. The commotions which accompanied the overthrow of Bonaparte had a disastrous influence on the manufactories of Jouy, and deeply afflicted the mind of the proprietor, whose death took place, October 4, 1815.

OBERLIN, JEREMIAH JACOB, professor and librarian in the university at Strasburg, born in 1735, was, in 1750, among the number of the students of this university, and defended, in 1754, his Dissertation Concerning the Burials of the Ancients, by which he obtained the degree of doctor. After he had finished his philological and philosophical course, he studied, for three years, the philological and antiquarian department of theology, and then turned his attention to languages, literature, archæology, history, and diplomatics. He began his career as teacher in the gymnasium and adjunct in the library of his native place, and was transferred to the university, after he had extended his knowledge and reputation by his travels. The revolution drew Oberlin from his literary activity into the bustle of political life. He suffered an imprisonment at Metz; but, after tranquillity was restored, he returned to his former course. He died at Strasburg, in 1806. His editions of some works of Ovid, Horace, Tacitus, and Cæsar, are valuable. We will mention his *Miscella. literaria Argentoratensia*; *Museum Schoepflini* (1st vol.: the 2nd vol. of which has never appeared); *Orbis antiqui Monumentis suis illustrati Prodromus*; *Rituum Romanorum Tabulæ*; *Artis diplomaticæ primæ Lineæ* (the last mentioned elementary works served him as a guide in his academical instructions); *Literarum omnis Ævi Fata, Tabulis synopticis exposita* (these tables give the names of the most eminent writers, the subjects on which they wrote, the nation to which they belonged, and the age in which they lived); *Essai d'Annales de la Vie de Jean Guttenberg, Inventeur de la Typographie.* The study of the German language of the middle ages occupied his attention also, and induced him to give an edition of J. G. Scherzii, *Glossarium Germanicum Medii Ævi, potissimum Dialecti Suevicæ*, (2 vols., folio). He also produced the first sketch of the statistics of the former Alsace, having published, from 1782, for the space of ten years, the Alsatian Almanac and the *Alsatia Literata*, for which Schoepflin furnished him with materials. The two first volumes appeared in 1782 and 1786.

OBESITY. See *Corpulence*.

OBJECT, in grammar and philosophy, is opposed to *subject*, which, in philosophy, designates the being who conceives, thinks, or knows the object. The subject is the conceiving, thinking, knowing; the object, the conceived, thought, known. Every subject may become an object. If A thinks or conceives the thing O, A is the subject, O is the object; but if I conceive A thinking of O, both are the object, and I the subject. *Objective*, therefore, is used in modern philosophy, particularly by the Germans, for that which truly belongs to an object; *subjective*, for the manner in which an object is conceived of by an individual subject. In the same way, *objectivity* is used to denote the existence of things without us, independently of our ideas of them. It is well known that some philosophers deny this objectivity. There is a great difference between an objective and a subjective knowledge or representation of a thing: the former is the knowledge or representation of the thing as it really is, independently of the impression which it makes upon the individual character of the subject; the latter is limited to this. He who describes objectively, shows us the things as they are, free from the bias of his own partialities and prejudices, springing from his education and habitual associations. Such a spirit should be the great aim of an historian. Some works, particularly in belles-lettres, however, derive their great charm from their subjectivity; i. e. from giving us only the impression made upon the narrator, if he be an individual of a peculiar character, describing things with which we are already acquainted. But the great question arises, What is objective truth? All knowledge has been attained by individuals, and takes its character from the impressions made by the object upon the subject; hence all truth is subjective. Still we may say, that what appears to all reasoning subjects, almost without exception, as right and true, has the value of objectivity. But, as we find on no subject, not even the fact of man's existence, a perfect concurrence of opinion, it is obvious that objective truth cannot be fully obtained. "Here we see through a glass darkly, but there face to face;" i. e. we shall attain to objective truth, and know things as they are. In the fine arts, it is of the first importance that the artist should be objective, i. e. represent things and ideas free from partial, contracted conceptions. On the other hand, his subjectivity is not to be lost in the objectivity of his work; on the contrary, the work should bear the impression of his individual character, but its individuality must be beautiful. We know not a more opposite example of such a character than Shakspeare. Who represents things, men, virtues, and vices, more objectively, impartially depicting even vices and crimes with perfect calmness? and whose works, on the other hand, bear more the impress of unequalled genius and individuality than his? The other extreme is the works of young poets, who torment their readers by the constant protrusion of their own partial views.

OBJECT-GLASS, in optical instruments, is that which is placed towards the object: the other extreme lens is the *eye-glass*, being that to which the eye is directed.

OBJECTIVE. See *Object*.

OBLATE (flattened or shortened); having its axis shorter than its middle diameter, being formed by the rotation of an ellipse about the shorter axis. The earth is an oblate spheroid, the polar diameter being shorter than the equatorial diameter in the proportion of 331 to 332; i. e. the polar diameter is 7900 miles, and the equatorial diameter 7924 miles.

OBLATI; lay-brothers. See *Orders, Spiritual*.

OBLIGATION. The name of *obligations* is sometimes given to public stocks, because the government promises to pay under such and such circumstances.

OBLIGATO (*Italian*, required), in music, is used of those voices or instruments which are indispensable to the just performance of a piece. An instrument may be *obligato* throughout a piece, when it is called a *concerto* for such an instrument; or an instrument may become now and then *obligato*, when these passages are called *obligato* or *solo* passages. All instruments can be used *obligato*, except, perhaps, the double bass: this is excepted partly because solo players are very rare on this instrument, partly because the solo voice would be too deep for being duly supported by other instruments; it is, therefore used more properly for the basis of harmony. There are some musicians, however, who play solos on the double bass.

OBOLUS; a Grecian coin of silver or copper, the sixth part of a drachm, about 10¾ pence in value. In early times, instead of money were used little pointed pieces of iron, or of copper (ὀβολος, ὀβελος, a spit). Six of these filled the hand, and made a drachm. The same name was afterwards given to a small silver coin. The Greeks placed an obolus in the mouth of the dead, to pay Charon for their passage over the Styx. In weight, the obolus is likewise the sixth part of a drachm; the latter coin, however, is not always of the same value.

OBOTRITES; a Vandal tribe. See *Vandals*.

OBSCURANTISM (from Latin *obscurare*); a word not unaptly used in Germany to denote the endeavours of certain men to prevent the diffusion of intelligence. It is used in science as well as in religion, and might very properly be applied in politics.

OBSERVANTS. See *Franciscans*.

OBSERVATORY; a building constructed for astronomical observations, from which there is an unobstructed view of the heavens, and in which the instruments are safe from agitation and other disturbances. There are, for instance, large astronomical telescopes, always placed in the direction of the meridian, and the internal arrangement of the building is such as to facilitate the observations; the roof is also flat, to favour the view to the horizon. The instruments in an observatory are quadrants, sextants, and octants, transit, equatorial, parallactic, and circular instruments, achromatic and reflecting telescopes, night and day telescopes, chronometers, compasses, &c. We find mention of observatories at a very early period: Diodorus (ii. 9) tells us of a tower, from which the Chaldæan astronomers made their observations, in the temple of Belus, at Babylon. Copernicus was the first who (1540) set an instrument in the meridian. The first regular observatory was erected at Cassel in 1561. Among the modern European observatories, the most celebrated are those of Paris (erected in the reign of Louis XIV., 1664—72), of Greenwich (built in 1672), and of Palermo (erected by Piazzi, 1789). That on the Seeberge, near Gotha, has acquired celebrity through Zach (q. v.), and that of Konigsberg through Bessel; of the latter Bessel has given an account in his *Beobachtungen auf der Universit-Sternwarte* (1814 seq). There are also similar establishments at Amsterdam, in Batavia, at Berlin, Bologna, Breslau, Cambridge, Cape-town, Dublin, Edinburgh, Florence, Genoa, Gottingen, Hamburg, Copenhagen, Leipsic, Leyden, Lilienthal (near Bremen), Lisbon, Milan, Manheim, Marseilles, Moscow, Munich, Naples, Nicolaieff, Oxford, Padua, Petersburg, Pisa, Plymouth, Portsmouth, Prague, Rome, Slough (Herschel's), Stockholm, Toulouse, Upsal, Vienna, &c. China is indebted to the Jesuits for one at Pekin, erected towards the end of the seventeenth century; and another has been built at Paramatta, in New South Wales. Although observatories are generally provided with numerous and costly instruments, yet for most purposes, a meridian circle of two, or at most three feet diameter, a four or five feet telescope, and a good clock, are sufficient.

OBSIDIAN. See *Pitchstone*.

OCANNA. See *Colombia*.

OCCAM or OCKHAM, WILLIAM, an eminent philosopher of the fourteenth century, a native of Ockham in Surrey, was educated at Merton college, Oxford. He studied under the celebrated Duns Scotus, whose opinions he, notwithstanding, controverted, becoming the founder of the philosophical sect of the Nominalists, as Scotus was of the Realists. Occam entered into the Franciscan order of Friars Minor, or Cordeliers; and he also took orders in the church, and became archdeacon of Stowe, in the diocese of Lincoln, which preferment he resigned about 1320. He wrote against pope John XXII., whom he treated as a heretic, and joined the anti-pope Nicholas V., set up by the emperor Louis of Bavaria. He died at Munich in 1347. He was well acquainted with the Scriptures, and with the philosophy of Aristotle, and possessed a subtle genius and much eloquence. Among his works are *Commentarium super Sententias* (lib. iv.); *Quodlibeta*; *De Ingressu Scientiarum*; and a treatise against the pope, *De Paupertate Christi et Apostolorum*. He obtained the title among the schoolmen, of the *Invincible Doctor*. See *Nominalists* and *Scholastics*.

OCCASIONAL CAUSES. The doctrine of occasional causes was developed in the school of Descartes. Before him it was considered that the body influences the soul, and causes motions in it, and *vice versa*. This was called *systema influxus physici*. Descartes impugned this indirectly by his dualism, which he reconciled by making God the cause of all motion. Louis de la Forge, his scholar, also makes God the cause of all motion, but considers a mutual connexion to exist between soul and body, so that the one is never moved by God without influencing the other. Genlin developed the system further, and made God the original cause of every motion produced by one of the two parts on the other.

OCCIDENT; a word much used in the historical works of the European continent, in contradistinction to *Orient*; for instance, *Occidental* languages, *Occidental* empire. See *Western Empire*.

Occident, in astronomy and geography, is the same as *westward*, or point of the horizon where the sun sets. A planet is said to be *occident* when it sets after the sun.

OCCULTATION; the obscuration of a planet or star by the interposition of the moon, or other planet, between it and our eye. The name of *immersion* is given to the state of a star or planet, when it is so near the sun as to be invisible; also to that of the moon when she begins to be darkened by entering into the shadow of the earth.

OCCUPANCY, in law. See *Land*, *Property in*; *Natural Law*, and *Public Lands*.

OCEAN; the great mass of waters which surrounds the land, and which probably extends from pole to pole, covering nearly three quarters of the globe. For the sake of convenience, we distinguish different parts of it under the names of *seas*, *bays*, *gulfs*, *sounds*, and even give the name of *ocean* to large portions which are partially divided from each other by the continents. But these divisions are arbitrary. The following classification, adopted by Malte-Brun, in his System of Geography, has, at least, the advantage of showing, in a striking manner, the connexion which exists between the great masses of water.

A. Great Austro-Oriental or South-Eastern Basin.	1. Austral ocean, or Southern Frozen ocean (Antarctic ocean).	Its limits are a line drawn from cape Horn to the cape of Good Hope, by Van Diemen's Land, and the south of New Zealand, back to cape Horn.
	2. Oriental, or Pacific ocean.	*a.* The Great Archipelago (*Oceanica*), comprised between the Austral ocean, the Marquesas, the straits of Malacca, and the latitude of Formosa. *b.* The Northern Oriental Ocean, between Asia and North America. *c.* Southern Oriental ocean, between the Great Archipelago and South America.
	3. Indian ocean.	
B. The Western Basin, forming a sort of channel between the two continents.	4. Western ocean.	*a.* Northern ocean, or Frozen ocean (Arctic ocean). *b.* Atlantic ocean, lying between Europe and North America, and extending south to the nearest points of Brazil and Guinea. *c.* The Ethiopic ocean, between the Atlantic and Austral oceans.

It has been calculated that the land of the northern hemisphere is to the sea of the same as 419 to 1000; in the southern hemisphere, the proportion is as 129 to 1000. To account for this great disproportion, it has been conjectured that there is a great southern continent surrounding the south pole; but the voyages of navigators have not revealed the existence of such an extent of land. The bed of the ocean presents the same irregularities of aspect as the surface of the land. It is diversified by rocks, mountains, plains, and deep valleys. In some places it has been found impossible to reach the bottom; but the notion that it is any where without a bottom is incompatible with the spherical figure of the earth. The mean depth of the ocean has been shown, by Laplace, to be about the same as the mean height of the continents and islands above its surface, which does not much exceed 3000 feet. This distance is but a small fraction of the excess of the equatorial over the polar radius, which is about 60,000 feet. The greatest depth that has ever been sounded is 7200 feet (by Scoresby, in 1819). But it is probable that there are deep cavities or valleys in the bed of the ocean corresponding to the elevation of the mountains on the surface of the earth.

Sea-water is well known to contain foreign substances mixed with it; its saltness and bitterness give it an extremely disagreeable taste. Its specific gravity varies from 1·0269 to 1·0285. The degree of saltness differs according to different localities; but the difference is not very great. In 100 parts of sea-water the greatest proportion of salt is 3·77, and the smallest 3·48. The experiments of Sparmann go to show that the water of the surface, while it is less salt than that at a considerable depth, is much more bitter. Gulfs or inland seas, such as the Baltic, are less salt than the main ocean, on account of the quantity of fresh water poured in by rivers. The polar seas are less salt than the equatorial, owing to the low temperature of the former, which disposes them to deposit the saline substances. Naturalists have endeavoured to account for the saltness of the sea; some have supposed it to be caused by primitive banks of salt at the bottom; but if such banks exist, they have probably been formed by deposits from the water, rather than been the cause of its saltness; others have ascribed it to the corruption of vegetable and animal matter conveyed to the sea by rivers; but if this is true, the saltness would be increasing. Some have conceived the ocean to be the residue of a primitive fluid, which held in solution all the substances of which the earth is composed, and on depositing the others, retained the saline principles which it still contains. The only method of freeing sea-water from its salt is by distillation; and the process is so slow, that it can rarely be applied to any practical purpose. Even after distillation it retains its bitter taste. This bitterness, which renders sea-water so nauseous, probably proceeds from animal and vegetable matter in a state of decomposition. The most common ingredients found in it are muriatic acid, sulphuric acid, soda, lime, and magnesia. These substances in combination may form six salts; but it is not probable that all of these latter actually exist at the same time. They are muriate of soda, or common salt, muriate of magnesia, or Epsom salt, sulphate of soda (Glauber's salt), &c. The saltness of the sea-water does not preserve it from corruption, as is shown by the water in a ship's hold, and sometimes even in the equatorial seas after a long calm. Many substances are corrupted more rapidly by being plunged into it; and its odour, when corrupted, is extremely offensive. It is preserved pure by its constant motion.

The general colour of the sea, in the open ocean, is a deep greenish-blue; the blue tint, which is predominant, seems to proceed from the same cause as the colour of the sky; the blue rays being reflected in the greatest quantity on account of their superior refrangibility. The other shades, which have sometimes been observed in different seas, seem to be owing to local causes, and often, perhaps, to optical illusions. In approaching soundings, the water assumes a lighter shade. The luminous appearance of the sea by night is an imposing and magnificent phenomenon. It has been ascribed by some to animals of the zoophyte and mollusca classes, which are said to possess phosphorescent qualities; some attribute it to the phosphorescence of decaying animal and vegetable substances; others to the spawn of fish. Some have explained it to be the effect of friction. But the appearances are extremely different at different times, and all these causes probably operate to produce them.

Observations made on the temperature of the sea, show that the sun's rays rarely penetrate below the depth of forty-five, or, according to some, of 113 fathoms, below which the sea receives no light, and consequently little or no direct heat from the sun; and that the temperature increases with the depth to a certain degree, but never to freezing. The constant motion of the sea contributes, in some measure, to render its temperature equable. (See *Ice*.) "We must distinguish," says Humboldt, "four different phenomena with respect to the ocean;—the temperature of the water at the surface in different latitudes; the decrease of temperature in the lower strata; the effect of waves on the temperature of the surface; and the temperature of currents. The region of warmest water is between 5° 45′ N., and 6° 15′ S. lat.; and different observations give from 82 to 84 as the maximum. In the parallel of warmest waters the temperature of the surface of the sea is from 3° to 5° higher than that of the superincumbent air." The observations of Humboldt also show that both in the Atlantic and Pacific, in changing the latitude and longitude, the waters often retain nearly the same temperature over a great extent, and that between 27° N. and 27° S. lat., the temperature of the sea is entirely independent of the changes in the atmosphere. From the equator to 25° or 28° N. there is a remarkable constancy of temperature, but in higher latitudes there is more change. See *Temperature*.

The great periodical oscillations of the sea, caused by the attraction of the sun and moon, are treated of in the article *Tides*; the particular movements, which prevail in different parts of the ocean, and set in different directions, are described in the article *Currents*. See also *Winds*.

In some places springs of fresh water are observed to issue from the sea, entirely unaffected by the salt water. The most remarkable of these phenomena are in the gulf of Spezia, in the Persian gulf, and in the bay of Xagua, on the south coast of Cuba. It is probable that these are subterraneous streams, which find their way under the bed of the ocean, until they encounter a fissure, into which they are impelled in the same manner as spouting springs on land.

A variety of plants are nourished by the ocean, to which are given the general denomination of *fuci*, and which are vulgarly known by the names of *sea-weed* and *rock-weed*. Some species adhere to the bottom, while others rise to the surface even from a depth of sixty fathoms. In the North Atlantic there is a space extending between lat. 20 and 40° N., and lon. 20° and 45° W., which is at all seasons covered with a species of weed (*fucus natans*) of a beautiful green colour, whence the Dutch navigators called this tract *Kroos Zee*, Duck-weed sea. (See

Fuci.) The great divisions of the sea appear to be inhabited by their peculiar fish, mollusca, zoophytes, &c., and to be frequented by peculiar species of birds.

The level of the seas is, generally speaking, everywhere the same. This arises from the equal pressure, in every direction, which the particles of a fluid exercise upon each other. The ocean, therefore, considered as a whole, has a spherical or a spheroidal surface, which may be considered as the true surface of our planet. Exceptions to this general rule are often, however, to be found in gulfs and land-locked bays, where the waters become accumulated, and stand higher than in the open ocean. See *Islands;* see also *Atlantic*, *Pacific*, and *Indian ocean.*

OCEANICA (in Malte-Brun's Geographical System); the third great division of the world, comprising all the islands which lie to the south and south-east of Asia in the Pacific ocean, including the Asiatic archipelago, Australia, and Polynesia. The former constitute North-west Oceanica; New Holland, and the large islands lying round it, Central Oceanica; while the remaining islands, forming what is usually called *Polynesia*, constitute Eastern Oceanica.

OCEANIDES; the three thousand daughters of Oceanus and Tethys. We include, under this name, according to the hymns of Orpheus, the whole female posterity of Oceanus, that is, all the goddesses of the streams and fountains flowing beneath the earth from the surrounding ocean; only excepting from the number the Nereids, or nymphs of the Mediterranean sea, although they also, being descended from Doris, one of the Oceanides, have been called by Antipater of Sidon, *daughters of the Ocean.*

OCEANUS; the eldest of the Titans, whose birth is connected with the origin of the sea (*Pontus*). He was born later than Pontus, and surrounded the earth, the vault of heaven sinking towards him on every side. He has therefore been called the son of Gæa (the earth) and of Uranus (heaven.) Oceanus and Tethys were the parents of rivers, and of the race of goddesses called *Oceanides.* According to another account (see Homer's *Iliad*, book xiv. 201, 246,) he was the father of all gods and men. He always appears as a peaceful god, and he took no share in the mutilation of Saturn. He was not, therefore, cast into Tartarus with the Titans. On account of his circumspection and mildness, he was called the *father of wisdom.*

OCHRE. See *Clay.*

OCHTERLONY, SIR DAVID, Bart., major-general in the British East India company's service, was born in Boston, New England, in 1758. At the age of eighteen, he went to India as a cadet, and in 1778 was appointed ensign, and in September of the same year lieutenant on the Bengal establishment. Lieutenant Ochterlony rose by merit through the intervening ranks, and, in 1803, was made lieutenant-colonel. In the Mahratta war of 1803—4, he distinguished himself on several occasions, and, after the great battle of Delhi, was appointed resident at that court. On the restoration of peace, he received the command of the fortress of Allahabad, and, in 1809, commanded a force stationed on the Sutledge, to overawe the Seiks. In 1812, he was promoted to the rank of colonel, and, in 1814, to that of major-general. In the Nepaulese war he commanded a division which was instructed to advance, through a difficult country, against Umer Sing, a brave and experienced warrior, whom he compelled to surrender in the almost inaccessible fortress of Mallown. The chief command was now given to general Ochterlony, who brought the war to a close, September, 1815, after a series of skilful operations and brilliant successes. His services were rewarded, by the prince regent, with the order of knight-commander of the Bath, and the dignity of baronet, and by the East India company with a pension of £1000 per annum. In 1816, Sir David Ochterlony was created knight grand cross of the order of the Bath, and, in 1817, the thanks of the two houses of parliament were voted him for his skill, valour, and perseverance in the Nepaulese war. In 1817, he was invested with large powers for settling the province of Rajpootana. In 1818, he was appointed resident at Delhi, with the command of the third division of the grand army, and, in 1822, was intrusted with the superintendence of the affairs of Central India, as resident and political agent in Malwah and Rajpootana. He died in 1825.

OCRACOKE INLET; an inlet of North Carolina, forming a passage into Pamlico sound; twenty-two miles south-west of cape Hatteras; lon. 75° 59′ W.; lat. 34° 55′ N. On each side of the channel are dangerous shoals; on the bar are fourteen feet at low water.

OCTAGON, in geometry, is a figure of eight sides and angles, which, when the sides and angles are all equal, is called a *regular octagon*, and when they are not equal, an *irregular octagon.*

OCTAHEDRON or OCTAEDRON; a body consisting of eight equal and equilateral triangles.

OCTANT, an astronomical instrument, is the eighth part of a circle, divided into degrees, and used in calculating the amplitude of the stars, but is now little used.

OCTAVE, in the diatonic system of musical sounds; the eighth sound from an assumed fundamental tone. It belongs to the perfect concordant intervals, so that when it is sounded with the fundamental, the ear scarcely perceives more than one sound, and is hardly able to distinguish the one from the other. For this reason, the octave must, in our musical scale, be perfect; whereas the other intervals may be tuned somewhat higher or lower than their true pitch. The upper octave, that is, the one which is eight notes above the fundamental, is obtained when the string which sounds it is only one half as long, and the lower octave when this string is twice as long, as that of the fundamental. The string which sounds the upper octave in each makes two vibrations, while the string of the fundamental makes one. Therefore on the eighth diatonic string the tone of the first, or lowest, recurs. The ninth string repeats the second tone, called the *second*, the tenth string the third tone, or the *third*, &c. According to the arrangement of our new or diatonic system of tones, the octave is therefore the limit within which the seven essential tones are kept distinct from each other; and all tones without the limit of the octave are only repetitions, in an augmented or diminished degree, of the tones already contained in the compass of the octave. For this reason we call the octave the whole extent of the tones of the diatonic system. (See *Tablature.*) The number of upper and lower octaves, or the manner in which several octaves of different heights are to be chiefly distinguished, is not absolutely determined, on account of the continually increasing compass of instruments, particularly stringed instruments, and especially the piano forte, which, within a short period, has been increased a whole octave. The octave, considered as an interval, has, of all intervals, the least harmonic effect. On this account composers, when there is only one principal voice, forbid rising to the octave except at the beginning or close. But a succession of octaves following each other, when a melody is to be raised in that manner, has a very good effect. False or disallowed octaves are, in musical compositions for many voices, progressions of two voices in exact movement by octaves, which offend the ear. The reason why such progressions by octaves are disallowed in a musical piece for many voices, is evident, because, when two voices proceed by octaves, no difference can be perceived between these two; and, for example, a piece for four voices, becomes one for two. There are also those which are called *covered octaves*, that is, such as become for the first time distinguishable when the interval of the two voices, proceeding in an exact movement by octaves, is filled up with unimportant notes. Of the compositions for two voices, or in the two upper parts of composition for three or four voices, those alone are free from fault in which the upper part rises or falls a second, but the fundamental a fourth or fifth. The use of the others is only allowed under the middle part, or between an upper and a middle part. *Octave*, also, in an organ, signifies the open flute stop, which is one or two octaves higher than the principal.

OCTAVIA; daughter of Caius Octavius and of Accia, and sister to the emperor Augustus. All the historians praise the beauty and the noble character of this celebrated Roman lady. After the death of her first husband, Marcus Marcellus, she married the triumvir Marcus Antonius, that she might confirm the friendship existing between him and her brother. But Antony was incapable of duly estimating her virtues; and the charms of Cleopatra, which inflamed his passions, he preferred to the modest beauty of his wife. After her marriage, she followed her husband to Athens, where she passed the winter (B. C. 39) with him, averse from those luxurious pleasures to which he abandoned himself. Without her interposition, civil war would even then have broken out between Octavius and Antony. By urgent prayers she appeased her husband, who was incensed against her brother for his suspicions, and then, disregarding the difficulties of the journey and her own pregnancy, she went, with his consent, from Greece to Rome, and induced her brother to consent to an interview with Antony, and to come to a reconciliation with him. When her husband went to make war against the Parthians, she accompanied him to Corcyra, and at his order returned thence to remain with her brother. New quarrels arose between Octavius and Antony. To have a pretext for a rupture, Octavius ordered his sister to go to her husband, in the expectation that he would send her back. This actually happened. Antony was leading a life of pleasure with Cleopatra at Leucopolis, when letters from Octavia at Athens informed him that she would soon join him with money and troops. The prospect of this visit was so unwelcome to Cleopatra, that she persisted in her entreaties till Antony sent his wife an order to return. Even now she endeavoured to pacify the rivals. Octavius commanded her to leave the house of a husband who had treated her so insultingly; but feeling her duties as a wife and a Roman, she begged him not, for the sake of a single woman, to destroy the peace of the world, and of two persons so dear to her, by the horrors of war. Octavius granted her wish; she remained in the house of Antony, and occupied herself in educating with care and tenderness the children which she had borne him, and those of his first wife, Fulvia. This noble behaviour in Octavia increased the indignation of the Romans against her husband. At last he divorced her, and ordered her to leave his house. She obeyed without complaint, and took with her all her children, except her eldest son, Antillus, who was with his father. Soon after, she witnessed the outbreak of the civil war. She died in the year of Rome 742, twelve years before the Christian era. Augustus pronounced her funeral oration, but refused the marks of honour which the senate were desirous of bestowing on her.

OCTAVIUS, or OCTAVIANUS. See *Augustus*.

OCTOBER (from the Latin *octo*, eight); originally the eighth month in the Roman calendar, whence its name, which it still retained after the beginning of the year had been changed from March to January.

OCTROI or OCTROY, an old French term (from *auctoritas*) signifying a grant or privilege from government, is particularly applied to the commercial privileges granted to a person or to a company. In a like sense the term is applied to the constitution of a state granted by a prince, in contradistinction to those which are derived from a compact between the ruler and the representatives of the people.

Octroi also signifies a tax levied at the gates of some cities in France upon all articles of food.

OCZACOW (*Otschakow*); called by the Turks *Dzain Krimenda;* a town in the Russian government of Cherson, with about 1000 inhabitants, situated on the Black sea, at the mouth of the Dnieper; lat. 46° 36′ N.; lon. 41° 30′ E. It was formerly an important Turkish fortress, with a citadel, the walls of which were twenty-five feet high. In 1737, it was stormed by the Russians, who lost 18,000 men in the attack. The Turks attempted to recover it with a force of 70,000 men, but were repulsed with the loss of 20,000. In 1738, it was given up by the Russians, who had previously destroyed the works. The Turks fortified it anew in 1743, and held it until 1788, when, after a siege of six months, it was stormed by Suwaroff, who razed it to the ground. By the peace of 1791, it was ceded to Russia; but since the rise of Odessa its commerce has become inconsiderable.

ODAHLIC; the name given to the females confined in the harems of the Turkish sultan. See *Harem*.

ODE; a poem of purely lyrical character, or of that class of lyrical compositions which express the feelings of the poet in moments of high excitement, with the vividness which present emotion inspires. (See *Lyrics*.) The Greeks called every lyrical poem adapted to singing, and hence opposed to the elegiac poem, an *ode* (ᾠδὴ, i. e. *song*), from which they did not even separate what the moderns call *songs*. We are acquainted with the Greek odes through the choruses in the Greek dramas, Pindar's heroic odes in praise of the conquerors at the great national games, the few relics of the amatory songs of Sappho, Alcæus and others, the Anacreontic songs, the imitations of the Greek odes by the Romans, particularly Horace, and through the scholia. Whatever was the subject, or the degree of feeling or excitement, every poem was termed an *ode*, provided it was purely lyrical. The name of *odes* was also given to the hymns or praises of the gods (the Homeric hymns excepted, because they are of an epic character), which received different names from the various deities to whom they were addressed; thus dithyrambics were originally hymns in praise of Bacchus. The odes of the ancients are distinguished from the lyrical poems of the moderns, by expressing feeling, according to the prevailing character of antiquity, more by the aid of imagery. The *plastic*, or the clothing of inward conceptions in outward forms, is a chief trait of the Greek art; and, in the same manner, the feeling of the poet expressed itself in a series of striking images. In modern times, odes have been more confined to the simple utterance of feeling; and so far has this been carried, that they have sometimes been divested of all poetic conception. But a naked expression of feelings does not make a poem; and this is the defect of many of Klopstock's odes. In modern times, the ode has been separated from the song, so that *ode* now means that part of lyrical poetry which expresses the deep emotions of the soul, and the alternation of violent and elevated feelings of joy or suffering, in the full flow of inspiration.

Odes have been classified according to their subjects. The religious ode, or the hymn, in its proper meaning (see *Hymn*), has for its subjects God and his works. To this class belong several psalms, likewise the song of Moses and Deborah; among the Greek odes, some of Pindar's, the Hymn of Cleanthes, and many choruses in the Greek drama; some odes of Horace, for instance, the *carmen seculare*, though it has more polish than elevation; the hymns of Rousseau, Gray, Akenside, Thomson, Cowley and Prior, Klopstock, Herder, and others among the moderns. The dithyrambic (q. v.) has the full flow of sensual feeling for its subject. The heroic ode celebrates heroes or sons of gods, princes, victory, greatness of mind, &c. Most of Pindar's odes are of this sort, as are also some of Dryden's, Pope's, Gleim's, Schiller's, Goethe's. Of the didactic ode, the (so called) *philosophical* and *satirical* are subdivisions. The name of *didactic* is given to the ode as far as it deals with great, instructive and inspiring truths. If it utters noble feelings without immediate reference to the present time, it is called *philosophical*; if it censures the times, as Horace does, it is termed *satirical*. Further, the ode may celebrate certain particular subjects; and here it loses itself in the unlimited field of occasional poems.

No species of poetry has been so much abused as the ode, as it has been made the common form for the praise of persons and things; and this, says Bouterweck, is probably the reason, why the literature of all nations is so poor in odes deserving this name. Most of the Italian odes are very bombastic. Chiabrera is one of the most distinguished Italian writers of odes. The Spanish have Garcilaso de la Vega, Quevedo, Gongora, &c.; but the Spanish ode is very similar to the Italian. The British mostly adopt a strong didactic tone in their odes. The French are exceedingly declamatory; their pointed language is not suited for the ode. Rousseau, L. Racine, Gresset, Chenier, and Lebrun are some of their finest writers in this department. The Germans sometimes lose themselves in unintelligible mysticism, sometimes run into mere relation, not poetical expression of feelings. Some of their odes, however, are truly grand; for instance, Schubart's dithyrambic on Frederic the Great. Some odes of Flemming, Haller, Hagedorn, Uz, Lavater, Ramler, Voss, Kosegarten, Herder, Schiller, are among the first in the language.

ODENWALD; a forest and chain of mountains in Western Germany, between the Neckar and the Maine, in the grand-duchies of Hesse-Darmstadt and Baden. The Neckar divides the Odenwald from the Black Forest. The Odenwald is about twenty leagues long, and presents charming scenes.

ODEON (ᾠδεῖον, from ᾠδὴ, a song); among the Greeks, and, at a later period, among the Romans, a public building devoted to poetical and musical contests. The first odeon was built at Athens by Pericles, and was afterwards used for popular meetings and the holding of courts. At a later period, two others were erected by Pausanias and Herodes Atticus, and other Greek cities followed their example. The first odeon was built at Rome in the time of the emperors. Domitian erected one, and Trajan another. The Romans likewise constructed them in the provincial cities, and the ruins of one are still seen at Catanea in Sicily. The odeons resembled other theatres, except that they were inferior in extent, and were covered with a roof. This name has been given to one of the theatres in Paris, rebuilt, after having been destroyed by fire, in 1818.

ODER (*Viadrus*,) a river of Germany, which rises in Moravia, in a branch of the Sudetic mountains, flows through Silesia, becomes navigable for small boats at Ratibor, passes by Breslau, where it becomes navigable for barges of forty to fifty tons, enters Brandenburg and Pomerania, and empties into the Baltic. Its whole course is about 500 miles: it receives several navigable streams, and communicates with the Elbe by several canals, and is of very great importance for the trade of the country. The principal places on the Oder are Breslau, Frankfort, and Stettin. In the upper part of its course it is rapid, but in the flat country it is subject to frequent inundations. Before reaching the sea, it forms the large maritime lake called the *Stettin Haff*, and divides into three branches—the Peene, Swine, and Divenow. Since 1818 the Prussian government has constructed works for the improvement of the harbour of Swinemunde, the port of Stettin.

ODESSA; a Russian seaport in the government of Cherson, situated on the Black sea, between the mouth of the Dnieper and Dniester, on the bay of Adsehai; lat. 46° 29′ N.; lon. 30° 37′ E. This place, which is now of considerable size (40,000 inhabitants,) and is rapidly increasing, is of modern origin. After the cession of Bessarabia, by the peace of Jassy, in 1792, Catharine fixed on this spot, then containing only a few houses, as a commercial emporium. It has a sufficient depth of water for the largest ships of war. Alexander carried into execution the designs of Catharine, and appointed Richelieu (q. v.,) who was then a French emigrant, and has since been prime minister, governor of the city. It is built in the form of an oblong square, and fortified in the modern style. The port, which is artificial, is capable of receiving 300 vessels. The roadstead is extensive, and the anchorage is safe in summer, being sheltered from every wind except the south-east. The streets are straight, wide, and cross each other at right angles; there are some fine walks, and numerous public buildings. Water was scarce, but has been supplied by aqueducts. There are many institutions for education here. The commerce of Odessa has become extensive. In 1826, 578 ships entered the port. The chief articles of export are grain, timber, hides, furs, flax, linen, wax, tar, potash, caviar, &c. About one-third of the commerce is in the hands of the British. Greeks, Italians, French, Poles, Armenians, and Germans, are among the inhabitants. Government has endeavoured to induce settlers from Germany to occupy the lands in the neighbourhood of Odessa, by granting them certain privileges. Bulgarian and Russian peasants are also numerous.

ODIN. See *Northern Mythology*.

ODOUR. See *Smell*.

ODYSSEUS. See *Ulysses*.

ODYSSEY. See *Homer*.

OE; an affix to many Danish geographical names, signifying *island*.

ŒCOLAMPADIUS, John, was born of a Swiss family at Weinsberg, in Suabia, in 1482, and, according to the custom of that time, adopted the name by which he is generally known, as the Greek of his proper name, *Hausschein* (House-light.) In the twelfth year of his age he entered the university of Heidelberg, whence his father sent him to Bologna to study law. He soon after returned to Heidelberg, applied himself to theology, and became the incumbent of a benefice which had been instituted by his ancestors. Sensible of the limited nature of his acquirements, he went to Tubingen and afterwards to

Stuttgard, where Reuchlin was professor, and there studied Greek, and subsequently Hebrew. His progress was such that he compiled a Greek Grammar. He then returned to Weinsberg, and distinguished himself by his zeal as a preacher. By his friend Capito's influence, he was invited to Basle in 1515, and there became acquainted with Erasmus, and, in conjunction with him, wrote a commentary on the New Testament. In 1516 he received a call at Augsburg, but soon after determined to enter the monastery of Altomunster in the neighbourhood. Luther's writings, however, awakened him to more liberal views, and before he had been two years in the monastery, he left it, and became preacher at the castle of Ebernburg, to Francis of Sickingen. In 1523 he became professor of theology and curate at Basle. He defended the doctrines of the reformation in several theological disputations and conferences, particularly in Basle and Berne, and introduced them into the former place (1527 and 1528.) His conduct in the controversy concerning the Lord's Supper was worthy of all praise. In his treatise *De genuina Verborum Domini, "Hoc est Corpus meum," Interpretatione*, he displayed a rare moderation, maintaining the body to be only symbolical. The defenders of the real presence attacked him with great violence, and applied to him and his followers the reproachful epithet of Sacramentarians. Œcolampadius answered with calmness and dignity. He died at Basle in 1531. His Life has been written by Hess (Zürich, 1793.)

ŒCUMENICAL COUNCIL. See *Council*.

ŒDIPUS; son of the Thracian king Laius and Jocasta. (See *Jocasta*.) An oracle had announced to Laius that his child by Jocasta should be his murderer. When, therefore, a son was born to him, he ordered a slave to bore his heels and expose him on mount Cithæron. But the slave gave the child to a shepherd of the Corinthian king Polybus, and the shepherd carried him to the king, whose wife, Merope, being without children, received him, and called him *Œdipus*, from his swollen feet. Ignorant of his birth, the child grew up at the Corinthian court, with all the qualities of a hero. But, an angry youth having one day reproached him with not being the son of the king, he became a prey to tormenting doubts. His foster parents, whom he questioned, referred him to the Delphian oracle, which gave him this answer—"Avoid the soil of thy country, or thou wilt be the murderer of thy father, and the husband of thy mother." As he looked upon Corinth as his country, he left it, and travelled to Thebes, in Bœotia. In a narrow road in Phocis he met king Laius, who was going to Delphi to consult the oracle with regard to the son whom he had exposed; and the king's charioteer haughtily ordered him to get out of the way. Œdipus refused to obey; a struggle ensued, and both king and charioteer fell under his sword. Thus he had unconsciously fulfilled one half of the oracle. Ignorant of this, he pursued his way. The territory of Thebes was at that time desolated by the Sphinx (see *Sphinx*), which proposed a riddle, and put to death every one who attempted, without success, to solve it. No one had yet succeeded. In this extremity the vacant throne and the hand of the queen were offered to the deliverer of Thebes. Œdipus comes forward, solves the enigma, delivers the city, and receives the prize. The oracle was thus fulfilled. Thebes now honoured within her walls the murderer of Laius, when a pestilence fell upon the land, from which the oracle promised deliverance, as soon as he was removed who had called down this curse. The affrighted people again have recourse to their former benefactor, and he, unconscious that he is himself the criminal, strives with restless zeal to discover him. He draws from the prophet Tiresias the unhappy secret, and makes the horrible discovery that he is the murderer of his father, and the husband of his mother. Cursing the bed in which she had borne a husband to her husband, and a son to her son, the unhappy Jocasta hanged herself. Œdipus put out his own eyes to extinguish the sight of all which could remind him of his guilt. He begged the Thebans to banish him. At a later period, when he wished to die in Thebes, he was driven away by his ambitious sons Eteocles and Polynices. In his anger, he cursed them, and threatened that the sword should divide their inheritance. His two daughters, Antigone and Ismene, followed their blind and exiled father. Led by the former, he reaches the village of Colonos, in Attica, where Theseus reigned, and dwells in the grove of the Eumenides, which no mortal foot dared approach. He conciliates the favour of the terrible goddesses. The people and Theseus took him under their protection. In the meanwhile the oracle of Pythian Apollo had declared that the land which should ignorantly conceal his ashes would be fortunate and invincible. The inhabitants of Thebes now endeavoured to draw him back. Impelled by the presentiment of approaching death, he sought his grave accompanied by Theseus alone. The gods were reconciled to him. His death was the death of suffering innocence. The ancients have disagreed with regard to his burial-place. The history of Œdipus has furnished a subject to several tragic poets. The Œdipus of Æschylus and that of Euripides are lost. Of Sophocles two pieces treating of his fate remain—King Œdipus and Œdipus at Colonos. Seneca has also written a piece on the same subject.

ŒLS, a mediatized principality in Lower Silesia, belonging to the Prussian government of Breslau, contains 800 square miles and 91,000 inhabitants, and affords 175,000 florins annual revenue. The capital is Œls, where the ducal officers of government, &c., reside. In 1789, the duchy passed to the house of Brunswick, and was under the government of duke Frederic William, who fell, in 1815, at Quatre Bras. Hence his title, *duke of Brunswick-Œls*.

ŒNEUS. See *Calydon*.

ŒNOMAUS. See *Hippodamia*.

ŒSTRUS, or Gadfly; an insect, well known from its being one of the greatest annoyances to which horses and cattle are subject during the summer. Under the name of *gadfly* many insects are included by the ignorant which belong to other genera, the real gadflies being the *œstrus* of naturalists, which are supposed to be the same animals as were called by the Greeks *οἶστρος*. Horses, cows, sheep, deer, hares, &c., have each a species of gadfly which bears their name; as, for example, the *Œ. equi* is common upon horses, *Œ. bovis* and *Œ. ovis* upon horned cattle and upon sheep. The gadfly of the horse is a small insect, with whitish wings, with a band and black spot; the abdomen entirely ferruginous. *Œ. bovis* is about seven lines in length; thorax yellow, with a black band; abdomen white; terminal segments fulvous; wings dusky. This species attacks the horse also, the female depositing her eggs in the skin of these animals in considerable numbers. In a short time, the eggs are matured, and produce a *larva*, or worm, which immediately pierces the skin, and, insinuating itself under it, causes much injury and annoyance to the animal, raising large lumps, or tumours, filled with pus, upon which the larva feeds. *Œ. equi* deposits its eggs upon such parts of the skin of horses as are subject to be much licked by the animal, and thus they are conveyed to the stomach, where the heat speedily hatches the larvæ, too well known under the name of *botts*. Horses are sometimes so afflicted by these pests as to die in consequence. The perfect insect is seldom observed, as it lives but a very short time after arriving at the winged state. Taking no nourishment, it seeks but to deposit its eggs in a proper situation, and having accomplished this object, it immediately dies. The animals which are the subjects of its attacks are instinctively aware of its intentions, and exhibit much restlessness and alarm when they discover it. *Œ. ovis* deposits its eggs in the nostrils of sheep, where the larva is hatched, and immediately ascends into the frontal sinuses, attaching itself very firmly to the lining membrane by means of two strong hooks situated at its mouth. All the insects of the genus *œstrus* are thus distinguished by naturalists: haustellum, or trunk, concealed between two tumid lips, which are merely separated by a small orifice; palpi, none; antennæ short and setaceous. The oviduct, through which the eggs are extruded, consists of a membranaceous, cylindrical tube, furnished with three short, reflected, membranaceous bristles. The pupa is hard, and of an oval form, burrowing in the earth and under stones, where it experiences its final transformation into a winged insect. It has been observed that the larvæ of cutaneous *œstri* have the mouth furnished with simple papillæ, while those which infest the stomach and frontal sinuses are provided with strong oral hooks, by which they attach themselves very firmly to the membranes. During the months of June and July, the pupæ are transformed into the perfect insect. M. Humboldt states that, in South America, he observed some Indians whose abdomens were covered with small protuberances, which appeared to have been formed by the larvæ of a species of gadfly. It is also stated that a species exists which, in the larva state, inhabits the frontal sinuses of men. In Arabia, and in some parts of India where camels abound, there is also found a gadfly peculiar to them. An admirable monograph of these insects, illustrated by figures, and observations on their habits and economy, and veterinary observations, has been published in the Linnæan Transactions by Mr Bracy Clark, and since republished, with additions, in a separate volume.

ŒTA; a celebrated mountain in ancient Greece, between Thessaly and Macedonia; or, more accurately, a chain of mountains extending to the west from the gulf of Malia to Pindus, and thence to the bay of Ambracia. See *Hercules*, and *Thermopylæ*.

OFEN. See *Buda*.

OFFERINGS are gifts, which man brings to the Deity, in order to represent the giving up of himself to him. This was the first mode of openly recognising the Divine Being, and a principal part of the service of the Deity in all the religions of antiquity; and, even to this day, the inhabitant of the East makes offerings to God as he makes presents to his temporal lords. The idea that God has physical wants, and finds pleasure in food, drink, and perfumes, was the origin of such offerings, which took their character from the mode of life of those who presented them. Herdsmen and hunters offered beasts; husbandmen, fruits and bread, selecting the choicest of what they possessed. From similar feelings, Abraham consented to offer up his beloved son, and Agamemnon his daughter Ephigenia; though the fortunate issue of these offerings shows that, even in those early times, the pure idea existed that God did not desire the blood of men, and was appeased by a devout disposition. Still the custom of offering men as victims prevailed, even among those heathen nations who had emerged from their primitive rudeness. The Phœnicians offered children to their idol (Moloch); as did also the German nations, and the ancient Mexicans and Peruvians, to their gods. Afterwards, new motives were added to those of reverence and gratitude; men began to consider misfortunes and sufferings as divine punishments for their sins, and, to propitiate the offended Deity, even the life of man did not appear too valuable. But, while the altars of the heathen world flowed with the blood of innocent children and defenceless captives, Moses made unblemished beasts, and fruits, the symbols of the resignation and penitence of his people, before Jehovah. Offerings constituted the principal part of the Israelitish worship. These were either bloody, when the offering was bullocks, goats, and sheep, or, in case of necessity, doves, slain by the priests, which were wholly or partially burnt (burnt-offerings); or bloodless, when the offering was meal, cake, salt, oil, honey and frankincense, or wine, which was poured out upon the altar (drink-offerings). With regard to their meaning and object, these offerings were either thank-offerings and peace-offerings, which consisted of a bullock, or some small animal, and were usually accompanied with offerings of vegetable food; or trespass and sin-offerings, in which only animals were used. In the last-mentioned cases, the priests were accustomed to sprinkle the parties who made the offerings with the blood of the victims, as a sign of reconciliation with Jehovah; and where the offering was an expression of the penitence and expiation of the whole people, it was usual to burn the victim; but if it concerned only private persons, the priests used to eat the flesh. The offerings of beasts, and the first fruits (which were required to be offered on certain festivals, and in case of important occurrences in families, or for the expiation of individuals), belonged to the priests, who burned only the part that could not be eaten. The heathen priests enjoyed the same advantage; and although, among both Jews and heathen, the priests alone were allowed to offer the sacrifices, they permitted the givers to take a part in the feasts for which their offerings were used, from the time of the hecatombs of the Greeks, before Troy, down to that of the sacrifice banquets, which Theodosius, as is well known, abolished in A. D. 392, together with all the heathen worship in the Roman empire. The hecatombs of the Greeks and Romans were burnt-offerings; their libations, drink-offerings. The truth, confessed by the prophets of the Old Testament, that man cannot offer any thing to God which is not already his, Christianity acknowledged by the abolition of the heathen and Jewish offerings, and required of its professors only the moral offering of a renunciation of evil, the devotion of their powers and property to the welfare of mankind, and the perfect resignation of the heart to God. Consecrated gifts, however, were applied to the support of public worship and the clergy. Of this kind were the oblations of the first Christians. When the payment of tithes to the clergy was introduced, these offerings were withheld, and most generally commuted for money. With the oblations are connected the *offertoria*, which, according to a usage still existing among many religious sects, were laid, at an appointed time, for the priests, upon the altar. These *offertoria*, however, had nothing to do with the religious services. The mass is a conspicuous part of the worship in the Catholic church, and, even to this time, is called the *bloodless offering;* since, according to the doctrine of this church, the priest who officiates at the mass, offers anew, as it were, by the consecration of bread and wine, the body and blood of Christ, in the place of the Jewish sin-offering. The custom of making religious offerings exists among pagans also, in our time. The Chinese consecrates fruits to his divinities; the Carib, tobacco; the Negro, in the West Indies, brandy; and, among the savage inhabitants of some islands, there are still found traces of human sacrifices.

OFFERTORIUM, or OFFERTORY, is the anthem which is sung, or the music executed, while the people are making their offerings. It is one of the chief parts of the mass. See *Mass and Offering*.

OFFICERS, FIELD, are such as command a whole regiment; as the colonel, lieutenant-colonel, and major.

OFFICERS, GENERAL, are those whose command extends to a body of forces, composed of several regiments: such are generals, lieutenant-generals, major-generals, and brigadiers.

OFFICERS, STAFF, at the English court, are such as, in the king's presence, bear a white staff or wand, and at other times, on their going abroad, have it carried before them by a footman, bare-headed: such are the lord-steward, lord-chamberlain, lord-treasurer, &c.

OFFICIAL, by the ancient law, signifies him who is the minister of, or attendant upon, a magistrate. In the canon law, it is especially taken for him to whom any bishop generally commits the charge of his spiritual jurisdiction.

OFFING, or OFFIN; that part of the sea a good distance from shore, where there is deep water, and no need of a pilot to conduct the ship.

OFFSETS, in gardening; those young shoots that spring from the roots of trees or plants, which, being carefully separated and planted in a proper soil, serve to propagate the species.

OFTERDINGEN, HENRY OF, or AFFTERDINGEN, EFFTERDINGEN; one of the most celebrated German poets of the twelfth and thirteenth centuries (the Suabian period,) of the circumstances of whose life little is known. His youth is said to have been passed in Austria, at the court of Leopold VII. Here he cultivated his poetical powers, and hence made journeys to different parts of the country. (See *Minnesingers*, and *German Poetry*.) At the court of Herman, landgrave of Thuringia, he sustained a poetical contest with Wolfram of Eschenbach (q. v.), and sang the praises of his emperor. Of his poetry we have nothing remaining except some passages of the War on the Wartburg, in the Manesse collection, and a part of the *Heldenbuch*. It is disputed whether he is the author of the *Nibelungenlied* (q. v.) or not. Novalis has given his name to one of his romances.

OG, king of Bashan, mentioned in the Bible, was, according to the accounts of the Rabbins, one of the giants who lived before the flood, and escaped the general inundation by taking refuge on the roof of Noah's ark. Noah fed him there, less through compassion, than that he might be to men of after times a proof of the power of God, who had created and destroyed from the face of the earth such monstrous creatures. In the war of Og against the Israelites, he lifted up a mountain 6000 paces in circuit, and was about to throw it down upon the camp of Israel, when it was pierced through by ants sent by God, and fell upon him. At the same moment his teeth grew so quickly, that they entered the mountain, and held him fast, so that Moses could kill him without difficulty. To give an idea of his gigantic size, the Rabbins say that Moses, who, according to their account, was six ells high, and had a battle-axe of the length, was obliged to make a leap of six ells, in order to strike his ankle-bone. He bled to death of the wound.

OGDENSBURGH. See *Oswegatchie*.

OGECHEE LIME. See *Tupelo*.

OGEE ARCH. See *Architecture*.

OGINSKI; the name of an illustrious Polish house. *Michael Casimir Oginski*, commander in Lithuania, fought against the Russians; but the fate of his unhappy country obliged him to flee. He lost two-thirds of an immense fortune. He constructed the canal which bears his name, and unites the Baltic and the Black sea, entirely at his own expense. He died, seventy-two years old, in Warsaw, in 1803.

Michael Cleophas, nephew of the former, born in 1765, was foreign minister at the Hague, and fought on the side of Kosciusko, in 1794. At a later period he acted as the agent of the patriots in Paris and Constantinople. Alexander permitted him, in 1802, to return. In 1810 he was appointed senator and privy counsellor; but, in 1815, he went to Italy, and devoted himself to music. His compositions, particularly his *Polonaises*, are celebrated. His *Mémoires sur la Pologne et les Polonais depuis* 1788—1815 (Paris, 1826, 2 vols.) are important for the period from 1794 to 1798.

OGLETHORPE, JAMES EDWARD; an English general officer, born in London in 1698, and educated at Oxford. He served under prince Eugene. In 1733 he distinguished himself by his exertions to found the colony of Georgia, for which he obtained the royal charter. He also conducted a body of emigrants to the province, at which time he was accompanied by the two Wesleys. In 1734 he returned, with an Indian boy in his suite, and, in 1736, revisited Georgia with another band of emigrants, and proceeded very successfully in the settlement of the colony. As commander of the British forces in Georgia and Carolina, he repelled the attempts of the Spaniards. In 1745 he was made major-general, and was employed to follow the rebels under the Pretender. The private character of general Oglethorpe was extremely amiable, and he has been eulogized by Thomson, Pope, and doctor Johnson.

OGYGES is mentioned as the most ancient ruler of Attica, then called *Acta*, about 1700 B. C. The Athenians call him a native of the country. According to other accounts he was king of the Hectenes, the original inhabitants of the country, first called *Ogygia*, and afterwards *Bœotia*, from the Bœotians. Even the building of Thebes is ascribed to him, and one of the gates of the city was named after him. The gate, however, is also said to have been so called from Ogygia, a daughter of Amphion and of Niobe. Under the reign of Ogyges happened the Ogygian deluge, which laid waste all Attica, according to Larcher, 1759 B. C. A later opinion is, that a colony of priests under an Egyptian king, Ogyges, came to Bœotia, and thence spread over Attica. The island of Calypso was also called *Ogygia*. See *Calypso*.

OHIO, one of the United States of America, is bounded north by Michigan Territory and lake Erie, which separates it from Upper Canada, east by Pennsylvania and the Ohio river, south by the Ohio river, which separates it from Virginia and Kentucky, and west by Indiana. The Ohio river, in its various windings, bounds this state 436 miles. Ohio is situated between 38° 30′, and 42° of north latitude, and between 80° 28′, and 84° 42′ of west longitude. It is about 222 miles in extent, both from east to west, and from north to south; but lake Erie projects so far into the northern borders, and the Ohio river cuts off so much of its southern quarter, that the area of the state is little more than 200 miles square. The state is divided by nature into four grand divisions, which are named after the principal waters on which they are situated. They are the Miami country, the Scioto country, the Muskingum country, and the Lake country. For civil purposes, Ohio is divided into seventy-three counties. In the greater part of the state, the towns or villages are not situated in townships of the same name; but the New England custom of nearly identifying *town* and *township* prevails in some parts of Ohio, which were settled principally from New England. In many cases, also, the post-offices in Ohio bear different names from the towns in which they are situated. The largest city of Ohio is Cincinnati, in the south-west corner of the state. Its population, in 1830, was 24,431, according to the official census. Another census of the same year made it 26,515, and, in 1831, it contained 28,014. Columbus, the seat of government, contained 2437 in 1830. Zanesville, Dayton, Steubenville, and Chilicothe, are larger than Columbus. The population of Ohio has increased, and increases, with wonderful rapidity. In 1790 it contained only 3000 inhabitants; in 1800, 45,365; in 1810, 230,760; in 1820, 581,434; in 1830, 937,637. There are remnants of several Indian tribes in Ohio, amounting, in 1829, to 2350 persons. They then owned 390,846 acres of land, besides 16,200 acres which were secured to individuals of the several tribes. These lands are secured by treaty to the Wyandots, Shawnees, Senecas, Delawares, and Ottawas; for the other remnants of tribes are classed with these. The Delawares have sold their share, amounting to 5760 acres. Considerable annuities are paid by the national government to these tribes. Their population gradually diminishes. There are very few negroes in Ohio, and none are held as slaves.

The Presbyterians in this state have 346 churches, and 22,150 communicants; the Baptists have 240 churches, and 8801 communicants; the Methodists have 36,064 members; the Lutherans have 8706 communicants; the Associate Presbyterians have sixty-five congregations, and 4225 communicants; the German Reformed have eighty-two congregations, and 3750 communicants; the Episcopalians have sixteen ministers; the New Jerusalem church have four societies: there are also a considerable number of Friends and Roman Catholics, and some Universalists, Unitarians, and Shakers. There are five colleges in operation in Ohio, viz. the university of Ohio, at Athens; Miami university, at Oxford; Western Reserve, at Hudson; Kenyon, at Gambier, and Franklin, at New Athens. There are no incorporated academies that are flourishing. Great attention is paid to common schools. An act passed by the legislature in 1831 provides that a fund shall be raised in the several counties in the state, for the use of common schools, for the instruction of the white youth of every class, without distinction, in reading, writing, and arithmetic, and other necessary branches of education. An asylum for the deaf and dumb has been established at Columbus, under the auspices of the state.—The principal domestic articles of trade are horses, cattle, swine, whiskey, and flour. Those articles which are exported from the northern and some interior counties are frequently sent to the Montreal and New York markets, by way of lake Erie. From the southern parts of the state, they are sent to New Orleans. The new canal from lake Erie to the Ohio river will have a tendency to divert the trade from New Orleans to New York. (For a description of the canals of Ohio, see the article *Canals*.) Lake Erie bounds Ohio on the north 160 miles. Its whole length is 270 miles, and its average breadth from forty to fifty. Its circumference is 600 miles, and its area is 11,000 square miles. It affords good navigation for steam-boats and schooners. The principal rivers are the Maumee, Portage, Sandusky, Huron, Vermilion, Black, Rocky, Cuyahoga, Grand, and Ashtabula, in the north; and the Mahoning, Muskingum, Hockhocking, Scioto, Little Miami, and Great Miami, in the south. The Ohio river, and its steam-boat navigation, will receive a separate description.

The interior and northern parts of Ohio are generally level, and, in some places, marshy. About one quarter of the eastern and south-eastern part, bordering on the Ohio river, is very hilly and broken. The hills are not, however, very large. Immediately on the borders of the Ohio there are numerous tracts of interval or meadow land of exuberant fertility. In the interior parts, bordering on both sides of the Scioto, and on the two Miamis, are the most extensive bodies of rich and level land. In many places are extensive prairies, particularly on the head waters of the Muskingum and Scioto, and between the two Miamis. Several of these are low and marshy, and others are elevated. The high prairies are not fertile. Among the forest trees are black-walnut, oak of various species, hickory, maple of different kinds, beech, birch, poplar, sycamore, ash of several species, pawpaw, buckeye, cherry, and many which are less common. The soil and climate are admirably suited to the most valuable vegetable productions that grow in this latitude. Wheat, maize, rye, and all other kinds of grain, grow here in great perfection. Scarcely any part of the United States is so productive, or affords so many of the natural means for an easy and comfortable subsistence. The summers are warm, and pretty regular, although somewhat subject to tornadoes. In some parts, near marshes and stagnant waters, fevers and agues frequently prevail; but the climate, in general, is decidedly healthy. The general temperature, in that part of the state which slopes to the south, is several degrees warmer than in the same latitude in the Atlantic states. In the Miami country, especially about Cincinnati, green peas, and many other vegetables, are generally abundant in the markets between the first and twentieth of May. Snow seldom falls deep enough for sleighing, or lasts more than two or three days, in the southern half of the state; but there are generally two or three days of extremely cold weather. In the counties bordering on lake Erie, and for fifty miles back, there are often several weeks of good sleighing. The winds of Ohio, whether high or low, generally blow from the west and south-west at all seasons. About one fifth part of all the land in Ohio still belongs to the United States. Settlers on this land will become citizens of Ohio; but the purchase-money belongs to the general government. In the north-east part of the state is a tract containing 3,300,000 acres, called New Connecticut, or Connecticut Western Reserve. The fee of these lands is in the state of Connecticut, but Ohio has the jurisdiction. This tract is divided into eight counties, and is principally settled by emigrants from Massachusetts and Connecticut. The state of Virginia also owns a tract of 4,204,800 acres, called the Virginia Military Lands, and situated between the Scioto and Little Miami rivers. This district is not surveyed into townships, or in any regular form; and there are frequently many claimants to the same lot, whose rights are not easily defined. Eight counties are situated wholly within this district, and a part of fourteen others.

The first permanent settlement in the state of Ohio was made at Marietta, April 7, 1788, by forty-seven persons from Massachusetts, Rhode Island, and Connecticut. The next year, a settlement was made at Columbia, six miles above Cincinnati, by a company principally from Pennsylvania. In 1791, several French emigrants settled at Gallipolis. In September, 1799, the first territorial legislature assembled at Cincinnati, under the ordinance of congress of July 13, 1786, for the government of the territory of the United States north-west of the river Ohio. April 30, 1802, congress passed an act authorizing the calling of a convention to form a state constitution for that part of the North-West Territory which now constitutes the state of Ohio. On the first of November following, the convention met at Chilicothe, and formed the present constitution (for which see *Constitutions of the United States*). In several parts of Ohio are found remarkable antiquities in the shape of mounds, or *tumuli;* and also remains of ancient forts. For a description of these, see the article *Tumuli.*

OHIO, a river of the Mississippi Valley, is formed by the confluence of the Alleghany and the Monongahela at Pittsburg, in the western part of Pennsylvania. It flows with a gentle current, generally in a south-western direction, but with a very serpentine course, and unites with the Mississippi in latitude 37° N., and longitude 88° 52′ W. Its length from Pittsburg to its mouth, is about 900 miles, including its windings; but the direct distance is only 614 miles. Its breadth varies from 400 to 1400 yards. At Cincinnati, it is about 800 yards, which is nearly its average breadth. It is very well suited to boat navigation, although its numerous windings render a passage upon it rather tedious. The current of the Ohio is remarkably gentle, and is broken by falls or rapids only at Louisville, in Kentucky. At this place, the water runs with great rapidity for several miles; yet the current is not so broken as entirely to prevent the ascent of boats. The whole perpendicular descent in two miles is twenty-two and a half feet. The canal around these rapids (for an account of which see *Louisville*) greatly facilitates the navigation of this river. Letart's rapids, twenty-five miles below Shade river, form a slight obstruction in some stages of the water. Numerous islands, large and fertile, are embosomed in the Ohio. Its annual range, from low to high water, is about fifty feet: the extreme range is about sixty feet. When lowest, it may be forded at several places above Louisville. It is generally lowest in August, September, and October, and highest in December, March, May, and June. Near Pittsburg, it is frequently frozen over for several weeks during winter; and this has been the case more than 400 miles lower. Generally, the navigation upward is suspended by floating ice during eight or ten weeks of each winter. Its current, when the river is at its mean height, is about three miles an hour; when higher and rising, it is more; when very low, it does not exceed two miles an hour. The numerous islands form no serious obstruction to its navigation, except at low water, when the bars and ripples connected with them are somewhat dangerous. Steam-boats have been found to be peculiarly well adapted for its navigation. The whole number of steam-boats built on the western waters is 348; the number running in 1831 is 198. Of these, sixty-eight were built at Cincinnati, sixty-eight at Pittsburg, twelve at New Albany, and nearly all the others in Ohio and Kentucky. A great part of these boats are employed in the commerce of the states bordering on the Ohio; but they also connect with it the commerce of the states on the Mississippi. The tract of country through which the Ohio flows is one of the richest and most delightful on the globe. The wealth of the neighbouring states is easily transported to this channel by the numerous navigable rivers which it receives, and is thence conveyed to New Orleans—the grand commercial emporium of the Mississippi Valley.

OIL. The general characters of this substance are inflammability and insolubility in water. Oils are distinguished into two classes, fixed or fat oils (see *Fat*), and volatile or essential oils. (See *Essential Oils.*) The former class do not rise in distillation at the heat of boiling water, while the latter rise into vapour at all degrees of temperature. When exposed to the action of the air, the oils by degrees lose their liquidity, thicken, and occasionally become hard. Such as become indurated so as not to stain paper when applied to it, take the name of *drying* oils; such as linseed oil, poppy-seed oil, nut oil, &c. Such as do not harden in this way are called *unctuous* oils; as olive oil, almond oil, rape-seed oil, &c. In this change no water is formed; some carbonic acid is evolved, but not nearly equivalent to the oxygen absorbed. The recent fixed oils exercise on oxygen hardly any action for a long time; but they suddenly suffer a change of state, which enables them to absorb at least 100 times more of it than volatile oils would do in the same time. A layer of nut oil, three lines thick and two inches in diameter, laid on mercury in the shade, in pure oxygen gas, absorbed only a volume equal to thrice its own, during eight months, namely, between December and August; but, during the ten following days, it absorbed sixty times its volume. This absorption continued to proceed with more slowness till the end of October, when the further diminution of the gas became insensible. By this time the oil had absorbed 145 times its bulk of oxygen, and had formed twenty-one volumes of carbonic acid gas. No water was produced, but the oil had become a mass of transparent jelly, which did not stain paper. This sudden change, at a certain crisis, in the state of the drying oils, explains the *spontaneous inflammations* which they are known to produce, and of which the volatile oils afford no examples.

OILEUS; one of the Argonauts. See *Ajax.*

OIL GAS. It had long been known that wax, oil, tallow, &c., when passed through ignited tubes, are resolved into combustible gases, which burn with a rich light. Messrs Taylor and Martineau were the first to avail themselves of this fact, in the construction of apparatus for generating oil gas on a large scale, as a substitute for candles, lamps, and coal gas. The advantages of oil gas, when compared with coal gas, are claimed by these gentlemen to be the following: The material from which it is produced containing no sulphur or other matter by which the gas is contaminated, there are no objections to its use on account of the suffocating smell in close rooms. It does no injury to furniture, books, plate, pictures, paint, &c. All the costly and offensive operation of purifying the gas by lime, &c., are avoided; nor does the metal of which the conveyance pipes are made receive the slightest injury from oil gas. The economy of light from oil gas is thus stated:—

Argand burner, oil gas, . .	1d.	per	hour.
Argand lamps, spermaceti oil,	3d.	—	—
Mould candles, ...	3½d.	—	—
Wax candles.	14d.	—	—

The oil gas has a material advantage over coal gas from its peculiar richness in olefiant gas, which renders so small a volume necessary, that one cubit foot of oil gas will be found to go as far as four of coal gas. This circumstance is of great importance, as it reduces in the same proportion the size of the gasometers which are necessary to contain it. This is not only a great saving of expense, but is a material convenience where room is limited. The iron retorts employed, after a slight using, cease to afford the gas, from an alteration produced on the iron by the action of oil at a high temperature, and require the introduction of fragments of brick, mingled with the oil, which produce a great increase of the decomposing power. A general idea of the process may be formed from the following account:—A quantity of oil is placed in an air-tight vessel, in such a manner that it may flow into retorts, which are kept at a moderate red heat, and in such proportions as may regulate the production of gas to a convenient rate; and provision is made that this rate may be easily governed at the will of the operator. The oil, in its passage through the retorts, is principally decomposed, and converted into gas proper for illumination, having the great advantages of being pure from sulphureous contamination, and of supporting a very brilliant flame with a very small expenditure. As a further precaution, to purify the gas from oil which may be suspended in it in the state of vapour, it is conveyed into a wash vessel, where, by bubbling through water, it is further cooled, and rendered fit for use. It then passes, by a proper pipe, into a gasometer, from which it is suffered to branch off in pipes in the usual manner.

OIL OF VITRIOL. See *Sulphuric Acid.*

OIL-PAINTING. The art of painting with oil-colours, which to this day are the kind most commonly used for large pictures, has, on account of its liveliness, strength, agreeableness, and natural appearance, on account of the variety and mixture of tints,—in short, on account of the charm of the colouring,—pre-eminence above other kinds of painting. The colours are somewhat darker, but also more brilliant than water-colours. Painters in oil-colours have succeeded in imitating the enamel with which nature adorns her productions, the softness and mellowness which give the greatest charms to landscape, the transparency of the shades, and the blending of the colours. Oil-paintings are also but little injured by exposure to water and other moisture, for the oil-colour is not easily destroyed when it is once dried, and a spot can be painted over as often as the artist pleases. The frequent retouching which this kind of painting allows, enables the artist to produce the finest harmony, and the highest effect of colours, with more ease than is possible with water-colours, which must be left to stand as they were first laid on. Oil-colours can also be laid on over each other, so that the under one appears through—an important advantage, which water-colours have not. Besides, as oil-colour is tenacious, and the neighbouring tints do not run into each other, the painter can obtain both a better mixture and a more suitable juxtaposition of colours than in water-colours. On the other hand, oil-paintings have the disadvantage of dazzling by the glittering of the light falling upon them: for this reason, an oil-painting cannot be seen equally well from all points of view; and the dust adheres to it more closely, which evil will be often prevented by a coat of varnish. In the course of time the colours gradually become darker; the flesh tints, particularly, take a reddish yellow colour, by which the truth of the picture is very much injured. The fault is in the oil with which the colours are made; for all kinds of oil become yellow in time. Nut oil is most commonly made use of, with which the colours are dissolved and ground, and which is drying in its nature. The linseed oil, as it is grossest and fattest, is used for the groundwork. Oil of poppy is also substituted for nut oil. It is whiter, clearer, and lighter: but, as some colours, when they are ground, dry with much difficulty, various kinds of varnish are used to mix with such colours. A great advantage of oil-painting is that the painter can judge with more certainty of the effect of his work, since the colours do not change in drying, as water-colours do: only, in order to prevent the colours growing too dark, he must, at the beginning, make the tone somewhat strong and brilliant, and preserve the right proportion in the oil. Many, therefore, mix in some oil of spikenard, which makes the colours more liquid, and evaporates rapidly. The brilliancy of the colours often only hurts the effect of the picture.

Oil-paintings are made upon wood, copper, and other metals; also upon walls, thick silk; but now most commonly upon canvass, which is stretched upon a frame, and done over with glue or gold for a ground; by some, also, with white water-colours. When the canvass is prepared, the outlines are drawn with white chalk, and then the colours are laid on. The colours are ground with what is called a *muller*, upon a porphyry stone, until they have the consistency of a thick paste. The pallet is made use of in order to have the prepared colours in a convenient situation for the work, the same being mixed and arranged in a proper series. At first the groundwork is put on, and the sketch must be made with the same tints with which the picture is finished. A person of the name of Picault is called the inventor of the art of removing the colours of oil-paintings from wood, and transferring them to canvass. In later times it has been the custom to shave off the worm-eaten wood very nicely, as far as the under side of the picture, and to transfer the latter to new wood. (See Fiorillo's *History of the Arts of Design.*) Still more common is the art of painting over (or retouching) oil-paintings; and it has arrived at a high degree of perfection. Yet it is almost impossible to prevent the traces of this process from being seen after some time. It is also customary to stretch upon new canvass oiled paintings executed on canvass, when the canvass begins to decay, or become torn, and peel off.

There has been much contention about the origin and the antiquity of oil-painting. The old and general opinion was, that John van Eyck (q. v.), also called *John of Bruges*, invented this art in the fourteenth century. According to a late opinion, oil-painting is much older than the time of John van Eyck, and was carried on in his time in Italy. For this opinion Cennini's treatise on painting is quoted. Cicognara also considers it of Italian origin, and ascribes the improvement of it to the Netherlands, who seem to have the more foundation for their claim to the invention, because the artists there do not paint in fresco generally, on account of their climate. If he is correct, the Netherlands would be entitled only to the credit of having perfected or restored this art, which before was not so advantageously practised, and, on account of numerous difficulties, had declined. Some, indeed, attribute this invention to Antonello of Messina, others to Col. Antonio di Fiore of Naples. Fiorillo, in his History of the Arts of Design, holds to the old opinion. It is certain that oil-painting was interrupted a hundred years before the time of Eyck, and in the fourteenth and fifteenth centuries, until his time, water-colours were universally used. Indeed, they continued in frequent use at least until 1469. John van Eyck was fond of chemistry, and his acquaintance with this science gave him an opportunity of restoring oil-painting. He discovered a varnish with which he covered his pictures in water-colours, and gave them more brilliancy and strength; but this varnish dried with difficulty, and when, for the first time, he put one of his pictures in the sun, it cracked. This induced him to make another varnish out of nut and linseed oil, which proved to be better than the former. He observed that the colours mingled much easier with oil than with glue-water, and that decided him to follow this method. He began with it between 1402 and 1410, and instructed also two of his countrymen in it, namely, Roger of Bruges and Roger van der Weyden. Succeeding painters perfected the art still more.

OISE; a department of France. See *Department.*

OLA, or OOLA; a Mongol word for *mountain*, occurring in many geographical names.

OLAVIDES, DON PABLO, count of Pilo, born at Lima, in Peru, in 1740, went at an early age to Madrid, where his talents and activity soon raised him to important stations. He accompanied count d'Aranda on his embassy to France, in the capacity of secretary. Charles III. created him count, and appointed him intendant of Seville. Olavides formed several great and useful plans of public improvement, particularly one for bringing the Morena into cultivation. Charges of heresy interrupted these projects, and the man who had done so much to promote the splendour and prosperity of his country, was condemned to imprisonment and monastic penances by the inquisition, in 1778. In the third year of his confinement he succeeded, by the aid of his friends, in escaping to Venice, whence he afterwards returned to Spain, and died in 1803. A defence of religion against infidelity—*El Evangelio en Triunfo*, which, in two years, passed through eight editions—is attributed to Olavides.

OLDCASTLE, SIR JOHN, (lord Cobham,) was born in the fourteenth century, in the reign of Edward III. and obtained his peerage by marrying the daughter of lord Cobham. He excited the resentment of the clergy by his zealous adherence to the doctrines of Wickliffe, whose works he collected and transcribed, distributing them among the people. In the reign of Henry IV. he was at the head of an English army in France during the Orleans and Burgundian factions, and he obliged the duke of Orleans to raise the siege of Paris. Under Henry V. he was accused of heresy; but the king, with whom he was a favourite, delayed the prosecutions against him, and tried to reason with him, and to convince him of his alleged errors, but in vain; and he soon after left him to his fate. He was then cited before the archbishop of Canterbury, and not being able to satisfy his accusers, he was condemned as a heretic, and committed to the Tower, whence he escaped into Wales. A report was then zealously circulated by the clergy, and sent to the king, that 20,000 Lollards were assembled at St. Giles's for his destruction, with lord Cobham at their head. This accusation seems to have been fully credited by Henry, though there does not appear to have been really the slightest foundation for it, on which a bill of attainder was passed against lord Cobham; and he was burned alive in St. Giles's-fields in 1417. He was a man of high spirit and warm temper, which his misfortunes could not subdue. His acquirements were extensive, and his thirst after knowledge first made him acquainted with the doctrines of Wickliffe. In conversation, he was remarkable for the poignancy and readiness of his wit. He wrote Twelve Conclusions, addressed to the Parliament of England, published in Bale's Brefe Chronycle concernyng the Examynacyon and Death of the blessed Martyr of Christ, Syr Johan Oldecastle, the Lorde Cobham, which was reprinted in 1729.

OLDENBURG; a duchy of the Germanic confederacy, in the north part of Germany, consisting of three distinct parts—Oldenburg proper and its dependencies, bounded by the North sea and the Hanoverian territories (2332 square miles, 196,100 inhabitants); the principality of Lubeck, surrounded by Holstein and Lauenburg (200 square miles, 21,000 inhabitants); and the principality of Birkenfeld, lying between the Prussian province of the Lower Rhine and the duchy of Saxe-Coburg-Gotha (190 square miles, 23,600 inhabitants). The principal rivers are the Weser, the Trave, the Nahe. The face of the country is in general very low, and is intersected with numerous canals and dikes to drain off the waters and preserve it from inundation. A considerable part of the country is sandy or marshy, and, although agriculture is the principal occupation of the inhabitants, does not yield corn enough to supply their wants. The power of the duke is not limited by the estates, which are convened merely for the imposition of taxes. The revenue amounts to 1,500,000 guilders. The taxes are considered the lowest in Germany. The duke of Oldenburg has, with Anhalt and Schwartzburg, the fifteenth vote in the Germanic diet, and by himself one vote in the *plenum*. His contingent to the federal army is 2178 men. The capital of the duchy is Oldenburg, a well-built city, with a handsome ducal palace lying on the Hunte, which is navigable for small vessels. Population, 5800. The house of Oldenburg is one of the most ancient in Europe. The first count of Oldenburg built the city of that name in 1155, and his descendants have reigned in Denmark. In 1647, the county of Oldenburg, together with that of Delmenhorst, which had been united with it, passed, by the extinction of the reigning branch, to the Danish line. In 1773, the latter ceded Oldenburg, in exchange for Holstein, to the emperor of Russia, who conferred it on his cousin, the bishop of Lubeck. In 1777, Oldenburg, with Delmenhorst, was made a duchy. Considerable additions were made to the Oldenburg territories in 1803, most of which were incorporated with the French empire in 1810 (comprised in the departments, Mouths of the Weser, and Mouths of the Elbe), but restored by the congress of Vienna, with the addition of the principality of Birkenfeld in 1813.—See Von Halem's *History of the Duchy of Oldenburg* (in German); and Kohli's *Description of the Duchy of Oldenburg* (in German, Bremen, 1824); see also, the articles *Europe* and *Germany*.

OLDFIELD, ANN; a celebrated English actress, born at Westminster, in 1683. Her father held a commission in the guards; but, dying while she was young, she was apprenticed to a seamstress. Her talents attracted the notice of Farquhar, the author of the Beaux' Stratagem, who introduced her to Sir John Vanbrugh, through whose means she obtained a theatrical engagement in 1699. She first distinguished herself in the character of Alinda, in the Pilgrim of Beaumont and Fletcher; but it was not till 1703, when she appeared as Leonora, in Sir Courtly Nice, that her merits were properly appreciated; and, having the advantages of a good figure and a fine voice, she soon became a general favourite. Her great excellence lay in comedy, and the parts of lady Betty Modish, in the Careless Husband, and lady Townly, in the Provoked Husband, of Cibber, were those in which she was most admired; but she sometimes also appeared in tragedy, and in such characters as Calista and Cleopatra, her talents were very conspicuous. She was the acknowledged mistress of Mr Arthur Maynwaring for some years previously to his death in 1712; and she afterwards became connected with general Churchill. Her death took place Oct. 23, 1730; and her corpse, after lying in state, was interred in Westminster abbey.

OLD MAN OF THE MOUNTAINS. See *Aloadin*.

OLD STYLE. See *Calendar*.

OLEARIUS, ADAM (properly *Œlschläger*), born about 1600, at Aschersleben, in Halberstadt; after finishing his studies at Leipsic, went to Holstein, and became mathematician and librarian to the duke of Holstein-Gottorp. In 1633, he was attached to a legation to Moscow, and, in 1635, to a second legation to Russia and Persia. After his return in 1639, Olearius published an account of his travels (*Newe* *orientalische Reisebeschreibung*, Sleswic, 1647; often reprinted), with translations of the *Gulistan* of the Persian poet Saadi, and of the fables of Lokman. In 1651, he was received into the Fruit-bearing Society, under the name of *Vielberühmte* (much famed), and died in 1671.

OLEFIANT GAS was discovered at Haarlem, in 1796, by the associated Dutch chemists, and received its present name from its property of giving rise to a substance resembling oil, when mingled with chlorine (*oleum fio*). It is sometimes called *bi-carbureted*, or *per-carbureted hydrogen*, and *hydroguret of carbon*. It is prepared by mixing in a capacious retort six measures of strong alcohol with sixteen of concentrated sulphuric acid, or one measure of common alcohol and three of ordinary oil of vitriol, and heating the mixture over an argand lamp. The acid soon acts upon the alcohol; effervescence ensues, and olefiant gas passes over. At the commencement of the process, the olefiant gas is mixed with a little ether; but in a short time the solution becomes dark, the formation of ether declines, and the odour of sulphurous acid begins to be perceptible; and towards the close of the operation, though olefiant gas is still the chief product, sulphurous acid is freely disengaged, some carbonic acid is formed, and charcoal in large quantities deposited. The olefiant gas is collected over water or mercury. The greater part of the ether condenses spontaneously; and the sulphurous and carbonic acids may be separated by washing the gas with lime-water or potash. The olefiant gas, in this process, is derived solely from the alcohol; and its production is owing to the strong affinity of sulphuric acid for water. Alcohol is composed of carbon, hydrogen, and oxygen; and from the proportion of its elements it is inferred to be a compound of eight parts, or one equivalent of oxygen gas united with one equivalent, or nine parts of water. It is only necessary, therefore, to obtain olefiant gas, to deprive alcohol of the water which is essential to its constitution; and this is effected by sulphuric acid. Olefiant gas is a colourless, elastic fluid, which has no taste, and scarcely any odour when pure. It extinguishes flame, is unable to support the respiration of animals, and is set on fire when a lighted candle is presented to it, burning slowly, with a dense white light. With a proper quantity of oxygen gas, it forms a mixture which may be kindled by flame or the electric spark, and which explodes with great violence. On conducting this experiment with care, it is found that, for each measure of olefiant gas, precisely three of oxygen are required, when the mixture wholly disappears, giving rise to a deposition of water and two measures of carbonic acid. Olefiant gas, by weight, consists of

Carbon, ...	25·418
Hydrogen, ...	42·36

When olefiant gas is mingled with chlorine in the proportion of one measure of the former to two of the latter, they form a mixture which takes fire on the approach of flame, and which burns rapidly, with formation of muriatic acid gas, and deposition of a large quantity of charcoal. But if the gases are allowed to remain at rest after being mixed together, a very different action ensues. The chlorine, instead of decomposing the olifiant gas, enters into direct combination with it, and a yellow liquid, like oil, is generated. This substance is sometimes called *chloric ether*; but the term *hydrocarburet of chlorine*, as indicative of its composition, is more appropriate. To obtain it pure, and in a dry state, it should be well washed with water, and then distilled from chloride of calcium. As thus purified, it is a colourless, volatile liquid, of a peculiar sweetish taste and ethereal odour. Specific gravity, 1·2201. It boils at 152° Fahr., and may be distilled without change. Its composition is

Chlorine. . .	2·5	36 one proportion;
Olefiant gas, . .	0·9722	14 one proportion.
	3·4722	50

From an observation made by professor Silliman, that the chloric ether is readily soluble in alcohol, imparting to it its peculiar sweet taste, and forming with it a grateful diffusive stimulant, Mr Guthrie, of Sackett's Harbour, has been led to attempt the manufacture of this etherized spirit in a more economical way, in which he has fully succeeded. The following is his process:—Into a clean copper still put three pounds of chloride of lime and two gallons of alcohol, of specific gravity ·844, and distil. Watch the process, and when the product ceases to come highly sweet and aromatic, remove and cork it up closely in glass vessels. The remainder of the spirit should be distilled off for a new operation. The quantity of ethereal spirit afforded is one gallon. So far as the effects of this new stimulant have been tried, it is found to be singularly grateful, both to the palate and stomach, producing promptly a lively flow of animal spirits, and leaving, after its operation, little of that depression consequent to the use of ardent spirit. Olefiant gas unites also with iodine, by exposing it to the vapour of iodine in the direct rays of the sun. The *hydrocarburet* of *iodine* thus formed is a solid, white, crystalline body, which has a sweet taste and aromatic odour. It consists of

Iodine, . . .	124, or one proportion;
Olefiant gas, . .	14, or one proportion.

A *hydrocarburet* of *bromine* is also formed by adding one part of hydrocarburet of iodine to two parts of bromine, contained in a glass tube. Instantaneous reaction ensues, attended with disengagement of caloric and a hissing noise; and two compounds, the bromuret of iodine and a liquid hydrocarburet of bromine, are generated. The latter, after being washed with a solution of potash, is colourless, heavier than water, very volatile, of a penetrating ethereal odour, and an exceedingly sweet taste, which it imparts to water. This compound is also formed by letting a drop of bromia fall into a flask full of olefiant gas.

OLEIC ACID. When potash and hog's lard are saponified, the margarate of the alkali separates in the form of a pearly-looking solid, while the fluid fat remains in solution, combined with the potash. When the alkali is separated by tartaric acid, the oily principle of fat is obtained, which is purified by saponifying it again and again, recovering two or three times, by which means the whole of the margarine is separated. As this oil has the property of saturating bases, and forming neutral compounds, it is called an acid. It is an oily fluid, without taste and smell; specific gravity 0·914. 100 of the oleic acid saturate, 16·58 of potash, 10·11 of soda, 7·52 of magnesia, 14·83 of zinc, and 13·93 of peroxide of copper.

OLERON LAWS; laws relating to maritime affairs, and so called because made by king Richard I., when at the isle of Oleron, in Aquitaine. See *Commercial Law*.

OLIBANUM. See *Frankincense*.

OLIGARCHY (from ὀλίγοι, few, and ἀρχη); that species of aristocracy where the supreme power rests with a few individuals—the worst of all governments.

OLIVA; a Cistercian abbey, not far from Dantzic, memorable for the peace concluded there, May 3, 1660, which terminated the war between Sweden, Poland, the emperor, and Brandenburg. John Casimir, king of Poland, renounced his claims on Sweden; Sweden renounced Courland; both powers acknowledged the independence of Prussia. In consequence of this, Sweden restored Drontheim and Bornholm to Denmark by the peace of Copenhagen, May 27, 1660, and concluded the peace of Kardis (1661) with Russia. The peace of Oliva is important because it laid the foundation of the subsequent political relations of the north of Europe. See J. Gottlob Boehme's *Acta Pacis Olivensis inedita* (Breslau, 1763 and 1765, 4to.)

OLIVAREZ, Gasparo de Guzman, count of, duke of Sanlucar, was born at Rome (where his father was ambassador to pope Sixtus V.), of a distinguished Spanish family. The house in which he came into the world was on the site of Nero's palace—a circumstance which gave rise to a comparison of his inflexible severity with the barbarities of that emperor. His father was suspected of having poisoned the pope. If this were the case, he was but poorly rewarded by his court, since his means were so limited that he was hardly able to educate his son at the university. The ambitious youth, however, insinuated himself into the favour of Philip IV., of whose amours he was the confident. The favourite soon supplanted the duke of Useda, as prime minister, and, for twenty-two years, his power was almost unlimited. The beginning of his administration was marked by measures of public utility; but his sole object soon became the extortion of money from the subjects to supply the expenses of the war with the neighbouring powers. His severity occasioned revolts in Catalonia and Andalusia. The Portuguese, disgusted by his government, threw off the Spanish yoke, and acknowledged the duke of Braganza king, in 1640. Olivarez communicated the intelligence of this event to the king, as a subject of congratulation, since it justified the confiscation of the enormous possessions of the duke in Spain. The war, however, was so fatal to Spain, whose armies were defeated by the French, and whose fleets were destroyed by the Dutch, that the king was finally compelled by the public discontent to dismiss his minister. (See *Spain*.) Olivarez was thus forced to retire from the stage, at the moment when, delivered from his formidable rival, Richelieu, he might have perhaps succeeded in retrieving affairs. He would probably have been recalled, had he not written an apology for his measures, by which he offended several powerful individuals, in consequence of which the king found it expedient to confine him at Toro, where he died in 1645.

OLIVE (*olea Europea*). This interesting tree, in the more northern districts, does not usually attain a greater height than eighteen or twenty feet, with a trunk one or two feet in diameter; but in warmer climates, it rises to the elevation of forty or fifty feet. It grows slowly, and is very long-lived. Notwithstanding the name, it is not a native of Europe; but it has been so long cultivated on the borders of the Mediterranean, that the period of its introduction from Asia is utterly unknown. In its general appearance, the olive-tree bears some resemblance to the willow, but it possesses very little beauty. As in the other species of the genus, the leaves are evergreen and entire; they are opposite, lanceolate, from one to two and a half inches long, and their inferior surface is covered with a scaly powder, which gives them a silvery appearance. The flowers are small, white, and are disposed in branching, axillary racemes; the corolla is monopetalous, surrounding two stamens and a single style. The fruit is an ovoid and more or less elongated drupe, with a thin, smooth, and usually blackish skin, containing a greenish soft pulp, adherent to a rough, oblong, and very hard stone; it is almost the only example of a fruit with an oily pulp. Like other plants which have been long cultivated, a great number of varieties have arisen from the influence of soil, exposure, and especially of different modes of cultivation. The olive was celebrated in the mythology of the ancients; olive wreaths were used to crown the brows of victors. By the Greeks and Romans it was revered, and was considered the emblem of peace and humility. It furnished that oil which, for a long time, was the only kind known, and which was employed by most nations in religious ceremonies. The athletes anointed their bodies with olive oil when preparing for gymnastic exercises; and it was very generally used in the same manner on coming out of the bath. The oil is still the principal product of the olive, and is consumed in immense quantities for culinary purposes, in many countries. It is inodorous, and the taste is very mild; but, if taken in large quantities, it is purgative. Great quantities are used in the manufacture of soap; and in the south of Europe it is burned in lamps. The fruit has too much asperity to be eaten in its natural state, except in one or two varieties; but after being prepared in various manners, it furnishes an important article of nourishment to the inhabitants of olive countries, and, moreover, makes its appearance on the tables of the rich in almost every part of the globe. The oil, together with the pickled fruit, is the source of a very extensive commerce between the Mediterranean and the north of Europe: in many districts, the whole population is entirely dependent on this branch of business. From the Levant, and particularly from some islands in the Archipelago, immense quantities of pickled olives are exported to the market of Constantinople. The oil which is obtained by simple expression, without the use of boiling water, is the best and purest; and that made in some parts of France is now the most highly esteemed.

A temperate and equable climate is essential to the constitution of the olive. Too much heat is as hurtful to it as severe cold. In Europe it has never been successfully cultivated north of latitude 45°; but it would seem that it is less the intensity than the suddenness of cold after mild weather, that is injurious; for the trees have been known to endure very severe cold, and again to be destroyed by an ordinary frost coming on after the sap has begun to ascend. The olive grows in every kind of soil, provided that it is not marshy. It is planted at intervals of twenty or thirty feet, as it requires plenty of air and light. It is easily multiplied by cuttings and pieces of the root, and so tenacious of life that a piece of the bark covered with earth has produced shoots and roots at the end of forty-two days. It is best raised from seed, or from wild plants taken from the woods, which are grafted with the desired variety. The proverb, that "no man who has planted an olive has ever tasted the fruit," though by no means literally true, has arisen from the extreme slowness of its growth. The fruit is ripe about the end of November or beginning of December; but the product is abundant only every other year. The wood is yellowish, fine-grained, hard, and susceptible of a brilliant polish. Although highly esteemed, it is too valuable a tree to be much employed in the arts.

Sixteen other species of olive are known—all trees or large shrubs, with opposite, or rarely alternate leaves, and small flowers, disposed in racemes or panicles. Among them is the *O. fragrans*, a native of China, Japan, and Cochin China: the flowers are highly odoriferous, and are used by the Chinese to mix with and perfume their tea, and also, together with the leaves, for adulterating it. The only species inhabiting the United States is the *O. Americana*, called, in some districts, *devil-wood*, according to

Michaux, on account of the excessive hardness and extremely difficult splitting of the wood. Notwithstanding this quality, it is neglected in the arts. The leaves are broad, lanceolate, coriaceous, entire, and shining. The fruit is a globose drupe, about twice as large as a pea, and purple when ripe. It is a large shrub, or small tree, sometimes, however, reaching the height of thirty or thirty-five feet, with a trunk of ten or twelve inches in diameter. It is a maritime species, and grows in company with the live-oak and cabbage-palm. It is found thinly disseminated along the sea-coast, from lat. 37° to Florida, and along the shores of the gulf of Mexico to Louisiana.

OLIVENITE; an ore of copper (q. v.).

OLIVES, Mount of; a hill near Jerusalem, from which it is separated by the valley of Jehoshaphat and the brook Kedron. It is still, as formerly, covered with olive trees.

OLIVIER, Guillaume Antoine; an eminent French naturalist and traveller, member of the institute and of the agricultural society of Paris. He was born near Frejus in 1756, and studied at Montpellier, where he received the degree of M. D., at the age of seventeen. Natural history, and especially botany and entomology, were his favourite pursuits; and at the age of twenty-three he went to Paris to assist in the composition of a work, relative to the natural history of the district in which that metropolis is situated. He was afterwards sent into England and Holland to collect materials for a general history of insects, and was also employed on the entomological part of the *Encyclopédie Méthodique*. The revolution having arrested the progress of both these enterprises. Olivier travelled to Persia, together with M. Bruguières, another man of science, on a diplomatic mission, planned by the minister Roland, whose death deprived the envoys of the financial resources and official protection on which they had calculated. Olivier returned to Paris in December, 1798, after an absence of six years, during which he visited Egypt, Greece, Turkey, Arabia, Persia, and other Eastern countries. He brought home numerous and valuable collections of curious objects of natural history, of which he published an account in his *Voyage dans l'Empire Ottoman, l'Egypte, et la Perse* (3 vols. 4to, with an atlas and plates.) He died at Lyons in 1814.

OLIVINE is found in olive-coloured grains and imperfect crystals, whose primary form is a right rectangular prism. These crystals are rarely found possessed of numerous modifications and of considerable dimensions. The cleavage parallel to the bases of the prism is highly perfect. Lustre, vitreous; colour various shades of green, as pistachio-green, olive-green, and grass-green; streak white; transparent or translucent; hardness between that of feldspar and quartz; specific gravity 3·44. With the foregoing description, the characters given of chrysolite (q. v.) agree in every important respect; and therefore these minerals are at present conceived to be identical. Those varieties have been called *chrysolite* which are crystallized, and possessed of handsome colours and a high degree of transparency. According to the best analyses, this species has the following composition:

Magnesia,	50·6
Silica,	40·5
Oxide of Iron,	8·9

Before the blow-pipe, olivine assumes a darker colour, but does not melt, nor lose its transparency. It may be artificially produced, by mingling its ingredients in the proper proportions, and exposing them to a high temperature. The original locality of imbedded crystallized olivine is not now known; the crystals are said, however, to come from Upper Egypt and are frequently brought to Europe by way of Constantinople. Less distinct crystals, and imbedded grains, are found in lava, in various kinds of basalt, &c., as in the neighbourhood of Vesuvius, in Saxony, Bohemia, Silesia, Hungary, &c. It occurs in large spheroidal masses, which are not pebbles, mixed with augite, in a rock called *traptuff*, at Kapfenstein, in Lower Stiria, and in Hessia. It is used as a gem of inferior value.

OLLA PODRIDA; a favourite dish of the Spaniards, consisting of several kinds of meat cut up and stewed together.—The same name is also given to a vase of odoriferous flowers and herbs. (See *Pot pourri*.) It is often used, metaphorically, to denote a medley.

OLMUTZ, or HOLOMAUC; a city of Moravia, with 12,890 inhabitants, situated between two branches of the March, thirty-five miles N. of Brunn; lat. 49° 32′ N.; lon. 17° 9′ E. It is surrounded by extensive fortifications, and contains several religious, literary, and charitable institutions. It is an archiepiscopal see. Olmutz was formerly the capital of Moravia, was captured by the Swedes in 1642, and besieged by the Prussians, without success, in 1758. Lafayette was confined, for a long time, in the prisons of the citadel. See *Lafayette*.

OLYMPIA; a town in ancient Elis (western Morea, near the town of Lagganico,) where Peregrinus Proteus burned himself, to show to the Greeks a new sight. (See *Peregrinus Porteus*.) It is now in ruins. The little plain of Antilala, which measures but an English mile and a quarter, from east to west, contains traces of buildings, which Fauvel and Pouqueville consider the remains of the Hippodrome, where the triumphal garland was once awarded. This little plain is bounded on the east by the steep banks of the Cladeus; on the west of the river lies Miracca; on the north are hills; and, on the south, the Alpheus surrounds the valley. Between the Typæon—a steep, rocky mountain—and the Alpheus, to which it reaches, lie the ruins, which have been taken for those of the Hippodrome, though Stanhope does not acknowledge them as such. Towards the south, enclosed by the Altis, lies the *stadium*, upon a low and now marshy spot, on the mountain. Pisa was situated six leagues from Olympia; and, from the agreement of the name of a fountain near Miracca, called *Potistirum*, with *Potistira*, the name of a fountain near Pisa, we appear justified in regarding the fragments of architecture at Miracca as the ruins of Pisa. So few are the remains of that Olympia, where, from the time of Chorœbus, the names of the conquerors were recorded for posterity with the most scrupulous exactness! The statue of Olympian Jupiter is treated of in a work of Siebenkees (Tubingen, 1795), and in Quatremère de Quincy's *Jupiter Olympien* (Paris, 1816, folio). The diligent investigations of the learned John Spencer Stanhope (see his *Olympia, Topography illustrative of the actual State of the Plain of Olympia, and of the Ruins of the City of Elis*, London, 1824, with sixteen beautifully engraved plans and views, after designs by Demint), appear to have thrown some light upon the field which bears the ruins of Olympia.

OLYMPIAD; a period, connected with the celebration of the Olympic games, by which the Greeks computed time. (See *Olympic Games*.) The Olympiad from which they began to reckon, was, according to Petavius, 777; according to Usher, 772; and according to Calvisius, 774 B. C. Gatterer, and most of the moderns, call it 776. The last Olympiad (the 304th) fell on the 440th year of the Christian era. The interval between two Olympiads was about four of our years, or a Greek tetraetris of forty-eight moons, and two intercalary months. The Olympiads were first named after the conquerors in the games;

but many errors might arise from this method, especially if there was no opportunity of immediately consulting the records at Olympia; therefore, in after times, they were otherwise distinguished: for instance, in Athens, to the name of the conqueror was added the name of the ruling archon; at Lacedæmon, the name of the ephori; at Argos, the name of the priestess of Juno; at Delphi, the name of the Pythia, &c. The records, thus made and kept under the superintendence of the magistrates, were preserved among the archives of each state, where every one might consult them. In later times, private persons took copies. Unfortunately, none have remained to us.

OLYMPIAS, a celebrated woman, daughter of Neoptolemus king of Epirus, married Philip, king of Macedonia, by whom she had Alexander the Great. Her haughtiness, and, more probably, her infidelity, led Philip to repudiate her, and to marry Cleopatra, the niece of king Attalus. The murder of Philip, which soon followed this disgrace, some have attributed to the intrigues of Olympias. Alexander treated her with respect, but did not allow her to take part in the government. Antipater succeeded Alexander in the government of Macedonia, and, on his own death, left the administration of the country to Polysperchon, who, to confirm his power, recalled Olympias from Epirus, whither she had fled, and confided to her the guardianship of the young son of Alexander. She now cruelly put to death Aridæus, son of Philip, with his wife Eurydice, as also Nicanor, the brother of Cassander, with one hundred leading men of Macedon, who were inimical to her interest. Such barbarities did not long remain unpunished. Cassander, son of Antipater, besieged her in Pydna, where she had retired with the remains of her family. She was obliged to surrender, after an obstinate siege, and was put to death.

OLYMPIC GAMES. The Olympic games were the most solemn and celebrated amongst the four sacred games of the Greeks, which were national festivals, and closely united the different Greek tribes. The name originated from the consecrated place Olympia, where they were celebrated, or from Jupiter Olympius, who had a famous temple on this spot. The Olympian plain is now called *Antilala*, being opposite the town of Lala. According to some traditions, Jupiter himself, after his victory over the Titans, founded these games; Mars gained the first prize in boxing; and Apollo overcame Mercury in the race. According to others Pelops founded them in honour of Jupiter. Others, again, ascribe them to the Argonauts. One of the *dactyli* (priests of Cybele, from mount Ida, whom Rhea, the wife of Saturn, had called from Crete to Elis, for the education of her son Jupiter), named Hercules, is also said to have founded them when he, with his four brothers (Pæoneus, Ida, Jasius, and Epimedes), proceeded from Crete to Elis. These four younger brothers contended with each other for the prize in racing Hercules crowned the victor with a wreath of olives, which was taken from a peculiarly beautiful olive tree, transplanted from the land of the Hyperboreans to the holy plain, near Pisa. This was afterwards alone employed for the victors' wreaths. Certain it is that, in the earliest times of Greece, games (probably of a religious nature) were celebrated in the neighbourhood of Pisa. They were several times interrupted and renewed; the first time by Iphitus, prince of Elis (884 B. C.); the second time by Chorœbus (776 or 777), from which time the Olympiads are dated. At the commencement, the inhabitants of Pisa had the superintendence of the games. But after Pisa had been destroyed by the Eleans, the latter undertook the superintendence, which they retained with few interruptions. They, also, were the umpires, whose number was not always the same. A solemn oath compelled them to the strictest impartiality. Officers were appointed to preserve order. From all parts, spectators streamed to Olympia, to attend the games. However, the priestesses of Ceres excepted, only men were permitted to be present. Females who violated this law were thrown from a rock. The games always commenced on the 11th of the month Hecatombæon (which nearly corresponds with our July), and continued five days. The competitors prepared themselves, during ten months previous, at the gymnasium at Elis. During the last thirty days, the exercises were conducted with as much regularity as at the games themselves. The festival began in the evening, with solemn sacrifices, and the games were commenced the next day at daybreak. These consisted in races on horseback and on foot, in leaping, throwing the discus, wrestling, boxing: musical and poetical contests concluded the whole. The honour of having gained a victory in the Olympic games was very great; it extended from the victor to his country, which was proud of owning him. The magnificence of the temple of Olympia has been destroyed, partly in consequence of the political decay of this country, partly by earthquakes. For an animated description of the Olympic games, see Barthélemy's *Jeune Anacharsis*.

OLYMPUS. Several mountains had, among the ancients, the name of *Olympus*. The most celebrated of them was situated in Thessaly, and is now called *Lacha*. The earliest Greeks looked upon it as the highest of all mountains, and as the central point of the earth's surface. It was the mountain of heaven, or of the gods, and the gods of Homer dwelt on its summit. Over its top there was supposed to be an opening into the metallic dome of heaven, which rested upon mountain-pillars, at the circumference of the earth. In after times, when the ideas of men respecting the universe and the gods were enlarged, the supreme beings were said to reside in the exterior sphere of the heavens, revolving round the space which embraced the planets; and this new abode of the gods, above the firmament of heaven, received the name of *Olympus*. Besides the opening at the top of the mountain, there were two gates in this celestial dome, which met the earth's circumference, one in the east, the other in the west, through which the sun and the night, with their train, ascended from the ocean into the heavens, and returned again. The gods themselves were called, from their dwelling-place, whether upon earth or in heaven, *Olympian* gods, and, as such, formed a body, of which Jupiter was the head. The twelve great gods composed the council of elders in Olympus, and the others, collectively, formed the general assembly. They did not dwell together in a single palace, but separate, in several, built upon the different tops of the many-peaked Olympus. At the highest summit stood the palace of Jupiter, where all assemblies and feasts were held in a large hall. From thence he could look down upon the earth, fill the heavens with clouds, and hurl his thunderbolts.

OMAN. See *Arabia*.

OMAR I., successor of Abubeker, and second caliph of the Mussulmans after Mohammed, also father-in-law of the prophet, began his reign A. D. 634, and is conspicuous among the conquerors who have desolated the face of the earth. His first expedition was against Damascus, capital of Syria; he drove the Greeks from this province and from Phœnicia. He took Jerusalem in the year 636, after a difficult siege. He entered the city upon a camel, laden with two bags, one of which contained fruit, and the other corn, which constituted all his provisions. A wooden platter was his only furniture; the earth was his seat. As the capitulation of Jerusalem was the model upon which the Mussulmans dictated many others, we will mention some of the chief articles. "The inhabitants shall retain their lives, their property, and their churches; but they shall build no new churches, nor place crosses upon those which they already have; they shall not ring the bells, but they are allowed to toll them. When a Mussulman travels through the city, they shall offer him hospitality for three days. They shall convert no one from Mohammedanism, nor shall they prevent their relations from embracing it. They shall use neither the language, nor the dress, nor the name of Mohammedans. They shall neither bear arms, nor sell wine; shall remain faithful to the caliph, and regularly pay their taxes." Omar's generals invaded Persia, defeated the army of Yezdegerd, and conquered the capital and kingdom. Amru, one of his generals, defeated the troops of the emperor Heraclius, near Antioch, in 638; Memphis and Alexandria surrendered; all Egypt and a part of Libya were conquered from the Romans. The story that the royal library at Alexandria was burned by order of Omar, has been of late questioned, but the probabilities seem to be in favour of its truth. The Mussulmans pursued their conquests far into Africa, but Omar did not live long to enjoy his glory. In the year 643, at the age of sixty-three, he was mortally wounded, with a knife, by a Persian slave. The nobles asked him to appoint a successor; but he refused, and especially rejected, with earnestness, the proposition of naming his son. "It is enough," said he, "that one out of my family has been forced to bear this burden." The caliphate thus became elective. (See *Caliph*.) Mohammedanism has never had a more virtuous and zealous apostle; he observed, strictly, all the precepts of the Koran, and was celebrated for his justice and clemency. He founded the city of Cairo, conquered 36,000 cities or castles, destroyed 4000 temples and churches, and built 1400 mosques. Omar is distinguished for having established the era of the Hegira. (q. v.) Mohammed had the highest esteem for Omar. He said that if God had wished to give another prophet to the world, his choice would have fallen upon Omar. He made nine times the pilgrimage to Mecca.

OMBROMETER. See *Rain-Gauge*.

OMEGA (*Greek*, signifying *great o*); the name for the Greek long *o*. It was the last letter in the Greek alphabet, as alpha was the first; and from the expression in Revelation (c. i. v. 8), "I am Alpha and Omega, the beginning and the ending, saith the Lord, which is, and which was, and which is to come, the Almighty," the signs of alpha and omega, (that is, Α Ω) became with the Christians symbolical hieroglyphics. Inscriptions (for instance, on tombstones, public documents, &c.) very often began with these two letters, meaning, "In the name of God;" as we find, to this day, treaties between Christian powers on the European continent beginning with the words "In the name of the Holy and Indivisible Trinity;" and we have seen, in the interior of Germany, bills of lading beginning with the words "In the name of God." The two Greek letters, as might be supposed, were believed to have great magical powers, and it was probably owing to usages that prevailed in the times of alchemy, that German physicians were accustomed to begin their prescriptions with Α Ω.

OMENS; certain accidental circumstances, which were once thought to predict good or evil. They were, 1. some bodily affection or emotion of the mind; 2. they came from outward objects; 3. they consisted in certain significant words. Among the first class of omens were spots upon the body, sudden restlessness and fear, especially an involuntary tremour in body and mind, palpitation of the heart, trembling of the eyes, or any other nervous affection, sneezing, &c. Among outward signs, a sudden light diffused through the house, or appearing in any place, was a good omen, for it was thought to indicate the presence of a deity. On the other hand, it was a bad omen if any thing strange happened to the images of the gods. Ominous words were lucky or unlucky, according to their signification and accidental relation. Such an omen was effectual only when it made an impression on the hearer. To avert an ill omen, a stone was sometimes thrown at whatever portended evil, or the ominous animal was killed, that the prediction of evil might be turned upon him. Words of ill omen were thrown back on the person who spoke them, by the expression, "On thine own head." There were also peculiar magic ceremonies to avert portended evil. A piece of thorny or barren wood was burned to ashes, and thrown into a brook, or into the sea, upon the occurrence of a bad omen. It was the general custom for people, when evil omens occurred, to leave the occupation in which they were engaged, to be resumed at a more favourable opportunity.

OMER, St; a city in the northern part of France, department Pas-de Calais, strongly fortified, and containing 20,000 inhabitants, almost all Flemish. The cathedral is a fine Gothic building, in which are seen a descent from the cross by Rubens, and the tomb of St Omer. The English college, formerly celebrated as the place of education for the English and Irish Catholics, is now occupied as a military hospital. Lat. 50° 44′ N.; lon. 2° 15′ E.

OMMEGANCK; born in 1755; one of the most celebrated Dutch landscape painters, whose works are distinguished for good taste, and for freshness and warmth of colouring. He died at Antwerp, January 18, 1826.

OMMIADES. See *Caliph*.

OMNIBUS; a word first used in France for long carriages, which ply between different parts of the city. The term is derived from the dative plural of the Latin adjective, *Omnes*, all; *i. e. for all*; the carriages being adapted for general convenience, without distinction of seats. Omnibuses are now common in every large town in Britain.

OMNIUM; a term in use among stockbrokers and speculators in the funds, to express the whole of the articles which the subscribers to a loan receive from government. Thus, if the subscribers, according to their agreement with government, are to have, for every hundred pounds advanced, a certain sum in 3 per cent. consols, a further sum in 4 per cents., and a proportion of the long annuities, the blank receipts which they receive for making the instalments on the several articles, are, when disposed of independently of each other, as the 3 per cent. consols only, called *scrip* (a contraction of *subscriptions*); when the receipts are sold together as originally received, they are usually called *omnium*. As the omnium of every loan is the subject of extensive speculations, it generally is liable to considerable variations with respect to its current price, sometimes selling at a high premium, at other times at a discount, according to the circumstances which take place between the agreement for the loan and the day fixed for paying the last instalment.

OMPHALE; daughter of the Lydian king Jardanus, and wife of Tmolus, after whose death she administered the government. Hercules was sold to her for a slave by Mercury, and performed some remarkable exploits in her service. Omphale rewarded him by submitting to his embraces, and bore him a son. Hercules was so enamoured of her, that, to please her, he assumed the garments of a female, adorned his fingers with gold rings, had his hair curled, and spun among her female slaves, while she wore the lion's skin, and wielded the club. Omphale governed with great severity, and was no less licentious and extravagant than cruel.

OMS. See *Cerberus*.

ON. See *Heliopolis*.

ON DIT; a French term signifying *people say*; hence often used to designate a flying rumour. The plural *les on dits* is used.

ONEIDA; a lake of New York, twenty miles long. From its west end flows Oneida river, which joins with Seneca river, to form Oswego river, flowing into lake Ontaria. Oneida lake abounds with fish, such as salmon, trout, salmon-trout, Oswego bass, pike, and catfish. The lands around this lake are very rich, but rather low and level.

ONION *(allium)*; a genus of plants including, besides the common onion, the echalote, garlic, and leek. *(See these three articles.)* The species of *allium* are herbaceous plants, with biennial or perennial bulbous roots. Their leaves are flat, or cylindrical, and fistulous, and sheathing at base. The flowers are disposed in simple umbels, more or less dense, at the summit of the stems. The calyx is deeply parted into six equal divisions; there is no corolla, and the stamens are six in number; the capsule consists of three cells, each containing several seeds. In the place of the flowers there are frequently developed, in certain species, small bulbs, which, if planted, will reproduce the vegetable. About sixty species are known. The onion proper *(A. cepa)* is abundantly cultivated throughout Europe and in the United States of America. The stem is three or four feet high, inflated, and terminated by a dense globose head of reddish flowers; the leaves are radical, cylindrical and hollow. Its use as an alimentary plant is well known. The red variety is more acrid than the white, and both become essentially milder in warm climates. The onion requires a rich and rather moist soil.

ONOMATOPŒIA (*ὀνοματοποιΐα*; *ὄνομα*, name, *ποιέω*, to make); the formation of words in such a manner that the sound shall imitate the sense. Thus, in the case of sounds, the words *buzz*, *crash*, *roar*, are evidently formed to imitate the sounds themselves; sometimes the word expressing an object is formed to imitate the sound produced by that object. See *Language*.

ONONDAGA; a post-township and capital of Onondaga county, New York, 134 miles west-north-west of Albany, and fifty west of Utica. Its extent is nine miles by ten. A broad valley, of exuberant fertility, extends north and south through the eastern part, bounded by high, swelling ridges on each side. Through this valley of rich alluvion, called *Onondaga Hollow*, flows Onondaga creek, northward to Onondaga lake, in the town of Salina. The whole township of Onondaga contained, in 1831, 5668 inhabitants, and seems not to be rapidly increasing. The post-borough of Onondaga, the seat of the county buildings, is situated on a delightful eminence. The post-village of Onondaga Hollow is about one mile east of the court-house. It has an arsenal belonging to the state, and many mechanical establishments. Onondaga Castle is the chief town of the remnant of the Onondaga tribe of Indians. It is three miles south of the village of Onondaga Hollow, and contains about fifty Indian houses, and about 140 persons. Their houses are built of hewn logs. They annually receive 1000 dollars from the state of New York.

ONTARIO; one of the five great lakes which separate Canada from the United States. It is situated between 43° and 44° N. lat., and 76° and 80° W. lon. Its form is elliptical, and a central line drawn from its south-west to its north-east extremity measures 190 miles. Its greatest breadth is about fifty-five, and its medial breadth about forty miles. Towards the western part of the lake, it receives Niagara river; and from this point to the St Lawrence river, which flows from the north-east part of the lake, the line dividing Canada from the United States is the middle of the lake. Nearly half of lake Ontario is, therefore, in the state of New York. It is very deep, with sufficient water in every part, and has many good harbours. It is never entirely closed by ice, and is computed, from some soundings, to be 500 feet deep. If this be correct, the bottom must be considerably below the level of the Atlantic ocean. Its surface is only 231 feet above tide water at Three Rivers on the St Lawrence, and at Albany on the Hudson. Besides Niagara river, lake Ontario receives from New York the Genessee, Oswego, and Black rivers, and a large number of small streams. Among its bays, the largest are Chaumont, Sodus, Little Sodus, Teoronto, and Braddock's, on the side of the United States; Quinte, Burlington, and many large ones on the Canada side, of which our maps do not give the names. Stony and Grenadier islands are at the eastern end; and there are some around Quinte bay, in Canada. Wolfe or Grand island is at the entrance of the river St Lawrence; and the well-known Thousand islands are just below Wolfe island. Lake Ontario abounds with excellent fish of various kinds. The most celebrated of these are the Oswego bass, the salmon, trout, and salmon-trout. The shores of the lake embrace a great variety of land: the greater part of it is pretty good, with the exception of marshy ground. Along its southern border is that remarkable ridge called the *ridge road*, or *alluvial way*. See *Ridge Road*.

ONTOLOGICAL PROOF is that proof of the existence of God which is drawn from the abstract idea of his being. Something similar to this is to be found as early as the Stoic Cleanthes. But Anselm of Canterbury and Descartes chiefly developed this species of proof.

ONTOLOGY, also ONTOSOPHY: the doctrine of being; a name formerly given to that branch of metaphysics which treats of the essential qualities of things. It investigated the nature, 1. of things in general, their possibility, reality, and necessity; 2. of substance and accidence, cause, effect, and mutual operation; 3. of quantity, quality, similarity, and equality of things; 4. of space and time; and, 5. of the simple and the compound. Kant has overthrown the ontology of the ancient school.

ONYCHITES. See *Alabaster*.

ONYX. See *Quartz*.

OONALASHKA. See *Aleutian Islands*.

OOST; Dutch for *east*, corresponding to the German *Ost*. (q. v.)

OPAL occurs in small reniform, botryoidal, and stalactitic shapes, and large tuberose concretions; surface of the former smooth, of the latter rough; composition impalpable; fracture conchoidal, even. It also occurs in pseudomorphoses of carbonate of lime; fracture conchoidal, of various degrees of perfection, sometimes highly perfect; lustre vitreous, in some varieties inclining to resinous; colour white, yellow, red, brown, green, and grey; none of them lively, except some red and green ones; dark colours, owing to foreign admixtures; streak white; transparent, or translucent, sometimes only on the edges, or even opaque, if the colours be very dark; lively play of light observable in some varities; others show different colours by reflected and transmitted light; hardness below quartz;

specific gravity. 2·091. The present species is treated of by many mineralogical writers under that of quartz; while others have subdivided its varieties into numerous species. The chief of these varieties, sub-species, or species, as they have been regarded by different authors, are, 1. *noble opal*, which exhibits brilliant and changeable reflections of green, blue, yellow, and red; 2. *fire opal*, which simply affords a red reflection; 3. *common opal*, whose colours are white, green, yellow, and red, but without the play of colours; 4. *semi-opal*, the varieties of which differ from those of common opal in being more opaque; 5. *wood opal*, which appears in the shape of trunks, branches, and roots of trees; 6. *hydrophane*, a variety without transparency, but assuming it if thrown into water; 7. *hyalite*, which occurs in small reniform, botryoidal, and sometimes stalactitic shapes, and is transparent; 8. *menilite*, which occurs in tuberose masses, and is opaque; 9. *siliceous sinter*, which is merely a deposit from a hot spring.—Three varieties of opal, 1. hyalite, analyzed by Bucholz, 2. precious opal, and 3. menilite, both analyzed by Klaproth, have yielded,

Silica	1.	92·00	2.	90·00.	3.	85·50.
Water		6·33.		10.		11.

The last contains, like several other varieties, a small proportion of iron, alumina, lime, and carbon. Before the blow-pipe, water is disengaged, the mineral decrepitates and becomes opaque, and shows the properties of pure silica. Opal is less frequently met with in nature than quartz. Generally it forms short, irregular veins, which, for the most part, are found in porphyry. It accompanies calcedony in the vesicular cavities of amygdaloidal rocks, and even in agate balls. Menilite is found in adhesive slate. Some varieties are met with in metalliferous veins, and in petrifactions in sandstone. Almost the only locality of precious opal known is at Czarwenitza, in Hungary, where it is found in porphyry. Lately, it has been met with in the Faroe islands, and also near Gracias a Dios, in South America. Fire opal comes from Zimapan, in Mexico. Common opal is found in large quantity in Hungary, Saxony, and the Faroe islands. An apple-green variety is found at Kohemutz, in Silesia, which is called *chloropal*. Hyalite is found in amygdaloidal rocks in Bohemia and Hungary, and also in the United States, in Georgia, lining cavities in the buhr-stone. Menilite occurs imbedded in adhesive clay at Mevil Moutant, near Paris. Wood opal is found at Kremnitz and Telkobanya, in Hungary, and in many districts of Transylvania. Precious opal is considered as a very precious gem, and is generally cut with a convex surface. Its value depends upon its size, purity, and the vivid colours which it possesses. The phenomenon of the play of colours has not hitherto been satisfactorily explained. According to Hauy, it is the consequence of fissures in the interior filled with thin films of air, which reflect coloured light, according to the law of Newton's coloured rings. If this were the fact, opal would present nothing else but a kind of iridescence, and the beauty of opal would be owing, as Hauy expresses it, only to its imperfections. But these colours often keep constant directions within single parts of the mass; and in specimens not cut in the usual convex form, but presenting even faces, it is often possible to observe distinct images reflected exactly as in the moonstone, or in corundum. The play of colours, seems, therefore, to be connected with the regular structure of the mineral.

OPERA. The opera is a musical drama. The music makes an essential part of it; and in this it is distinguished from other dramas accompanied by music. Song and music may be said to be the poetry of the opera, and, though the opera remains a drama, and never ought to lose this character, yet, as music is lyrical, the opera must be principally directed to the expression of feelings and passions. Comparatively little display of character and action can be expected from it. An opera, like every work of art, must bear the stamp of unity; one character must prevail through the whole, as the solemn and grave in Mozart's Magic Flute (though there are *naïf* passages interspersed in it,) or the glowing, vivid colouring of Figaro, or the heroic elevation of Gluck's *Alceste*. It is further necessary to give individuality of character by means of the music, and the lyrical monologues (airs, *cavatine*, *ariosos*) and dialogues (*duettos*, *terzette*, &c.) must alternate in pleasing variety. But our limits do not allow us to give a description of the various parts requisite to these exquisite productions. According as the serious or the comic character prevails in the opera, it is termed *opera seria* or *opera buffa*. There is also a style—*mezzo stilo*—between both, the limits of which it is, of course, impossible to define. *Grand opera* is the name given to that kind which is confined to music and song. The *recitativo* is an essential part of this. By *operetta* is understood a short musical drama of a light character. The Italians have a kind of musical dramas called *intermezzo*. (See *Interlude*.) The French *vaudeville* belongs to this species of compositions, but not the German melodrama, in which music, indeed, is introduced either by itself or in connexion with the dialogue, but no singing takes place.

Origin of the Italian Opera.—About the year 1594, three young noblemen of Florence, who were attached to each other by a similarity of tastes and pursuits, and a love of poetry and music, conceived the idea of reviving the chanted declamation of the Greek tragedy: they procured the poet Rinuccini to write a drama on the story of Daphne, which was set to music by Peri, the most celebrated musician of the age, assisted by count Giacomo Corsi, who, though only an amateur, was also, for the period, a good musician: the piece, like the Mask of Comus, was privately represented, and in the palace of Corsi. The interlocutors, or singers, were the author and his friends; and the orchestra of his first opera consisted but of four instruments, viz. a harpsichord, a harp, a *viol di gamba*, and lute. There was no attempt at airs; and the recitative—if such it could be called—was merely a kind of measured intonation, which would appear to us insufferably languid and monotonous; yet it caused, at the time, an extraordinary sensation, and was frequently repeated. Four years afterwards, the first public opera, entitled *Euridice*, written by the same poet, and set by the same musician, was represented at the theatre of Florence, in honour of the marriage of Mary de' Medici with Henry the Fourth of France. On this occasion, the introduction of Anacreontic stanzas, set to music, and a chorus at the end of each act, were the first imperfect indications of the airs and choruses of the modern opera. Monteverde, a Milanese musician, improved the recitative, by giving it more flow and expression; he set the opera of Ariadne, by Rinuccini, for the court of Mantua; and in the opera of Glasone, set by Cavili and Cicoguini, for the Venetians (1649,) occur the first *airs* connected in sentiment and spirit with the dialogue. According to another story of the origin of the opera, John Sulpitius, about 1486, exhibited little dramas, accompanied with music, in the market-place at Rome, and also before the pope and some cardinals. The commencement of the *opera seria* at Rome reminds us of the wagon of Thespis and his lees-besmeared company of strollers. The first performance of this kind, consisting of scenes in recitative and airs, was exhibited in a cart during the carnival of 1606, by the musician Quagliata, and four or five of his friends. The first regular serious opera performed at Naples was in 1615: it was entitled *Amor non ha Legge*. During the next half century, the opera not only did not improve, but it degenerated: it became in Italy what it was in France during the last century—a grand spectacle addressed to the eye, in which the poetry and music were the last things considered, while the scenery, mechanical illusions, and pantomime, were on the most splendid scale. As Goldoni said long afterwards of the grand opera at Paris, *C'était le paradis des yeux et l'enfer des oreilles*.—The first *opera buffa* is said to have been represented at Venice in 1624, where also the first stage for operas was erected in 1637. In 1646, the opera was transplanted to France by cardinal Mazarin. (See *France*, division, *Dramatic Poetry*, and *Art*.) In Germany, carnival plays, in which the performance consisted of singing, existed even in the times of Hans Sachs, (died 1567.) Opitz and others imitated the Italian pieces; but the first German original opera is said to have been Adam and Eve, played in 1678, in Hamburg. Some consider The Devil let Loose the first comic opera in Germany. In Sweden, the first Swedish original opera was performed in 1774. The Italian opera was introduced into England in the seventeenth century. Handel effected a revolution there, which, however, did not exert a permanent influence on the English opera. The Italian opera did not penetrate into Spain until the second half of the eighteenth century. The Italians draw the line between the *opera seria* and *opera buffa* much more distinctly than the Germans, so that the Italian *opera seria* appears almost insipid to a German; the *buffa*, on the contrary, is quite grotesque and quite national, and produces a lively effect when played by Italians.

Among the most distinguished Italian writers of operas are Apostolo Zeno, and particularly Metastasio, who, in the eighteenth century, carried the Italian opera to so great a height. Among the writers of comic operas we must mention Goldoni. Among their composers, Sacchini, Piccini, Jomelli, Cimarosa, Salieri, Paisiello, Zingarelli, Martini, Rossini, Generali, &c., are distinguished. (See Arteaga's *History of the Italian Opera*.) Among the French writers of operas are Quinault, La Fontaine, La Motte, Marmontel, Favart, Sedaine, Etienne, Jouy, Scribe, Théaulon. Among the French composers are Grétry, Monsigny, Rousseau, Dalayrac, Isouard, Boyeldieu, Catel, Méhul, and the nationalized Spontini and Cherubini. Among the English writers of operas are Addison, Gay, Fielding, Kenrick, &c. The English have no distinguished composers of operas.

The German opera, as it now exists, originated from the *operetta*, chiefly cultivated in the latter half of the eighteenth century by Weisse and Hiller. The pieces which are sung became longer and longer, so that at last they took the form of the *opera seria*; and when the *finale*, invented by the Italians, was introduced, general preference was given to that kind of opera. Spoken dialogue and song alternate in it; but in recent times, the great German composers have changed the prose dialogue also into recitative. The romantic opera is a German production, and composed of the Italian *opera seria* and *opera buffa*. Among the most perfect of the German romantic operas are the magic Flute, Don Juan, *Der Freischutz*, Oberon, &c. Some of the poets who have written for the German opera are Goethe, J. G. Jacobi, Herklots, Huber, Kotzebue, Schikaneder, Kind, Gehe, &c. The German composers are Gluck, Hasse, Mozart, Winter, Weigl, Reichardt, Kunzen, Vogler, Beethoven, Weber, Spohr, Kreutzer, &c.

OPERA GLASS, in optics; so called from its use in theatres, &c. It is sometimes called a *diagonal perspective*, from its construction. It consists of a tube about four inches long, in each side of which there is a hole exactly against the middle of a plane mirror, which reflects the rays falling upon it to the convex glass, through which they are refracted to the concave eyeglass, whence they emerge parallel to the eye at the hole in the tube. This instrument is not intended to magnify objects more than about two or three times. It is intended for viewing persons at a small distance, so that no one shall know who is observed; for the instrument points to a different object from that which is viewed; and as there is a hole on each side, it is impossible to know on which hand the object is situated which is looked at.

OPHIR; a country or city to which the Hebrews made voyages in the time of David and Solomon, bringing home gold, ivory, spices, peacocks, &c. Commentators are not agreed as to its situation, but it seems most probably to have been on the eastern coast of Africa, or in the East Indies.

OPHITES; a Gnostic sect, which rose in the second century, and held, in common with the Valentinians (see *Gnostics*), the doctrines of the two principles, of *æons*, and of the theogony therewith connected. They were peculiar in the worship of a living serpent, which they considered as the emblem of the sensual principle in man and of prudence (*sophia*). The Ophites kissed the snake, in which they honoured the tempter of Eve in paradise, on the same principle as the pagans worshipped evil deities. Hammer has explained the signification of this emblem, and its worship, in a different manner, in the *Fundgruben des Orients* (6th vol., No. 1).

OPHIUCHUS, or SERPENTARIUS, and SERPENS; one of the old constellations, which was anciently called *Æsculapius*.

OPHTHALMIA (ὀφθαλμος, eye); an inflammation of the mucous membrane, which covers the globe of the eye and of the correspondent surface of the eyelids. It is either acute or chronic. It differs very much in its exciting causes. Residence in damp or sandy countries, exposure to the sun, sudden changes of weather, are among the most usual causes. It may also be produced by the suppression of some of the usual discharges, and also by the scrofulous and venereal virus. Its characteristic marks are pain and redness. Of all diseases of the eye it is most frequent.

OPIE, JOHN, professor of painting at the royal academy, was born in 1761, in Cornwall. His father was a carpenter, and he was intended for the same occupation; but when very young, he manifested a taste for study, and a strong predilection for the arts of design. When about nineteen, he removed to London; but his pictures were not admitted into the exhibition at Somerset house till 1786. He afterwards became an academician. He published An Inquiry into the Cultivation of the Arts of Design in England, and delivered lectures at the royal institution. In 1804, he succeeded Fuseli as professor of painting, and read four lectures on painting, which have been published. He died in 1807. He holds a respectable station among British painters.

OPITZ, or OPITIUS, a celebrated German poet of the seventeenth century, born at Bunzlau, in Silesia, in 1597, published first a collection of Latin poems, entitled *Strenarum Libellus*, in 1616. The following year he became a teacher at the gymnasium of Benthem, on the Oder, and, besides poetical compositions, he published his *Aristarchus, sive de Contemptu Linguæ Teutonicæ* (4to). He then studied at Frankfort on the Oder, and, having afterwards visited many cities in Germany and Holland, he went, in 1621, to the court of the duke of Liegnitz; whence, in about a year, he removed, to become professor of philosophy and classical literature at the university of Weissenburg, then newly founded by Bethlen Gabor. The situation proving unpleasant, he soon returned to Bunzlau, and afterwards to Liegnitz. Becoming distinguished for his talents, he went to Vienna, where the emperor Ferdinand II. bestowed on him the poetical crown, and afterwards gave him letters of nobility, when he assumed the title of *von Boberfeld*. He returned to Silesia, and became secretary to the burgrave of Dohna; but, on losing his patron by death, he entered anew into the service of the duke of Liegnitz. At length he was appointed secretary and historiographer to the king of Poland, and passed the last five years of his life at Dantzic, where he died August 20, 1639. Among his works are a poem on mount Vesuvius, Silvæ, Epigrams, &c. Opitz was the creator of a new and more correct poetical style in Germany, founded on the model of the ancient classics, and of a form of versification accommodated to rules of prosody, and resting on the measure of syllables, and not their number. He was well acquainted with the ancients, and had stored his mind with useful knowledge, so that his poems, especially the larger ones, are rich in thought and invention. The language is indebted to him for new connexions and forms, greater smoothness and correctness, expressiveness, and euphony.

OPIUM; the inspissated juice of a species of poppy (*papaver somniferum*), a native, originally, of the East, but now naturalized throughout the greater part of Europe. The root of this plant is annual, giving out a stem from two to four feet high, which, as well as the leaves, is glaucous. The flowers are terminal, white or light gray, and three or four inches in diameter: in the wild plant they are provided with only four petals, but in the double varieties the petals are very numerous, and vary in colour from white to red and to deep violet, with a hundred intervening shades. The capsules contain a prodigious number of seeds. It is found in most gardens as an ornamental plant, and is, besides, cultivated extensively in many parts of Europe, but only for the sake of the oil which is obtained from the seeds. It is from the East, from different parts of the Turkish empire, and from Hindoostan, that the opium of commerce is chiefly procured. The finest opium is obtained by making longitudinal incisions in the green capsules in the evening; the milky juice which flows out is suffered to remain till the following evening to acquire consistence, when it is removed, and the process repeated. When the seeds are the sole object, the time of sowing is in the autumn, and at the end of the following July or beginning of August, the crop is ready for harvesting: before cutting off the capsules, it is better to shake them on cloths spread for the purpose; or, if this precaution is not taken, they should be removed with great care, keeping them always in an upright position until they are placed in sacks; otherwise a portion of the seed will be lost: the capsules should then be exposed to the air to complete their desiccation, and the seed, after being separated, should be kept in a dry place. The oil has an agreeable taste, and, after olive-oil, is esteemed the best for culinary purposes. In Germany and the Netherlands, it is almost the only kind used. The seeds, after being roasted and prepared in various manners, were employed by the Romans in making several sorts of cakes and dainties; and this custom is still prevalent in some parts of the north of France.

Opium is the most energetic of narcotics, and at the same time one of the most precious of all medicines, and is employed in the greatest variety of cases. It is invaluable in procuring relief from pain at all times, and is an efficient remedy in choleras, spasmodic affections, convulsions, tetanus, neuralgias, &c., &c. It is most commonly employed for the purpose of procuring sleep; but its habitual use is attended with similar, if not worse effects, than the abuse of ardent spirits. A full dose is intoxicating and exhilarating; but, if taken in large quantities, it produces dangerous and fatal effects. An emetic should be immediately resorted to in such cases. Laudanum is a liquid preparation of opium, made with alcohol, and is similar in its effects on the human system. Madden, in his travels in Turkey, &c., speaking of the opium eaters of Constantinople, whom he saw in a coffee-house frequented by them, says, "Their gestures were frightful; those who were completely under the influence of the opium talked incoherently; their features were flushed; their eyes had an unnatural brilliancy, and the general expression of their countenances was horribly wild. The effect is usually produced in two hours, and lasts four or five. The dose varies from three grains to a drachm. The debility, both moral and physical, attendant on its excitement, is terrible; the appetite is soon destroyed, and every fibre in the body trembles; the nerves of the neck become affected, and the muscles get rigid: several I have seen in this place who had wry necks and contracted fingers, but still cannot abandon the custom. They are miserable till the hour arrives for taking their daily dose."

The opium of commerce is in masses of different sizes. It is somewhat hard, of a brown colour, and a bitter, acrid, and nauseous taste. Its odour is peculiar and characteristic. It softens with a gentle heat, and, when more heated in the air, it kindles, but does not burn readily. It contains acidulous meconate of morphia, extractive matter, mucilage, fecula, resin, fixed oil, caoutchouc, a vegeto-animal substance, debris of vegetable fibres, occasionally a little sand, and small white pebbles, together with the white crystalline salt of opium, now known under the name of *narcotine*. If we treat opium first with abundance of ether, a tincture of a deep yellow shade is obtained, from which there gradually falls a powder, insoluble in water, alcohol and ether, and, when distilled, it affords a considerable quantity of ammonia. The ethereous tincture, freed from this yellowish powder, yields, on evaporation, crystals impregnated with a viscid oil, among which small masses, of more consistence, are seen to float. These are caoutchouc, which may be separated from the oil by a fine tube. The oily liquid is to be decanted, in order to insulate the crystals, which are then treated with boiling alcohol. On cooling, this affords the narcotine, slightly impregnated with caoutchouc. From this a new solution frees them completely. Hence, by this process, are eliminated four different products: 1. a fixed oil; 2. caoutchouc; 3. a vegeto-animal substance; 4. narcotine. The opium, after being thus exhausted by ether, when dissolved in water, affords solutions equally acid as ordinary opium, and which comport themselves with magnesia or ammonia, as if no ether had been applied to it. (See *Morphia*.) It is obvious, therefore, that the two crystalline bodies, narcotine and morphia, exist in opium quite independent of each other. In the eighth and ninth volumes of the Journal of Science of the Royal Institution of Great Britain, and in the first volume of the Edinburgh Philosophical Journal, are two valuable papers on the manufacture of opium. According to Orfila, a dangerous dose of opium is rather aggravated than counteracted by vinegar. The proper remedy is a powerful emetic, such as sulphate of zinc, or sulphate of copper.

OPODELDOC; a solution of soap and alcohol, with the addition of camphor and volatile oils. It is used externally against rheumatic pains, sprains, bruises, and other like complaints.

OPORTO, or PORTO, next to Lisbon the most considerable city of Portugal, is situated in the province Entre Minho e Duero, in a narrow valley, on both sides of the Duero; lat. 41° 11′ N.; lon. 8° 40′ W.; about 160 miles north of Lisbon. It contains eleven public squares, ninety churches, seventeen monasteries, fourteen hospitals, and 70,000 inhabitants. The city is distinguished for its cleanliness, and on the river there are fine quays. The harbour is excellent, and protected by a fortress: 1200 ships enter it yearly. The mouth of the river, however, is obstructed by rocks and quicksands. Oporto is the emporium for the export of Port wine, which receives its name from this city, but is chiefly produced in the province of Tras os Montes. The amount exported yearly varies from 50,000 to 70,000 pipes, of which the greatest part goes to Great Britain. (See *Port.*) The wine trade is principally in the hands of a company, chartered in 1756, which has also thirty brandy distilleries. There are about thirty British houses established in Oporto. Other articles of export are oil, sumach, linen, and oranges. The imports are woollen, cotton, and hardware manufactures, mainly from Britain; salt fish, hemp, and flax; and, from the United States, rice. The country seats in the environs, called *quintas*, are beautifully situated. The climate is cold for the latitude. Oporto derives its origin from the small place Cale, which lay on the other side of the river; the present site, being found more commodious for shipping, acquired the name of *Portus Cale;* whence the Portuguese *O Porto* (the Port); while the kingdom itself received the name of *Portugal.* Oporto was occupied by the French in 1808, and it suffered much in its commerce by the usurpation of don Miguel, many of its citizens having fallen victims to the troubles which agitated the country, or forced them to flee from it. See *Portugal.*

OPOSSUM (*didelphis*). These extraordinary animals belong to the *marsupialia*, or those quadrupeds the females of which are furnished with a pouch in the abdomen; they are peculiar to the American continent; and one, and the best known of them, is very common in the United States: this is the *D. Virginiana*, the general colour of which is whitish-gray; the whole hair is of a wool-like softness; it is short on the face and body, but long on the legs. The tail is thick and black for upwards of three inches at base, and is covered with small scales. The opossum is seldom or never to be seen in the day time, being a nocturnal and timid animal, depending far more on his natural sagacity than on his strength for his safety. His motions on the ground are awkward and clumsy; but on the branches of a tree he moves with great celerity and ease, using his tail to assist his motions. This organ is prehensile, and enables the animal to suspend himself by a branch, either when in pursuit of food, or when he wishes to descend. His usual prey is birds, some of the smaller quadrupeds, eggs, &c., though he oftentimes commits great depredations in orchards; his favourite food of this kind, however, is the persimmon, on which he becomes very fat. The flesh is good, resembling in flavour that of a young pig. The wool, especially of those killed during the winter, is very long and fine, and might be advantageously employed in many manufactures. The places in which the opossum is usually found are thick woods, where they generally dwell in the hollow of decayed trees. They are usually hunted in the autumn, after the first frosts: as soon as they perceive the approach of danger, instead of taking to flight, they lie close to the branch on which they were clinging; when they are discovered, they are taken by shaking the branch violently; they then drop to the ground, and, if the hunter is unaccompanied by dogs, they steal slowly away, and, gathering themselves into as small a compass as possible, remain perfectly quiet, as if feigning death. After remaining thus till they think themselves secure, they steal off; if, however, any sudden noise be made, they again assume their death-like position, in which they will persevere even when taken up and handled. This well-known attribute of the opossum has become a proverb, and "He is playing 'possum," is applied, in some parts of the country, to any one thought to be acting deceitfully. The female has ten to fifteen young, who are, for a long time, nourished in the pouch, and to which they resort on the appearance of any danger. When they are too large to be thus carried, they cling to the mother by twisting the extremity of their tails round the base of hers. When taken young, they are readily tamed, but are mischievous pets. Wonderful medical virtues were formerly attributed to the tail of this animal, in a great variety of cases.

OPPIAN; a Greek poet, who lived under the emperor Caracalla, in the beginning of the third century. He was a native of Cilicia, and apparently of Grecian descent. He wrote poems distinguished for elegance and sublimity; but two only of his productions are now extant, his *Halieuticon*, or five books on fishing, and four books on hunting, entitled *Cynægeticon.* Caracalla was so pleased with it, that he gave the author a piece of gold for every verse, whence the poem has been styled the "golden verses" of Oppian. He died in his thirtieth year (A. D. 213,) and his countrymen erected statues in honour of him. The best edition of his works is that of Schneider (Strasburg, 1776, 8vo; there is another by the same editor, 1813, 8vo). His *Halieutics* have been translated into English, by Jones (Oxford, 1722, 8vo).

OPPOSITION, in astronomy, is that aspect of any two heavenly bodies when they are diametrically opposite each other, or 180°, that is, a semicircle, apart. See *Aspect.*

OPPOSITION, as this word is understood in reference to the deliberative assemblies of free representative governments, is something not only wholly unknown to the ancients, but also of but recent origin. It is difficult to fix precisely the period when *opposition*, in the modern meaning of the word, began; but we shall probably not be far from the truth when we date the more regular opposition from the accession of the house of Hanover to the throne of England. There existed, indeed, before, opposing parties in England, and in other countries, but not a regular parliamentary opposition. Opposition is an indispensable ingredient of free representative governments: it is both a check and a stimulus, and it is a strong proof of the judicious organization of modern governments, in comparison to those of antiquity, that opposition has become more truly an essential part than a hostile element of government, and, laughable as the expression, "his majesty's opposition," sounded, when used, some years ago, in the British parliament, it contained a great truth; because, though the opposition may struggle against an existing administration, it contributes to the soundness and vigour of the body politic. It is impossible to make one, accustomed only to absolute governments, or those of ancient states, understand the true meaning of a modern opposition; to him, all opposition is rebellious. Nothing contributes more to form an independent and intelligent spirit in a nation, than a persevering and judicious opposition, which does not weaken its efficacy by blindly resisting what is good. A full discussion of this subject belongs to a systematic work on governments; and well would it be, were there an author to treat all the parts of free governments with a sagaciousness like that of the immortal Florentine, in his development of absolute power. Great Britain, France, and the United States, are the only countries in which *opposition*, in the true meaning of the word, as yet exists.

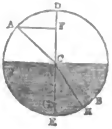
OPS. See *Cybele*.

OPTICS; the science of vision, which treats of the changes which light undergoes, in its qualities, or in its duration, when passing through bodies of different kinds and shapes, when reflected from their surfaces, or when moving past them at short distances. For an account of the nature and more general properties of light, see the article under that word.

History.—The ancients seem to have been very early acquainted with metallic mirrors, and we find burning glasses mentioned in the Comedy of the Clouds, by Aristophanes, which was enacted during the fifth century before the Christian era. Pythagoras and Empedocles, who flourished in the same century, both speculated on the theory of vision; the former maintaining, that objects become visible in consequence of particles, from the luminous objects, entering the pupil of the eye: the latter, on the other hand, asserted, that objects become visible by means of particles emitted from the eye, and striking them. It is not a little remarkable that Plato, who flourished about a century after, held the same opinion as Empedocles. The Platonic philosophers, however, taught two important laws in optics, *i. e.*, that light, from whatever source it may issue, is propagated in straight lines, and also, that the angle of incidence is equal to the angle of reflection. Aristotle observed, pretty accurately, the phenomena of halos, parhelia, and the rainbow. Archimedes destroyed the Roman fleet by fire, from the collected influence of the sun's rays reflected from a great number of plane mirrors. The first writer on optics on record, was the illustrious geometer, Euclid, who flourished about the year 300 B. C.; but, though from the hand of so great a man, the work contains much false reasoning. Seneca, about the middle of the first century of the Christian era, observed the effect of a glass-bottle filled with water, in magnifying objects, and also the effect of prisms in colouring objects seen through them. He also observed the magnifying power of concave mirrors. Claudius Ptolemy, the celebrated astronomer of Alexandria, was the greatest optician of the ancients. He lived about the middle of the second century, and two copies of his work still exist,—one in the Bodleian library at Oxford, the other in the Royal library at Paris. In this work, he treats of the theory of vision, or the refraction and reflection of light, of mirrors and lenses; and he treated the theory of astronomical refraction with more justice than any other astronomer before the time of Cassini. Nothing more was done by way of advancing optical science until the beginning of the tenth century, when one Al Farabius, an Arabian, produced a work on Perspective; but the only Arabian optician, whose work has come down to us, is that of Alhazen, who lived about the end of the eleventh century. In his work, he gives a very lucid account of the theory of vision, and a description of the eye; investigates the properties of seven different forms of mirror, and derives theorems for determining the relative distances of the object, image, and eye. In 1270, one Vitello, a Pole, drew up an elaborate work on optics, in which he arranged the results of the labours of his predecessors in a methodical order, and added much that was new of his own. Roger Bacon, who lived during the greater part of the thirteenth century, treats largely of optics in his *Opus Mâjus*, where he clearly describes spectacles and the single microscope, and has, by several historians, been considered as the inventor of these, as well as the telescope. Muschenbroek states, that it is inscribed on the tomb of Salvinus Armatus, a Florentine nobleman, who died in 1317, that he was the inventor of spectacles. Considerable additions were made to the science of optics by Maurolycus of Messina, who published a work in 1525, under the title of *Theoremata de lumine et umbra*, which contains many original and profound investigations of the theory of light. To the contemporary of Maurolycus, John Baptista Porta, we are, in all likelihood, indebted for the invention of the camera obscura, and some also claim for him the invention of the telescope, which last honour is also claimed for Roger Bacon, and for Thomas Digges, by his son Leonard, who published a work entitled *Pantometria*, (London, 1571), claiming with great plausibility the honour of the invention to his father. The invention of the telescope is ascribed by Descartes to James Metius, a citizen of Alkmaer, in Holland, about the year 1600. Strong evidence has been given that telescopes were made in 1609, by Zaharius Jansen of Middleburg. Early in the seventeenth century, M. A. de Dominis, archbishop of Spalatra, by a happy experiment with a glass globe, discovered the true theory of the rainbow, that it was produced by one reflection and two refractions. Galileo, without any knowledge of the construction of the telescope of Jansen, formed one for himself at Padua, in 1609, and constructed instruments of the form which generally goes by his name, *i. e.* those composed of a convex object glass and concave eyeglass, which had a magnifying power of 1000 times. The illustrious Kepler, in a work published in 1611, explained the theory of the telescope, and proposed the employment of one or more convex eyeglasses, a proposition which was first duly appreciated and put in practice by Father Sheiner; and Father Reitz effected a still farther improvement by employing an eye piece composed of three or four convex lenses, and is in fact the inventor of the common refracting telescope. The doctrine of refraction was investigated by Kepler, and from his experiments he obtained many important results; he also discovered many of the theorems for the determination of the foci of lenses, and his reasonings on the theory of vision are remarkable in the history of optics for their profoundness and accuracy. From the striking facts elicited by the experiments of Kepler, it is remarkable that the law of refraction escaped his penetrating mind; the honour of the discovery of this law was reserved for professor Snellius of Leyden. The law of refraction is that the sine of the angle of incidence bears to the sine of the angle of refraction a constant ratio in the same media. To Descartes, who flourished during the first half of the seventeenth century, much is due for his contributions to optical science. Descartes showed that since the spherical form of lenses failed to concentrate the rays in one point, we must look for a perfect lens in one whose curve is one of the conic sections; and he, therefore, proposed the employment of hyperbolic and elliptical lenses in the construction of telescopes. Such lenses never have been formed, and it is more than likely never will; nor is it at all probable that the reflecting telescope has derived any advantage from the multifarious attempts that have been made to give the speculæ a parabolic form. The mechanical operations necessary to produce such curves seem utterly impracticable; and even if they could be produced in lenses, they would only destroy the caustic curve, but would not compensate for the far greater evil, the different refrangibility of the rays of light. To Descartes is due the honour of first explaining the true theory of the rainbow, and accounting satisfactorily for the formation of the double bow. It is lamentable to think that the brilliant genius of this great man is tarnished with the want of ingenuousness; that the historian of science must have it to tell that in more than one instance he passed over in silence the discoveries of his predecessors, and even condescended to appropriate them as his own. About the same period, or a little later, a remarkable discovery was made by Erasmus Bartholinus, a Dane, who, having obtained some specimens of Iceland spar, observed the remarkable phenomena of double refraction which they exhibit. In these crystals he remarked that a double image is formed, in one of which the light follows the ordinary law of refraction, while in the other it follows an extraordinary law: (an account of his experiments will be found in the 67th No. of the Philosophical Transactions.) His experiments were carefully repeated and extended by the illustrious Huygens, who had the honour of discovering the polarization of light. To the same philosopher is due the promulgation of the undulatory theory, which was afterwards embraced by Euler, Dr Young, and most of the continental philosophers, and which has now obtained so much ground among men of science in this country as to threaten the speedy overturn of the Newtonian theory of emission. Huygens employed himself with success in the practical department of optics, and constructed telescopes, some of which were 136 feet in length. James Gregory invented the reflecting telescope, which he describes in his *Optica Promota*, published in 1663, (see his life in Chambers' Biography); but he never lived to see his invention put into operation. This was soon followed by the reflecting telescopes of Newton and Cassegrain. Gregory discovered the law of refraction in the improved form in which we now have it, and made many very accurate experiments on the refractive power of different substances; so accurate, indeed, were those experiments, that his index for water is not more than $\frac{1}{18000}$ in error. About the same time Grimaldi discovered the inflection of light, and Hook made nearly the same discovery, without knowing what had been done by Grimaldi. In the year 1676, the Danish philosopher, Roemur, from observations on the eclipses of Jupiter's satellites, made the important discovery of the motion of light, and proved that it travels over the diameter of the earth's orbit, a distance of 190,000,000 of miles in eleven minutes of time. Several important contributions were about the same time made to optical science by Tachrinhausen and Petit, more particularly as regards the investigation of caustic curves, and the structure of the eye. The greatest additions ever yet made to the science of optics were those contributed by the illustrious Newton. In 1664, when in the twenty-fourth year of his age, he commenced that brilliant series of experiments on colours, which led him to the important discovery of the different refrangibility of the rays of light. It would be impossible, in this brief view of the history of optics, to enter even into a catalogue of his discoveries in colours and the inflection of light. These are all detailed at full length in his Treatise on Optics, one of the finest works on experimental philosophy ever composed. The more important of these discoveries will be given in a subsequent section of this article. Although Huygens made experiments illustrative of the polarity of light, yet it was Newton who first suggested the idea that light had polarity.

After the discoveries of Newton, the next on record, of any importance, is that of the aberration of light, by Dr Bradley. Since the motion of light is such, that a particle of it traverses the diameter of the earth's orbit in eleven minutes, and that, during that time, the earth must have moved through a part of its orbit, it is plain that a ray of light, from a celestial body, will have reached the eye of the observer, after the object and the observer have changed places, from the instant in which the ray was emitted from the object. This is what is called the aberration of light. The invention of the achromatic telescope has been claimed for Euler and Klingensticorus; but there can be no doubt that the invention is of British origin, and that it is due to Dolland, who died in 1761, at the age of fifty-five. Euler embraced the undulatory theory of Huygens, with this addition, that he supposed the differences of colour to depend upon the differences of the rapidity of vibrations. Claraut investigated, with great ability, the theory of the achromatic telescope, in which he was followed with great success by d'Alembert, and also by the celebrated Boscovich. About 1760, Bouguer made numerous experiments, with a view to ascertain the intensity of the light emitted by different objects, and the quantity of light lost by refraction and reflection; in which interesting inquiries he was followed by that ingenious German philosopher, Lambert. Sir William Herschel commenced the construction of reflecting telescopes about the middle of last century, and erected them of greater dimensions than had ever been done before. In 1781, he constructed one of thirty feet in focal length of the great mirror; and, in 1783, he began the construction of his great telescope of forty feet, the diameter of the great speculum being four feet. Subsequent to this, he investigated the solar prismatic spectrum, and made many important discoveries. About the year 1790, Dr Blair made many valuable experiments, with a view to determine the refractive and dispersive power of various substances; and proposed the employment of fluids in the construction of achromatic telescopes. About the same time, Dr Thomas Young began to labour in the advancement of optical science. He directed his attention to the mechanism of the eye; and the results of his observations are highly valuable. He invented the optometer, an instrument for ascertaining the quantity of defect in eyes, either long or short-sighted, and, consequently, for determining the exact remedy to be adopted, in order to procure distinct vision. He also applied himself to the phenomena of colours, and of the law of interference; which last, indeed, he discovered. Dr Young adopted the undulatory theory, and applied it with the utmost perspicuity in the explanation of phenomena. Dr Ritter, of Jena, was the first who directed his attention to the chemical action of the rays of the prismatic spectrum. Dr Wollaston furnished a paper to the Transactions of the Royal society, in 1800, On double Images formed by Atmospheric Refraction; and, two years afterwards, another, exhibiting A Method of Examining Refractive and Dispersive Powers, by Prismatic Reflection. It was the same philosopher who showed that the best form for the glasses of spectacles is the meniscus, with the concave side nearest the eye. He also invented the camera lucida (q. v.). Malus, shortly after his return from the Egyptian campaign, entered vigorously upon the study of optics, and discovered the polarization of light by reflection; a most important event in the history of experimental philosophy. He found that all bodies polarize light; but that this is a maximum, at a certain angle, which is different in different bodies. The early death of Malus put a check to his brilliant career, and deprived the science of one of its bright-

Fig. 1.



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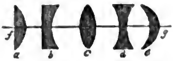

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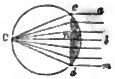

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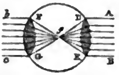

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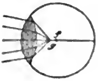

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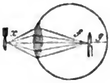

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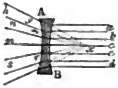

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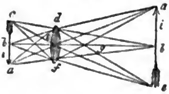

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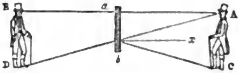

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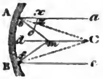

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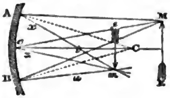

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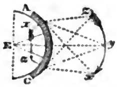

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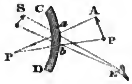

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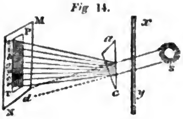

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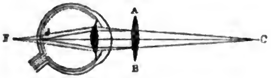

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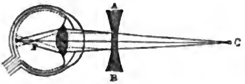
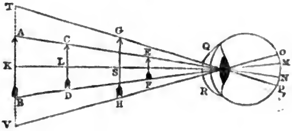


Fig. 17.



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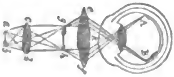


est ornaments. His labours were, however, followed up by the researches of M. Arago and M. Biot, and, at a more recent date, by Sir David Brewster. This last mentioned philosopher, whose discoveries have enriched various departments of the science, directed his attention to the effect of heat and compression on polarization, and on the relation which the chemical composition of bodies bears to their optical properties. He also conducted many experiments, with a view of determining the refractive powers of substances, and obtained many valuable results, particularly with regard to the gases. He invented several instruments, among which may be more particularly mentioned the kaleidoscope. The science is much indebted also to the labours of M. M. Fregnel, Fraunhofer, Berard, Dr Morchini, Sir J. W. Herschel, and others, who are still labouring in the field of discovery. Our limits will not admit of a more extended view of the history of optics. More minute particulars will be found detailed in the dissertation by Dr Thomson, accompanying this Encyclopedia.

Definitions.—By a *ray of light* is meant the motion of a single particle; and its motion is represented by a straight line. Any parcel of rays, passing from a point, is called a *pencil* of rays. By a *medium* is meant any pellucid or transparent body, which suffers light to pass through it; thus water, air, and glass, are called *media*. *Parallel rays* are such as move always at the same distance from each other. If rays continually recede from each other, they are said to *diverge;* if they continually approach towards each other, they are said to *converge*. The point at which converging rays meet is called the *focus;* the point towards which they tend, but which they are prevented from coming to, by some obstacle, is called the *imaginary focus*. When rays, after passing through one medium, on entering another medium, of different density, are bent out of their former course, and made to change their direction, they are said to be *refracted;* when they strike against a surface, and are sent back again from the surface, they are said to be *reflected*. A *lens* is glass ground into such a form as to collect or disperse the rays of light which pass through it. These are of different shapes, and from thence receive different names: a *plano-convex* lens has one side flat, and the other convex; a *plano-concave* lens is flat on one side, and concave on the other; a *double convex* lens is convex on both sides; a *double concave* lens is concave on both sides; a *meniscus* is convex on one side, and concave on the other. A line passing through the centre of a lens is called its *axis*.

Of Refraction.—Although a ray of light will always move in the same straight line, when it is not interrupted, yet every person knows, that when light falls upon a drop of water, or a piece of glass, or a bottle containing any fluid which allows the light to pass, it does not reach the eye, or illuminate a piece of paper placed behind those bodies, in the same manner as before they were put in its way. This obviously arises from the direction of the light being changed, by some power which resides in the bodies. The explanation of the law, or rule, by which this change in the direction of a ray takes place, constitutes that part of the science of optics called *dioptrics*, from two Greek words, one of which signifies *through*, and the other *to see*, because the bodies which produce this change are those through which we can *see*, or through which light passes. If the rays of light, after passing through a medium, enter another of a different density, perpendicular to its surface, they proceed through this medium in their original direction. But if they enter obliquely to the surface of a medium, either denser or rarer than what they moved in before, they are made to change their direction in passing through that medium. If the medium they enter be denser, they move through it in a direction nearer to the perpendicular drawn to its surface. On the contrary, when light passes out of a denser into a rarer medium, it moves in a direction farther from the perpendicular. This refraction is greater or less, that is, the rays are more or less bent, or turned aside from their course, as the second medium through which they pass is more or less dense than the first. To prove this in a satisfactory way, take an upright empty vessel into a darkened room, which admits but a single beam of light obliquely through a hole in a window shutter. Let the empty vessel stand on the floor, a few feet in advance of the window which admits the light, and let it be so arranged, that as the beam of light descends towards the floor, it just passes over the top of the side of the vessel next the window, and strikes the bottom on the side farthest from the window. Let the spot where it falls be marked. Now, on filling the vessel with water, the ray, instead of striking the original spot, will fall considerably nearer the side towards the window. And if we add a quantity of salt to the vessel of water, so as to form a dense solution, the point where the ray strikes the bottom will move still nearer to the window. In like manner, if we draw off the salt water, and supply its place with alcohol, the beam of light will be still more highly refracted; and oil will refract yet more than alcohol. In these experiments, if the room be filled with dust, the rays will be rendered much more visible.

Thus in fig. 1. plate LXIV. let A be the hole in the window shutter admitting the ray of light, A C, which falls obliquely upon the surface of the water in the vessel, a section of which is marked by the dark part of the figure. Were the vessel empty, then the ray of light A C would proceed onwards in the straight line A C B, and fall on the side of the vessel at the point B. But when the vessel is filled with water up to the level of C, the ray of light A C will, on the moment of its entering the water, be bended or refracted out of its original course, and proceed in the direction C H, falling on the side of the vessel at the point H, lower down than when the vessel was empty. The line D C E is perpendicular to the surface of the water in the vessel, so that, as said above, the ray passing out of the rarer medium, the air, into the denser, the water, is refracted near to the perpendicular. Again, if a bright object, such as a silver coin, be placed in the vessel of water at H, a ray of light proceeding from it will proceed first in the direction H C, but having arrived at the surface of the water, it will, on entering the rarer medium, the air, take the direction C A, more inclined from the perpendicular. By moving the coin farther up to the point B, the ray will proceed in the direction B C, but, after passing into the air, will take a direction farther from the perpendicular than the line B C A, and arrive at the circumference of the circle somewhere below the point A, so that the angle of incidence increases and decreases, as the angle of refraction increases or decreases, but not in equal proportion. But if we measure the lines A F and H O, which are the sines of these angles, we shall find that they bear a constant proportion, whatever be the angle. Thus, if the ray pass out of water into air, as we have supposed, and the line H O be measured, as also the line A F, then H O will be to A F as 1 is to 1·33, whatever be the angle; if the dense medium be glass, instead of water, then H O will be to A F in the constant proportion of 1 to 1·5, whatever be the angle. Now, the sine of the angle of incidence being always regarded as one, the relative refractive powers of water and glass will be as the number 1·33 to 1·5, and a table of such numbers showing the lengths of the sines of the angle of incidence, the length of the sine of the angle of refraction, being always regarded as one, is called a table of refractive powers, and the numbers 1·33, 1·5, &c., are denominated the indices of refraction. The following is a specimen of such tables:—

Substance.	*Index of Refraction.*
Chromate of lead	2·974
Diamond	2·755
Phosphorus	2·224
Glass (lead 3 flint 1)	2·028
(lead 2, sand 1)	1·987
Flint glass	1·605
Copal	1·549
Crown glass	1·525
Dutch plate glass	1·517
Oil of turpentine	1·475
Sulphuric acid	1·440
Alcohol	1·37
Water	1·33

Although, in most cases, there is a connexion between the refractive power and the density of bodies, yet refraction does not invariably increase with their density. In the case of oily substances and inflammable bodies, such as hydrogen, phosphorus, sulphur, diamond, bees' wax, amber, spirit of turpentine, linseed oil, olive oil, camphor, their refractive powers are from two to seven times greater, in respect to their density, than those of most other substances. Sir Isaac Newton observed this fact with respect to the last five substances, which, he says, are "fat, sulphureous, unctuous bodies," and, as he observed the same high refractive power in the diamond, he inferred that it was probably an unctuous substance coagulated. This law, however, at one time, seemed to be overturned by an observation of doctor Wollaston, that phosphorus, one of the most inflammable substances in nature, had a very low refractive power; but doctor Brewster, confiding in the truth of the law, examined the refractive power of phosphorus by forming it into prisms and lenses, and he found it to be nearly as high as diamond, and fully twice that of diamond compared with its density—an observation which re-established and extended the general principle respecting the refractive power of inflammable substances. In fig. 2 we have represented side sections of the most common kinds of lenses, or optical glasses. *f f* is a line drawn through their centre; *a* represents a *plano-convex* lens, being plane on the one side and convex on the other; *b* is a *plano-concave*, being plane on the one side and concave on the other; *c* is a double convex lens, or convex on both sides; *d* is a double concave lens, or one with two concave sides; *e* is a *concavo-convex* or *meniscus* lens, being concave on the one side and convex on the other. We now proceed to show the action of these lenses in refracting light, and first we shall explain the effect of the plano-convex lens.

In fig. 3 we have represented a plano-convex lens with the parallel rays *a c*, *b n*, *m d*, falling upon its convex surface. Now, not one of those rays, excepting the middle one *b n*, falls perpendicularly upon the surface of the glass, but that ray will pass directly on in the straight line *b n* C without changing its course. The rays *a c* and *m d* fall obliquely, and will therefore be refracted in contrary directions, and meet in the point C. So will all the other rays, excepting the middle one, which never deviates from its original course, but meets them in the point C. The point C, at which the rays meet, can be shown both by geometry and experiment, to be in the circumference of the circle of which the curvature of the lens forms a part. The point C is called the focus of the lens. Had the other side been also curved, the effect of refraction would have been still greater, for then the rays would have passed out of the glass more obliquely than if it had been plane. In fig. 4 we have shown two convex glasses. Suppose the parallel rays A B, fig. 4, fall upon the lens D E, which is doubly convex, they will be converged into the focus *f*, which is situated in the centre of the circle, whose radius is the same as that of the curves of the surfaces. The same holds of the lens F G, upon which the parallel rays *b c* fall. We are supposing that the surfaces of the lens are of equal curvature, but when they are not, the distance of the focus from the centre of the circle will be found by using this simple proportion—as the sum of the radii of both curves is to the radius of either, so is double the radius of the other to the distance of the focus from the middle point; thus, if the one radius be 4 and the other 3 inches, then $3 + 4 = 7$ and $7 : 4 :: 6 : 3\frac{3}{7}$ inches. These remarks, respecting the place of the focus, only hold true when the rays which fall on the lens are parallel; when they are not, the place of the focus will be nearer to or farther from the lens, according as the rays are convergent or divergent before they reach the surface of the glass. Thus, in fig. 5, the rays before they reach the lens are convergent, and would meet in a point on the other side of the lens, even if it were not interposed; but the effect of the lens is to converge the rays, and this added to the natural convergence, which they possess before they reach the lens, will cause them to converge sooner after they pass through it, than if they had been parallel; so that, instead of meeting in the point *f*, which is the centre of the circle of curvature, and which would have been the focus had the rays been previously parallel, they meet in the point *g* nearer to the lens, which point is therefore the focus. On the other hand, if the rays proceed from an object *x* which is near the lens, and diverge before they meet it, this divergence will partly destroy the converging power of the lens, and the rays will not meet so soon after passing through it as if they had been previously parallel; they will meet in a point *g*, fig. 6, beyond the centre of curvature *f* of the lens. Where the rays meet, or in the focus of the convex lens, they form an inverted image of any object, the rays of light proceeding from which pass through it, for at that point the rays cross each other. Let *a b c*, fig. 7, represent an arrow placed in the front, and beyond the focus *g* of a double convex lens *d e f*, some rays will flow from every point of the arrow, and fall upon the lens: but we shall regard only those which flow from the ends *a* and *c*, and the middle point *b*. From the point *a* the rays *a d*, *a e*, and *a f* issue, and will be refracted by the lens, and meet in A. The rays which come from the middle point *b* will diverge, and passing through the lens will meet in the point C, and the rays which are emitted from *c* will be converged into the point D at the top of the image which is formed in the focus of the lens. This may be easily proved by experiment. Hold a convex lens at a distance from the window, and place behind it a piece of paper, exactly in the focus, it will be found that a distinct image of the window and the objects beyond it will be formed on the paper, but the image will be inverted, or the houses and trees will appear at the top instead of the bottom.

The action of a concave lens on rays of light is quite different from that of a convex. If parallel rays fall upon a concave lens, they will diverge after refraction, and continue to deviate farther from one another the farther they proceed. The form of the concave lens being the reverse of the convex, its effect may easily be conceived to be the reverse. In fig. 8, A B represents a concave lens with parallel rays entering it from the points *a b c*, &c.; these rays will, after passing through it, diverge in the directions

$h\ n\ m\ z$, &c. Thus the ray a, after being refracted, will go on in the direction $g\ h$, and the d will go on in the opposite direction $r\ z$, and so of the rest. If all these rays $g\ h$, $r\ z$, &c., were traced back to the point, where, if they continued the same direction, they would meet, that point would be found in x, which is the centre of the circle which is of the same curvature as the lens. This point x is called the *virtual*, or *imaginary* focus. The imaginary focus of a concave lens is analogous in distance to the focus of a convex lens, for when the lens is double concave, then the focus is in the centre of the circle; when it is plano-concave it is double that distance, or in the circumference when the rays are parallel. When the rays diverge before they meet the lens, then this will add to the divergence after refraction, and the imaginary focus will be nearer to the lens than the centre of curvature; on the other hand, if the rays before refraction be convergent, then will the divergence after refraction be so much less, and the focus proportionally more distant.

It is of importance to determine the image formed by a lens, the radius of curvature being known, and also the distance of the object whose rays are refracted. Multiply the distance of the focus (for parallel rays) by the distance of the object, and divide by the difference of these two quantities, the quotient is the distance of the image from the lens; thus, if the focal distance of the lens be six inches, and the distance of the object twelve, then the distance of the image will be twelve inches, if the focus be the same, and the distance of the object eight, then the distance of the image is thirty-six inches.

Of Reflection.—When light falls upon a body, a portion of it is thrown back, or reflected from its surface, according to a regular law, the explanation of which constitutes that branch of optics called *catoptrics*, a word derived from two Greek words, one of which signifies *from*, or *against*, and the other *to see*, because things are seen by light reflected from bodies. When a ray of light falls upon any body, it is reflected so that the angle of incidence is equal to the angle of reflection; and this is the fundamental fact upon which all the properties of mirrors depend. Let a ray of light, passing through a small hole into a dark room, be reflected from a plane mirror; at equal distances from the point of reflection, the incident and the reflected ray will be at the same height from the surface. The same is found to hold in all cases, when the rays are reflected at a curved surface, whether it be convex or concave. The rays which proceed from any remote terrestrial object, are nearly parallel at the mirror; not strictly so, but come diverging to it in several pencils, or, as it were, bundles of rays, from each point of the side of the object next the mirror; therefore they will not be converged to a point at the distance of half the radius of the mirror's concavity from its reflecting surface, but in separate points, at a greater distance from the mirror. And the nearer the object is to the mirror, the farther these points will be from it; and an inverted image of the object will be formed in it, which will seem to hang pendent in the air, and will be seen by an eye placed beyond it (with regard to the mirror), in all respects like the object, and as distinct as the object itself. If a man place himself before a large concave mirror, but farther from it than the centre of its concavity, he will see an inverted image of himself in the air, between him and the mirror, of a less size than himself; and if he hold out his hand towards the mirror, the hand of the image will come out towards his hand, and coincide with it, of an equal bulk, when his hand is in the centre of concavity, and he will imagine that he may shake hands with his image. If he reach his hand farther, the hand of the image will pass by his hand, and come between it and his body; and if he move his hand towards either side, the hand of the image will move towards the other; so that, whatever way the object moves, the image will move the contrary way. A bystander will see nothing of the image, because none of the reflected rays that form it enter his eyes. The images formed by convex specula are in positions similar to those of their objects; and those also formed by concave specula, when the object is between the surface and the principal focus: in these cases the image is only imaginary, as the reflected rays never come to the foci, from whence they seem to radiate. In all other cases of reflection from concave specula, the images are in positions contrary to those of their objects; and these images are real, for the rays, after reflection, do come to their respective foci.

These observations will be more clearly understood by reference to diagrams. That the angle of incidence is equal to the angle of reflection is proved by the fact, that in order to show the image of the body reflected from a plane mirror, it is only necessary that the mirror should be half the length of the body. Let $a\ b$, fig. 9, be a plane mirror, and let A be a spectator looking at the reflection of his own person. The ray A a, from the eye, will be reflected back in the same direction, for in this case it strikes the mirror at right angles to its surface; but the ray C b, from the foot, impinges upon the mirror obliquely at b, and is reflected in the direction b A, the line C b, the line of incidence, forming an equal angle with the line $b\ x$, that the line of reflection, b A, does. The spectator will see his image as if it were at E D. The fact of the angle of incidence being equal to the angle of reflection, affords an easy method of measuring the heights of objects. Lay a mirror upon the ground, and looking at the mirror, walk back until the image of the top of the object is seen reflected by the mirror, then use this proportion: As the distance of the foot from the mirror is to the height of the eye above the ground, so is the distance of the mirror from the bottom of the object to the height of the object. The law of reflection, we have been considering, holds equally true if the mirror be curved, *i. e.*, the angle of incidence is always equal to the angle of reflection. Thus, in a concave mirror, A B, fig. 10, let a b, C d e, f, be parallel rays from some distant object, these rays will be reflected so as to meet in the point C, which is the centre of curvature of the mirror; and this must of necessity be their course, for if the mirror be supposed to be made up of a great many little planes, it would be found, by making the angles of incidence and reflection equal, that all the rays would meet in the central point C, which is called the focus of the mirror. An image of the object will be formed at the point C, in the same manner as would be done in the focus of a convex lens. When the incident rays are not parallel, the point of convergence will not be in the point C, the centre of curvature; for let rays from the arrow, M E, fig. 11, fall upon the mirror A B, which is concave like the former, the rays will flow from every point of the arrow, as M, to every point in the surface of the mirror. Take the rays that flow from M to the points A, C, and B. These rays diverge before they come to the mirror, which divergence will partly destroy the convergence after reflection, and consequently the rays will not meet in C, the centre of curvature, but at a point more remote; they will meet in points, and form an inverted image of the arrow at $l\ m$. To find the distance of the image, the distance of the object and radius of curvature being given, multiply the object's distance by the radius, and divide the product by thrice the distance, minus the radius, the quotient is the distance of the image. The image, by reflection from a concave mirror, is always before it when the object is farther distant than the centre of curvature; but when it is nearer the image, is behind the mirror. Let A C, fig. 12, be a concave mirror, of which the centre of curvature is K. Let rays fall upon it from the arrow, x z, which is nearer to the mirror than the centre K. The image will appear as if at x y z, behind the mirror, erect, curved, and magnified. A convex mirror has the same effect upon the rays of light as a concave lens; it causes them to diverge. Let C D, fig. 13, be a convex mirror, and let rays fall upon it from an arrow, A P, the rays A a, and P b, fall upon it converging, and it will be reflected convergingly in the direction, a E, b E, and the image will appear as if situated at S, behind the mirror.

Colours.—The origin of colours is owing to the composition which takes place in the rays of light, each heterogeneous ray consisting of innumerable rays of different colours: this is evident from the separation that ensues in the well known experiment of the prism. That branch of optics which treats of the colours of light, of their physical properties, and of the laws according to which light is decomposed, and recomposed from its elements, is called *chromatics*, from a Greek word signifying *colour*. A ray being let into a darkened room, through a small aperture, and falling on a triangular glass prism, is, by the refraction of the prism, considerably dilated, and will exhibit, on the opposite wall, an oblong image, called a *spectrum*, variously coloured, the extremities of which are bounded by semicircles, and the sides are rectilinear. The colours are seven in number, which, however, have various shades, gradually intermixing at their juncture. Their order, beginning from the side of the refracting angle of the prism, is red, orange, yellow, green, blue, purple, violet. The obvious conclusion from this experiment is, that the several component parts of solar light have different degrees of refrangibility, and that each subsequent ray, in the order above mentioned, is more refrangible than the preceding. Their different degrees of refrangibility may be proved by admitting rays of red, orange, yellow, green, blue, indigo, and violet light, through a small aperture, into a darkened room, prepared as in the experiment for showing the refractive power of water, alcohol, &c., above described. We shall find that each colour has a different refractive power of its own, that of the red being the least, and that of the violet the greatest. The following table exhibits the result of such an experiment with water:

Red,	1·3310
Orange,	1·3317
Yellow,	1·3336
Green,	1·3358
Blue,	1·3378
Indigo,	1·3413
Violet,	1·3442

Either of these rays, on being made to traverse another prism, remains unalterable; they are, therefore, all regarded as permanent, and each one distinct from the other. This opinion is heightened by the fact, that they undergo no manner of change by reflection; for if any coloured body be placed in simplified, homogeneous light, it will always appear of the same colour as the light in which it is placed. White is compounded of all the primary colours, mixed in their due proportion; for if a solar ray be separated, by the prism, into its components, and, at a proper distance, a lens be so placed as to collect the diverging rays again into a focus, a paper, placed perpendicularly to the rays in this point, will exhibit whiteness. The same conclusion may be drawn from mixing together paints of the same colour as the parts of the spectrum, and in the same proportion; the mixture will be white, though not of a resplendent whiteness, because the colours mixed are less bright than the primary ones: this may likewise be proved by fixing pieces of cloth, of all the seven different colours, on the rim of a wheel, and whirling it round with great velocity; it will appear to be white. Though seven different colours are distinguishable in the prismatic spectrum, yet, upon a closer examination, we shall see that there are, in fact, only three original colours—red, blue, yellow; for the orange, being situated between the red and yellow, is only the mixture of these two; the green, in like manner, arises from the blue and yellow; and the violet from the blue and red. As the colour of a body, therefore, proceeds from a certain combination of the primary rays which it reflects, the combination of rays flowing from any point of an object will, when collected by a glass, exhibit the same compound colour in the corresponding point of the image. Hence appears the reason why the images, formed by glasses, have the colours of the object which they represent. When a prism of solid glass is employed for separating the rays of light, the lengths of the colours are expressed as follows: red, forty-five; orange, twenty-seven; yellow, forty; green, sixty; blue, sixty; indigo, forty-eight; violet, eighty, or 360 in all. But these spaces vary with prisms of different substances, and as they are not separated by distinct limits, but shade gradually into one another, it is almost impossible to obtain any thing like an accurate measure of their relative extents.

The experiment with the prism will be more clearly comprehended by a reference to the diagram, fig. 14. Let a pencil of rays from the sun S enter a darkened room through a hole in the window; shut x y, the natural course is along the line d; but a glass prism a c is interposed, which will refract the whole pencil upwards, and it will be dispersed in divergent lines, forming the spectrum M n on a white wall behind the prism. From the different refrangibility of the rays of light, the red rays, which are least refrangible, will occupy one portion of the spectrum; and the violet, which are the most refrangible, another; or the other colours will occupy their respective places between these, according to their degree of refrangibility. These are the colours of the rainbow, and when we come to speak of natural phenomena, we shall show how it is produced.

Vision.—Objects presented to the eye have their images painted on the back part of the retina, the rays of the incident pencils converging to their proper foci there, by the refraction of the different humours, for which purpose they are admirably adapted; for, as the distance between the back and front of the eye is very small, and the rays of each of the pencils that form the image fall parallel, or else diverging, on the eye, a strong refractive power is necessary for bringing them to their foci at the retina; but each of the humours, by its peculiar form and density, contributes to cause a convergence of the rays; the aqueous, from its convex form; the crystalline, by its double convexity and greater density than the aqueous; and the vitreous, by a less density than the crystalline, joined to its concave form. The structure of the eyes is, in general, adapted to the reception of parallel rays; but, as the distances of visible objects are various, so the eye has powers of accommodating itself to rays proceeding from different distances, by altering the distances of the crystalline from the retina, which is done by the action of the ciliary ligaments. Defective sight arises from an incapacity of altering the position of the crystalline within the usual limits: 1. when it cannot be brought close enough to the cornea, near objects appear indistinct; to this defect people in years are generally subject; 2. when the crystalline cannot be drawn sufficiently near to the retina, remote objects appear indistinct; this is the defect under which short-sighted people labour. In each of these cases, the images of the different points in the object would be diffused over small circles on the retina, and so, being intermixed and confounded with each other, would then form a very confused picture of the object. For, in the former case, the image of any point would be formed behind the retina, as the refraction of the eye is not sufficiently strong to bring the rays (diverging so much as they do in proceeding from a near point) to a focus at the retina. This defect will therefore be remedied by a convex glass, which makes the point whence the rays now proceed more distant than the object; therefore the rays, falling on the eye, will now diverge less than before, or else be parallel, and will, of course, be brought to a nearer focus, viz., at the retina. In the latter case, the image is formed before the retina, because the refractive power of the eye is too great to permit rays so little diverging (as they do in proceeding from a distant point) to reach the retina, before they are collected into a focus: in this case, the defect is supplied by a concave glass, which makes the point whence the rays diverge nearer than the object; consequently, the rays falling on the eye will now diverge more than before, so as, when refracted through the humours, not to come to their focus before they reach the retina. Therefore spectacles are constructed concave for short-sighted, and convex for long-sighted people. And the frames of spectacles should be so bent that the axis of both glasses may be directed to the same point, at such a distance as you generally look with spectacles. By this means the eyes will fall perpendicularly upon both glasses, and make the object appear distinct; whereas, if they fall obliquely upon the glasses, the object will appear confused, and indistinct.

Cause of Squinting.—A person is said to *squint*, when both eyes do not seem to be directed to the object at which he is looking. When either of the eyes has a less perfect vision, or a different focal length, or when there is any weakness in its external muscles, we are apt to make use only of the good eye; and when we acquire the habit of doing this, the imperfect eye is left at rest, and will sometimes cease even to follow the movements of the other. If the good eye is shut, and the bad one forced to exert itself, the iris will be placed symmetrically between the eyelids, and the squint formerly seen in the eye will disappear. Should the eye, in this case, still squint, the cause of it must be sought either in the central hole of the retina not being at the extremity of the axis, or in some mal-conformation, by which the retina is not perpendicular to the axis of the eye, at the point where they meet. This disease of the eye, which is so generally neglected, might be frequently cured, even in adults, by those who are thoroughly acquainted with the structure and functions of this organ.

The structure of the eye has already been described in our article *Eye* (q. v.). In order that distinct vision should be effected, it is necessary that the rays from the luminous object should be converged in points upon the retina. When, from the little convexity in the crystalline lens, or any other cause, these rays are not converged upon the retina, but behind, indistinct vision will be the result. When this is the case, a convex lens is interposed between the object and the eye, to assist the humours in converging the rays sooner, so that they may meet on the retina. If the cornea C D, fig. 15, or the crystalline lens *a b*, or both, be too flat, so as not to converge the rays from the object *x*, until they arrive at the point *z*, which is behind the retina, a convex lens, *m n*, is interposed to increase the convergence, and cause the rays to meet on the retina at *r*. Hence the necessity of convex spectacles for persons, with flat corneæ, or crystalline lenses. On the other hand, when these lenses are too much curved, they would cause the rays of light to meet before they reached the retina, and indistinct vision would follow. This defect will be remedied by the interposition of a concave lens, which will diminish the convergence of the rays, and cause them to meet in points which are on the retina. The degree of curvature of the lenses must obviously be adapted to compensate exactly for the defect or excess of the curvature of the cornea or crystalline lens. See fig. 16.

Accidental Colours.—One of the most curious affections of the eye is that which gives rise to ocular spectra, or accidental colours. If we place a red wafer on a sheet of white paper, and, closing one eye, keep the other directed for some time to the centre of the wafer, then, if we turn the same eye to another part of the paper, we shall see a green wafer, the colour of which will grow fainter and fainter as we continue to look at it. This green image of the wafer is called an *ocular spectrum*, or the accidental, or opposite colour of red. By using different coloured wafers, we obtain the following results:

Colour of the Wafer.	*Colour of the Spectrum.*
Black,	White.
White,	Black.
Red,	Bluish green.
Orange,	Blue.
Yellow,	Indigo.
Green,	Violet, with a little red.
Blue,	Orange red.
Indigo,	Orange yellow.
Violet,	Bluish green.

When a strong impression of white light is made upon the eye, a succession of remarkable spectra is visible. When the sun was near the horizon, M. Æpinus fixed his eye steadily upon it for fifteen seconds. Upon shutting his eye he saw an irregular, pale, greenish-yellow image of the sun, surrounded with a faint red border. When he opened his eye, and turned it to a white ground, the image of the sun was brownish-red, and its border sky-blue. With his eye again shut, the image appeared green, and the border a red, different from the last. On opening his eye, and turning it to a white ground, as before, the image was more red than formerly, and the border a brighter sky-blue. His eye being again shut, the image was green, approaching to sky-blue, and the border a red, still differing from the former. When his eye was again opened upon a white ground, the image was still red, and its border sky-blue, but with different shades from the last. At the end of four or five minutes, when his eye was shut, the image was a fine sky-blue, and the border a brilliant red; and, upon opening his eye, as formerly, upon a white ground, the image was a brilliant red, and the border a fine sky-blue. Experiments of a similar kind were made by doctor Brewster, by looking at a brilliant image of the sun's disk, formed by a concave mirror. With his right eye tied up, he viewed this luminous disk with the left, through a blackened tube, to prevent any extraneous light from falling upon the retina. When the retina was highly excited by this intense light, he turned his left eye to a white ground, and perceived the following spectra, by alternately opening and shutting his eye:—

Spectra with the left Eye open.	*Spectra with the left Eye shut.*
1. Pink, surrounded with green,	Green.
2. Orange, mixed with pink,	Blue.
3. Yellowish brown,	Bluish pink.
4. Yellow,	Lighter blue,
5. Pure red,	Sky-blue.
6. Orange,	Indigo.

These spectra were always surrounded with a ring of the accidental colour. If, when one of these spectra is visible, we press the eye to one side, the spectrum will appear to be absolutely immovable, if the experiment is not made with much attention. It will be found, however, by pressing both the eyes at once, and by due attention to their corresponding motions, that the spectrum does move, and that it is seen by the eye in the same manner as if it were the image of an external object, conformably to the law of visible direction. By means of pressure upon the eyeball, ocular spectra may be produced; and when spectra, produced by external impressions of light, are seen by the eye, their colours are changed by pressure on the eyeball. The pressure of the blood-vessels on the back of the eye often produces spectra, in particular states of the stomach. In slight affections, these spectra are floating masses of blue light, which appear and disappear in succession; but, in severe ones, they become green, and sometimes rise to yellow: hence it follows, that pressure upon the retina creates the sensation of light and colours.

Colours produced by the unequal Action of Light upon the Eyes.—If we hold a slip of white paper vertically, about a foot from the eye, and direct both eyes to an object at some distance beyond it, so as to see the slip of paper double, then, when a candle is brought near the right eye, so as to act strongly upon it, while the left eye is protected from its light, the left hand slip of paper will be of a tolerably bright green colour, while the right hand slip of paper, seen by the left eye, will be of a red colour. If the one image overlaps the other, the colour of the overlapping parts will be white, arising from a mixture of the complementary red and green. When equal candles are held equally near each eye, each of the images of the slip of paper is white. If, when the paper is seen red and green, by holding the candle to the right eye, we quickly take it to the left eye, we shall find that the left image of the slip of paper gradually changes from green to red, and the right one from red to green, both of them having the same tint during the time in which the change is going on. This experiment seems to confirm the observation of Dr Brewster, that in certain highly excited states of one eye, the reverse impression may be conveyed from the one eye to the other.

Insensibility of certain Eyes to particular Colours.—Various cases have been described, in which persons capable of performing the most delicate functions of vision are unable to distinguish particular colours, and, what is certainly a most remarkable fact, this imperfection runs in families. A shoemaker by the name of Harris, at Allonby in Cumberland, could only distinguish black and white. He was unable, when a child, to distinguish the cherries on a tree from the leaves, except by their shape and size. He had two brothers whose perception of colours was almost equally defective, one of whom constantly mistook orange for grass green, and light green for yellow. He had two other brothers and sisters, who, as well as his parents, had no such defect. Another case of a Mr Scott is described by himself in the Philadelphia Transactions for 1778. He did not know any green colour; a pink colour and a pale blue were perfectly alike to him. A full red and a full green were so alike, that he often thought them a good match; but yellows, light, dark, and middle, and all degrees of blue, except pale sky-blue, he knew perfectly well; and he could discern, with particular niceness, a deficiency in any of them. A full purple and a deep blue, however, sometimes baffled him. Mr Scott's father, his maternal uncle, and one of his sisters, and her two sons, had all the same defect. Mr Dugald Stewart, Mr Dalton, and Mr Troughton, are examples of the same inability to distinguish certain colours. Mr Harvey has described, in the Edinburgh Transactions, the case of a tailor, then alive, and aged sixty, who could distinguish with certainty only white, yellow, and gray. On one occasion, he repaired an article of dress with crimson in place of black silk; and, on another occasion, he patched the elbow of a blue coat with a piece of crimson cloth. He regarded indigo and prussian blue as black, purple as a modification of blue, while green puzzled him extremely. He considered carmine, lake, and crimson to be blue. The solar spectrum appeared to him to consist only of yellow and light blue. None of the family of this person had the same defect. In these various cases, the persons are insensible to red light, and all the colours into which it enters. Mr Dalton thinks it probable that the red light is, in these cases, absorbed by the vitreous humour, which he supposes may have a blue tint. If, which is probable, the choroid coat be essential to vision, we may ascribe the loss of red light in certain eyes to the retina itself having a blue tint. If the dissection of the eye of any person who possesses this peculiarity shall not establish either of these two suppositions, we must content ourselves with supposing that the retina is insensible to the colours at the end of the spectrum, just as the ear of certain persons has been proved by doctor Wollaston to be insensible to sounds at one extremity of the scale of musical notes, while it is perfectly sensible to all other sounds.

Optical Instruments.—The impediments to the vision of very near objects arise from too great a divergence of the rays in each pencil incident on the eye, and are remedied by the microscope. The most powerful single microscopes are very small globules of glass, which any person may make for himself, by melting the ends of fine threads of glass in the flame of a candle; or by taking a little fine powdered glass on the point of a very small needle, and melting it into a globule before a smooth blow-pipe. It was with such microscopes as these that Leuwenhoek made all his wonderful discoveries, most of which are deposited in the British museum. The double or compound microscope differs from the preceding in this respect—that it consists of at least two lenses, by one of which an image is formed within the tube of the microscope; and this image is viewed through the eyeglass instead of the object itself, as in the single microscope. In this respect, the principle is analogous to that of the telescope, only that, as the latter is intended to view distant objects, the object-lens is of a long focus, and consequently of a moderate magnifying power, and the eyeglass of a short focus, which magnifies considerably the image made by the object-lens; whereas, the microscope being intended only for minute objects, the object-lens is consequently of a short lens, and the eyeglass, in this case, is not of so high a magnifying power. The solar microscope is a kind of *camera obscura*, which, in a darkened chamber, throws the image on a wall or screen. It consists of two lenses fixed opposite a hole in a board or window-shutter—one which condenses the light of the sun upon the object (which is placed between them), and the other which forms the image. There is also a plain reflector placed without, moved by a wheel and pinion, which may be so regulated as to throw the sun's rays upon the outer lens. Mr Adam's most ingenious invention—the lucernal microscope—is also to be considered as a kind of *camera obscura*, only the light, in this latter case, proceeds from a lamp instead of from the sun, which renders it convenient to be used at all times. From what has been said on the nature of the microscope, the principle of the telescope may be

OPTICS—PERSPECTIVE. [PLATE LXV.

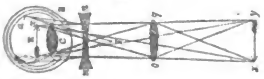


Fig. 19.

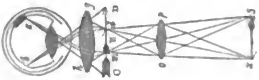


Fig. 20.

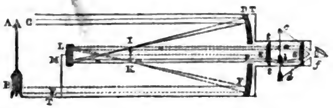


Fig. 21.

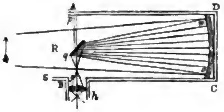


Fig. 22.

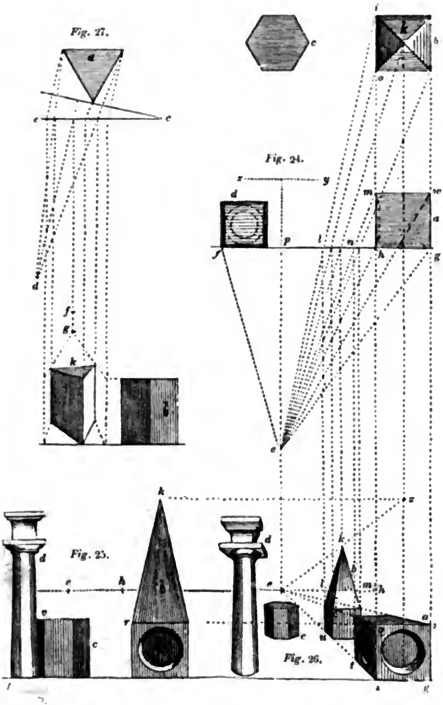


Fig. 27.

Fig. 24.

Fig. 25.

Fig. 26.

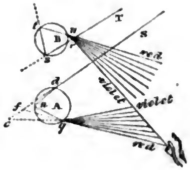


Fig. 23.

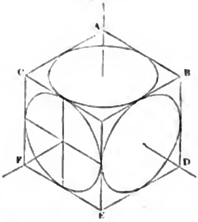


Fig. 28.

easily understood. Telescopes are of two kinds—the one depending on the principle of refraction, and called the *dioptric* telescope, the other on the principle of reflection, and therefore termed the *reflecting* telescope.

The great object in constructing a microscope or telescope, is to bring the image of the object as near to the eye as possible, so that it may be viewed under a much greater angle than it could be, were the instrument not interposed between the object and the observer. It is a law in vision, that an object will appear the larger in proportion to the magnitude of the angle formed by any two rays flowing from its opposite extremities; and the nearer the object is to the eye, the greater will be this angle. Thus, in fig. 17, let the arrow A B be placed at a given distance from the eye, the rays from its extremities will converge and enter the eye at Q R, they will be refracted by the humours of the eye, as described in a former section, and form an inverted image, M N, on the retina. That a smaller arrow, at C D (nearer the eye), and a still smaller arrow (still nearer), would form a similar image of the same magnitude, will readily be seen by an inspection of the figure. But if an arrow, G H, of the same magnitude as the arrow A B, were held nearer the eye than A B, it would appear larger, because the rays from its extremities form a greater angle. In the diagram, the arrow G H is placed at half the distance of the arrow A B; and the angle formed by its rays will be twice as large, and consequently the image on the retina twice as large. The image, O P, would appear to be formed by rays from an arrow, T V, double the length of A B, and at the same distance. The apparent length of an object will be diminished one half, by removing it to twice the original distance from the eye; to one third, at thrice the distance, &c.; and so will the breadth. Now, a surface, which is only one half as broad, and one half as long as another, is only one fourth the magnitude; if only one third of the length, and one third of the breadth, the magnitude will be but one ninth, &c.; so that the apparent size of objects is inversely as the squares of their distances; that is, if at sixteen feet distant, an object appear one square foot in magnitude, then at eight feet it will appear four; at four feet, sixteen; and at one foot, as if containing 256 feet.

By means of a convex lens, a great number of rays from any minute object are united in a sensible point; and as each ray carries with it the image of the point from whence it proceeded, a distinct image will be formed, provided the rays keep their proper relative positions; and thus it is that a single microscope removes the confusion of rays of an object, when viewed at a short distance from the eye, and thus enables it to examine the object under a greater angle of vision. In the compound microscope, there are essentially two lenses, and its chief superiority over the single microscope is, that by it we obtain a larger field of view. The small object, *a b*, fig. 18, is placed a little farther from the object-glass, *c d*, than its principal focus, or focus for parallel rays, so that an image may be formed at *g h*. This image is viewed by the eyeglass, *e f*, which is so placed that the eye and the image are in its respective foci on the opposite sides, in consequence of which, the rays enter the eye parallel to each other, after which they are converged upon the retina, and a very large image is formed.

Fig. 19, represents a very simple form of the refracting telescope, in which B represents the eye, *m n*, the eyeglass (double concave), and *o p* the object-glass, (double convex.) There are two pencils of rays proceeding from the arrow *x y;* those from *x* go on diverging till they come to the lens *o p*, and by the refraction of that lens they will be converged in the point E, and so of the rays from *y;* consequently an image will be formed at E; but the concave lens, *m n*, being interposed before they meet, prevents the convergence from occurring so soon, and throws the image upon the retina *a b*, where it is magnified. As the concave lens throws many of the rays beyond the pupil, the field of view is very small. By employing a double convex eyeglass this is remedied, as shown in fig. 20. The object-glass, *o p*, converges the rays from *x* and *y*, and forms an inverted image at *m* E *d*, and by interposing the lens *g h*, this image is seen under a large visual angle, so as to appear of the magnitude C E D. In this telescope the image is inverted, but corrected by interposing other convex lenses between the object and eyeglasses. Here two such lenses are introduced, each of the same focus as the first.

The great inconvenience attending refracting telescopes is their length, and on that account they are not very much used when high powers are required. A reflector of six feet long will magnify as much as a refractor of a hundred feet. In reflectors the concave mirror is substituted for the convex lens. T T, fig. 21, represents the large tube, and *t t* the small tube of the telescope, at one end of which is D F, a concave mirror, with a hole in the middle at P, the principal focus of which is at I K; opposite to the hole P is a small mirror L, concave towards the great one; it is fixed on a strong wire M, and may, by means of a long screw on the outside of the tube, be made to move backwards or forwards. A B is a remote object, from which rays will flow to the great mirror D F. And in order to trace the progress of the reflections and refractions, the upper ones are represented by full lines, the lower ones by dotted lines. Now the rays at C and E, falling upon the mirror at D and F, are reflected, and form an inverted image at *m*. And they go on towards the reflector L, the rays from different parts of the object crossing one another a little before they reach L. From the mirror L the rays are reflected nearly parallel through P; there they have to pass the plano-convex lens R, which causes them to converge at *a b*, and the image is now painted in the small tube near the eye. By means of the lens R, and the two concave mirrors, the image of the object is brought so nigh as at *a b*, is magnified by the lens S, and will appear as large as *c d*, that is, the image is seen under the angle *c f d*.

This telescope is of the Gregorian form; but for large instruments the Newtonian reflecting telescope is commonly preferred. A concave mirror, *n o*, fig. 22, is placed in the bottom of a tube, A, D, C, B, which also contains a plane mirror *q*, at an angle of 45°, and fixed upon the arm *p q*, and in the side of the tube there is an eyeglass, h. Rays from a distant object enter the tube, and fall upon the concave mirror *n o*, from whence they are reflected, converging upon the surface of the plane mirror *q*, and thence in the direction *q g*, being converged in the focus at *g*, and the image is viewed magnified by the convex eyeglass *h*. Herschel dispensed with the plane mirror altogether, by inclining the concave one, so that the image might be viewed by the eyeglass alone. See *Camera*, *Kaleidoscope*, *Phantasmagoria*, &c.

Inflection of Light.—The direction of the rays of light is changed, as we have seen, in their approach to certain bodies, by reflection and refraction; and, consequently, we must admit that there is some power in these bodies by which such effects are universally produced. If reflection was produced simply by the impinging of particles of light on hard or elastic bodies, or if they were in themselves elastic, the same effects would follow as in the impulse of other elastic bodies; but the angle of incidence could not be equal to the angle of reflection, unless the particles of light were perfectly elastic, or the bodies on which they impinged were perfectly elastic. Now, we know that the bodies on which these particles impinge are not perfectly elastic; and also that, if the particles of light were perfectly elastic, the diffusion of light from the reflecting bodies would be very different from its present appearance; for, as no body can be perfectly polished, the particles of light, which are so inconceivably small, would be reflected back by the inequalities on the surface in every direction; consequently we are led to this conclusion, that the reflecting bodies are possessed of a power which acts at some little distance from their surfaces. If this reasoning is allowed to be just, it necessarily follows that, if a ray of light, instead of impinging on a body, should pass so near to it as to be within the sphere of that power which the body possesses, it must necessarily suffer a change in its direction. Actual experiments confirm the truth of this position; and to the change in the direction of a particle of light, owing to its nearness to a body, we give the name of *inflection*. From one of these experiments made by Sir Isaac Newton, the whole of this subject will be easily understood. At the distance of two or three feet from the window of a darkened room, in which was a hole three-fourths of an inch broad to admit the light, he placed a black sheet of pasteboard, having in the middle a hole about a quarter of an inch square, and behind the hole the blade of a sharp knife, to intercept a small part of the light which would otherwise have passed through the hole. The planes of the pasteboard and blade were parallel to each other; and when the pasteboard was removed to such a distance from the window as that all the light coming into the room must pass through the hole in the pasteboard, he received what came through this hole on a piece of paper, two or three feet beyond the knife, and perceived two streams of faint light shooting out both ways from the beam of light into the shadow. As the brightness of the direct rays obscured the fainter light, by making a hole in his paper, he let them pass through, and had thus an opportunity of attending closely to the two streams, which were nearly equal in length, breadth, and quantity of light. That part which was nearest to the sun's direct light was pretty strong for the space of about a quarter of an inch, decreasing gradually till it became imperceptible; and, at the edge of the knife, it subtended an angle of about 12°, or at most 14°. Another knife was then placed opposite to the former, and he observed that, when the distance of their edges was about the [illegible]th part of an inch, the stream divided in the middle, and left a shadow between the two parts, which was so dark that all light passing between the knives seemed to be bent aside to one knife or the other. As the knives were brought nearer to each other, this shadow grew broader, till, upon the contact of the knives, the whole light disappeared. Pursuing his observations upon this appearance, he perceived fringes, as they may be termed, of different coloured light, three made on one side by the edge of one knife, and three on the other side by the edge of the other; and thence concluded that, as, in refraction, the rays of light are differently acted upon, so are they at a distance from bodies by inflection; and by many other experiments of the same kind, he supported his position, which is confirmed by all subsequent experiments. We may naturally conclude that, from this property of inflection, some curious changes will be produced in the appearance of external objects. If we take a piece of wire of a less diameter than the pupil of the eye, and place it between the eye and a distant object, the latter will appear magnified; for the rays by which the object would have been otherwise seen are intercepted by the wire, and it is now seen by inflected rays, which make a greater angle than the direct rays.

Natural Phenomena.—The most interesting of these is the *rainbow*, which consists of two bows, or arches, extended across the part of the sky, which is opposite to the sun. The innermost of the bows, and which is most commonly seen by itself, it being the principal rainbow, is part of a circle whose diameter is 82°, and is nothing more than an infinite number of prismatic spectra of the sun arranged in the circumference of a circle, the colours being the very same, and occupying the same space as in the spectrum produced from the sun's light. The red rays form the outermost portion, and the violet rays the innermost portion of the bow.

Let A, fig. 23, be a drop of rain, and S *d* a ray from the sun falling upon or entering it at *d*, it will not go to *c*, but be refracted to *n*, where a part will go out, but a part also will be reflected to *q*, where it will go out of the drop, which, acting like a prism, separates the ray into its primitive colours, and the violet will be uppermost, the red lowermost. These colours are all at fixed angles; the least refrangible, or red, makes an angle with the solar incident ray, equal to little more than 42°; and the violet or most refrangible ray, will make with the solar ray an angle of 40°. The ray S *d* would go to *f c*, therefore the angle made with the red ray is S *f q*, and that made with the violet ray is S *c q*; the former is 42° 2′, the latter 40° 17′. The upper, or external bow is formed by two refractions and two reflections: suppose the ray T *r* to be entering the drop B at *r*. It is refracted at *r*, reflected at S, reflected again at *t*, and refracted as it goes out at *u*, whence it proceeds, being separated, to the spectator, at *g*. Here the colours are reversed; the angle formed by the red ray is 51°, and that formed by the violet is 54°.

The external or secondary bow is much fainter than the other, and has the violet outermost and the red innermost. It is part of a circle 104° in diameter. As the rainbow is never seen unless when the sun is shining, and when rain is falling between the spectator and the part of the horizon where the bow is seen, it is obvious that it depends upon the decomposition of the white light of the sun, by the refraction of the drops of rain and their subsequent reflection within the drops—an explanation sufficiently adequate, from the fact that rainbows are produced by the spray of waterfalls, and may be made artificially by scattering water with a brush or syringe when the sun is shining. The primary bow is the effect of one reflection and two refractions of the sun's rays by the drops of rain: the secondary one is formed by two reflections and two refractions. Within the primary rainbow, and immediately in contact with it, there have been seen what are called *supernumerary* rainbows, each of which consists of red and green. Their origin has not been explained. *Lunar* rainbows have been seen; but they differ in no respect from those formed by the solar rays, excepting in the faintness of their light. A *halo* is a circle, either composed of white light, or consisting of the prismatic colours, which is occasionally seen round the sun or moon. *Parhelia* are mock suns, which appear at places where two haloes or arches of luminous circles about the sun intersect each other. The prismatic haloes which are sometimes visible about the sun and moon, in fine weather, when white, thin, fleecy clouds are floating in the atmosphere, are called *coronæ*. Owing to the daszling effect of the sun's rays, the haloes which surround his disk may be seen to most advantage by reflection in a pool of water. These phenomena are attributed to the crystals of ice and snow floating in the atmosphere, and, in some cases, to the action of drops of rain of different sizes. The elevation of coasts, ships, and mountains above their usual level, when seen in the dsitant horizon, has been long known and described under the name of *looming*. The name of *mirage* has been applied by the French to the same class of phenomena; and the appellation of *fata morgana* has been bestowed by the Italians to the singular appearances of the same kind, which have repeatedly been seen in the straits of Messina. When the rising sun throws his rays at an angle of 45° on the sea of Reggio, and neither wind nor rain ruffle the smooth surface of the water in the bay, the spectator, on an eminence in the city, who places his back to the sun and his face to the sea, observes, as it were upon its surface, numberless series of pilasters, arches, and castles distinctly delineated; regular columns, lofty towers, superb palaces, with balconies and windows; extended valleys of trees, delightful plains, with herds and flocks; armies of men on foot and horseback, and many other strange figures, in their natural colours and proper actions, passing one another in rapid succession. When vapours and dense exhalations, rising to the height of about twenty feet, appear, then the same objects are seen depicted, as it were in the vapour, and suspended in the air, though with less distinctness than before. Captain Scoresby, when navigating the Northern seas, was able to recognise his father's ship when below the horizon, from the inverted image of it which appeared in the air. "It was," says he, "so well defined, that I could distinguish, by a telescope, every sail, the general rig of the ship, and its particular character, insomuch that I confidently pronounced it to be my father's ship, the Fame, which it afterwards proved to be; though, in comparing notes with my father, I found that our relative position at the time gave our distance from one another very nearly thirty miles, being about seventeen miles beyond the horizon, and some leagues beyond the limit of direct vision." In the sandy plains of Egypt the mirage is seen to great advantage. These plains are often interrupted by small eminences, upon which the inhabitants have built their villages, in order to escape the inundations of the Nile. In the morning and evening, objects are seen in their natural form and position; but where the surface of the sandy ground is heated by the sun, the land seems terminated, at a particular distance, by a general inundation, the villages beyond it appearing like so many islands in a great lake, and between each village an inverted image of it is seen. This optical deception has been noticed from the remotest times. The prophet Isaiah alludes to it, when he says, "and the parched ground shall become a pool." The cause of these phenomena consists in variations in the refractive power of the atmosphere, which may be proved by actual experiment. This has been done in a variety of ways; but we shall only mention the method adopted by doctor Brewster. He held a heated iron above a mass of water bounded by parallel plates of glass: as the heat descended slowly through the fluid, a regular variation of density, diminishing from the bottom to the surface, took place. On withdrawing the heated iron, and putting a cold body in its place, or even on allowing the air to act alone, the superficial stratum of water gave out its heat so as to produce a decrease of density from the surface to a certain depth below it. Through the medium thus constituted, the phenomenon of the mirage was observable in the finest manner. See *Fata Morgana*.

Colours of the Atmosphere.—As the earth is surrounded with an atmosphere, varying in density from the surface of the globe, where it is the densest, to the height of about forty-five miles, where it is extremely rare, and just able to reflect the rays of the setting sun, the rays of the sun, moon, and stars are refracted into curve lines, unless when they are incident upon it perpendicularly. Hence the apparent altitude of the celestial bodies is always greater than their real altitude, and they appear above the horizon when they are actually below it. But while the solar rays traverse the earth's atmosphere, they suffer another change from the resisting medium which they encounter. When the sun, or any of the heavenly bodies, is considerably elevated above the horizon, its light is transmitted to the earth without any perceptible change; but when these bodies are near the horison, their light must pass through a long tract of air, and is considerably modified before it reaches the eye of the observer. The momentum of the red, or greatest refrangible rays, being greater than the momentum of the violet, or least refrangible rays, the former will force their way through the resisting medium, while the latter will be either reflected or absorbed. A white beam of light will therefore be deprived of a portion of its blue rays by its horizontal passage through the atmosphere, and the resulting colour will be either orange or red, according to the quantity of the least refrangible rays that have been stopt in their course; hence the rich and brilliant hue with which nature is gilded by the setting sun, and hence the glowing red which tinges the morning and evening cloud. We have already seen that the red rays penetrate through the atmosphere, while the blue rays, less able to surmount the resistance which they meet, are reflected or absorbed in their passage. It is to this cause that we must ascribe the blue colour of the sky, and the bright azure which tinges the mountains of the distant landscape. As we ascend in the atmosphere, the deepness of the blue tinge dies away; and to the aeronaut who has soared above the denser strata, or to the traveller who has ascended the Alps or the Andes, the sky appears of a deep black, while the blue rays find a ready passage through the attenuated strata of the atmosphere. It is owing to the same cause, that the diver at the bottom of the sea is surrounded with the red light which has pierced through the superincumbent fluid, and that the blue rays are reflected from the surface of the ocean. Were it not for the reflecting power of the air, and of the clouds which float in the lower regions of the atmosphere, we should be involved in total darkness by the setting of the sun, and all the objects around us would suffer a total eclipse by every cloud that passed over his disk. It is to the multiplied reflections which the light of the sun suffers in the atmosphere that we are indebted for the light of day, when the earth is enveloped with impenetrable clouds. From the same cause arises the sober hue of the morning and evening twilight, which increases as we recede from the equator, till it blesses with perpetual day the inhabitants of the polar regions.

Coloured Shadows.—The shadows of bodies placed only in one light, and at a distance from all other bodies capable of reflecting light, must necessarily be black. In a summer morning, or evening, however, the shadows of bodies formed either by the light of the sun, or by that of a candle, have been observed to be blue: this obviously arises from the shadows being illuminated with the light of the blue sky. The colours thus produced vary in different countries, and at different seasons of the year, from a pale blue to a violet black; and when there are yellow vapours in the horizon, or yellow light reflected from the lower part of the sky, either at sunrise or at sunset, the shadows have a tinge of green, arising from the union of these accidental rays with the blue tint of the shadow. If the light of the sun or of the candle be faint, then the shadow of the body, formed by the light of the sky, will be visible also, and the two shades will be the one blue and the other a pale yellow. This fact has been ascribed to the circumstance of the light of the candle and that of the rising and setting sun being of a yellowish tinge; but though this will increase the effect, it is not the main cause of it, as one of the shadows would be yellow, even if the light of the sun and the candle had been perfectly white. The phenomena of coloured shadows are sometimes finely seen in the interior of a room, the source of one of the colours being sometimes the blue sky, and the other the green window blinds, the painted walls, or the coloured furniture.

Converging and diverging Beams.—When the sun is descending in the west, through masses of open clouds, the diverging of his beams, rendered visible by their passage through numerous openings, forms frequently a very beautiful phenomenon. It is sometimes accompanied with one of an opposite kind, viz. the convergency of beams to a point in the eastern horizon opposite to the sun, and as far beneath the horizon as the sun is above it, as if another sun, throwing out divergent beams, were about to rise in the east. This phenomenon is rarely seen in perfection, and has never been observed until within a few years. In order to explain it, let us suppose a line to join the eye of the observer and the sun. Let beams issue from the sun in all possible directions, and let us suppose that planes pass through these beams, and through the line joining the eye of the observer and the sun, which will be their common intersection, like the axis of an orange, or the axis of the earth, through which there pass all the *septa* of the former, and all the planes passing through the meridians of the latter. An eye, therefore, situated in this line, or common intersection of all the planes, will, when looking at a concave sky, apparently spherical, see them diverging from the sun on one side, and converging towards the opposite point. Two deeply interesting branches of optics remain yet to be considered; namely, the laws of the *double refraction* and *Polarization* of light. q. v.

OPTIMATES, with the Romans; the party of the nobility (tories), in contradistinction to the *populares* (men of the people—liberals).

OPTIMISM; that philosophical and religious opinion which maintains that this world, in spite of its apparent imperfections, is the best, and could not be otherwise than it is. Even the Stoics and Plotinus were of this opinion. This name, however, is chiefly given to the doctrine of Leibnitz—that God has, among the possible worlds which presented themselves to his understanding, chosen and created the best. Leibnitz developed this doctrine in his *Theodicea*, particularly with reference to the doubts and objections of Bayle, on account of the evil in the world, and showed that what appears imperfect considered by itself, is by no means imperfect considered with regard to the whole, and that the single parts are the best when considered in their connexion with the whole. This philosophical doctrine was generally reduced to the dilemma—If this world were not the best, God either did not know a better one, or was unable or unwilling to create it—suppositions which impugn his omniscience, omnipotence or perfect benevolence. Hence the inference was, that this world must be considered the best. See Leonh. Creuzer, *Leibnitii Doctrina de Mundo optimo*; see also, the article *Candide*.

ORACLES; responses given by persons who pretended to divine inspiration; also the places where the responses were uttered with certain prescribed ceremonies. There is not a sufficient stock of trustworthy information from antiquity to determine their origin or nature. The origin of the Egyptian oracles is dated at a period to which not even traditions, and much less historical monuments, extend. The oldest was that at Meroe; next, those at Thebes and Ammonium. In each of these places, Jupiter Ammon was the presiding deity. The oracle at Dodona, the oldest in Greece, was formed on the model of the last mentioned, but united the Egyptian and Pelasgian character. The account given by Herodotus of the origin of the Pelasgian oracle, shows that a colony from Africa attempted, by such an institution, to establish themselves in Greece. But a sacred tree in this place was, at an earlier period, oracular, and the rustling of its branches had been received as responses: consecrated women from Africa (prophetesses, the black doves of Herodotus) only dedicated this Pelasgian oracle to Jupiter Ammon. According to Ritter, the oracle of Dodona (formerly Bodona) points to the service of Buddha. Of equal antiquity, perhaps, was the oracle in Bœotia, which first belonged to the Earth, then to Themis, and afterwards was transferred to Apollo. Still later was instituted the oracle at Delphi, which became the most important of all, partly from its favourable situation, and partly from its connexion with the council of the Amphictyons, at Pylæ. Besides, Jupiter had an oracle at Elis, at Pisa, and in a subterranean cave in Crete; and Apollo at Delos, where the whispering of the trees gave responses, at Miletus, where a sacred fountain, at Claros, not far from Colophon, where a consecrated river, inspired the priests, and many others. In addition to these, the oracle of Trophonius, at Lebadia, in Bœotia, and that of Amphiaraus, at Oropus, on the borders of Attica and Bœotia, were in high reputation in Greece. Juno had an oracle in the Corinthian territory; Hercules, at Bura, in Achaia, where answers were given by throwing dice; Bacchus, at Amphiclea, in Phocis, which returned answers in dreams, &c. Tzetzes mentions an oracle of Ulysses; and other heroes and prophets had theirs. The Romans had no domestic oracles, if we except the Albunea, the Cumæan Sibyl, the Sibylline books, the oracle of Faunus and of Fortuna at Præneste (which belonged to the earliest times, and afterwards lost their reputation), but had recourse to those of Greece and Egypt. In the founding of cities and colonies, the introduction of new governments, the undertaking of important enterprises, both in war and peace, and particularly in all cases of great necessity, the oracles were consulted, and rich gifts presented to them; their priests needed great watchfulness and prudence not to expose themselves. Darkness and ambiguity in the responses was the common resource. Sometimes, however, there were obvious failures. But, notwithstanding these, and notwithstanding well-known instances of corruption, they long maintained their standing, and sunk only with the freedom and independence of Greece. Under the reign of Theodosius, the temples of the prophetic deities were shut up or demolished. Van Dale and Fontenelle thought to explain the whole system of oracular responses by priestly management, founded on the popular delusion. Others have thought this insufficient to account for the fact that the wisest men in a refined nation received them as sacred for centuries, as in Greece.—See Clavier's *Mémoire sur les Oracles des Anciens* (1819).

ORAMA, DIORAMA. See *Panorama*.

ORANGE (*citrus aurantium*); a low, evergreen, branching tree, bearing oblong, oval, acute, smooth, and shining leaves, inserted on winged leaf-stalks, by which character it is easily distinguished from the lemon. The flowers are white, containing about twenty stamens, and are disposed in clusters of from two to six upon a common peduncle. The fruit is globose, bright yellow, and contains a pulp, which consists of a collection of oblong vesicles filled with a sugary and refreshing juice: it is, besides, divided into eight or ten compartments, each containing several seeds. The principal varieties are the sweet or China, and the bitter or Seville orange; the Maltese orange is also deserving of notice, from its red pulp. Though now extensively cultivated in the south of Europe, the introduction of the orange is of modern date, and it was unknown in that continent till about the beginning of the fifteenth century. At the present time, it forms an extensive branch of commerce between the Mediterranean and the more northern countries. It is exceedingly long-lived, and is still esteemed young at the age of a century. An essential oil is obtained from the flowers, which is hardly less esteemed than the celebrated ottar of roses. *Bergamot* is a well-known perfume, obtained from the rind of a variety of the orange, and has received the name from the town of *Bergamo*, in Italy, where this variety is much cultivated. The wood of this tree is fine-grained, compact, susceptible of a fine polish, and is employed in the arts. The orange, together with the lemon, citron, lime, shaddock, and indeed almost the entire family *aurantiaceæ*, is a native of tropical Asia and the East Indies. A singular exception is found in America: a species of orange, bearing fruit of a very agreeable flavour, is extremely abundant in East Florida, and according to the testimony of scientific travellers, is undoubtedly native: it has not, however, been accurately compared with other species, and, what is more remarkable, although mentioned by early travellers, has not hitherto found its way into systematic works on botany.

ORANGE; an ancient principality in France, which, from the eleventh to the sixteenth century, had its own princes. Philibert of Chalons, the last prince, having died, without issue, in 1531, the principality passed, through his sister (who was married to the count of Nassau), to the house of Nassau. It continued in this family till the death (1702) of William Henry of Nassau-Orange (William III. of England), when the succession became the subject of a long contest. The principal claimants were Frederic William I., king of Prussia (who claimed through his mother), and the prince of Nassau-Dietz, stadtholder of Friesland (who claimed by the will of William III). The king of Prussia, notwithstanding the protest of the other claimants, ceded the principality, by the peace of Utrecht (1713), to France. The reigning dynasty of the Netherlands is of the house of Orange, and the heir-apparent bears the title of *prince of Orange*. In November, 1830, the national congress of Belgium declared the house of Orange-Nassau to be for ever excluded from all power in Belgium.

Orange, the capital of the principality, an old city, known to the Romans under the name of *Arausio*, contains, at present, 8864 inhabitants. It is situated on the Meyne, in the department of Vaucluse, five leagues north of Avignon.

ORANGEMEN; the name given by the Catholics in Ireland to their Protestant countrymen, on account of their adherence to the house of Orange. Tyrconnel, who had been appointed lord-lieutenant of Ireland by James II., attempted to hold the island for his master, and was supported in this design by the Catholics, while the Protestants declared for William. The battle of the Boyne (1690) gave the superiority to the latter, and the Catholics were subjected to heavy civil and religious disabilities. See *Catholic Emancipation*; also the article *Ireland*.

ORATORIO; a musical drama of a dignified character, which is destined only for musical execution, not for theatrical action. Hence, on the part of the poetry, it requires, though not in the strict sense of the theatrical drama, the representation of an action or event, either immediately by the persons concerned in the action or event, or mediately by those who narrate the circumstances, and by the chorus at intervals, in which the whole body of individuals concerned express their feelings in music. The subject should be of a noble character (as, for example, the Creation), and the music adapted to express various elevated and tender affections. Oratorios are generally on religious subjects, particularly biblical histories and events. The oratorio, properly speaking, commenced when sacred music was distinctly separated from the worldly. It had its origin partly in the songs and alternating choruses of the Christian pilgrims, who sung on their pilgrimages, in the time of the crusades, of the life and death of the Redeemer, the last judgment, and other religious subjects, in the streets and public places; and partly in the mysteries, or dramatic representations of sacred narratives. As early as 1243, a *spirituale commedia* was performed in Padua. St Philip of Neri (born at Florence, 1515, and died at Rome, in 1595), the founder of the congregation of priests of the oratorio, is regarded as the person who first instituted regular oratorios about the year 1540, in order to direct the fondness for the musical drama to religious subjects. The oratorios were then little more than hymns accompanied by instrumental music, whence they first appeared in Rome under the name of *laudi spirituali*. The *recitative* or musical narration, was invented afterwards. At first, however, the oratorios were narratives, rather than dramas, for an actor related the story to the spectators, and detailed the principal points; and only a few musical passages were performed, by which the feeling appropriate to the different situations was expressed. These performances in sacred music obtained the name of *oratorios* in the middle of the seventeenth century, either from the congregation before spoken of, or from the church where they were executed. Emilio del Cavalieri (about 1590) composed oratorios with recitatives. In the seventeenth century, the oratorio, as well as the opera, became developed in its poetical and musical form. The first oratorios had short choruses, in simple counterpoint; but, in the second half of the seventeenth century, it was customary to conclude with a duet every separate portion of an oratorio, which generally occupied about an hour in the performance. In the beginning of the eighteenth century, Pariati, the Jesuit Ceva, Lel. Orsini, Spagna, Zeno, and Metastasio, wrote oratorios, and Caldara, Jomelli, Leo, Buononcini, composed the music. A more elevated character was given to the oratorio by Handel, who devoted all his power to the chorus till 1732. Haydn distinguished himself by richness of description, and he introduced worldly subjects and music into the oratorio.

Oratorio signifies, likewise, a place of prayer, especially in monasteries.

ORATORY, Priests of the; a religious order founded by Philip Neri, in 1574, for the study of theology, and for superintending the religious exercises of the devout. The members are not bound by the monastic vows. In Italy, the order still exists; but the more important congregation of the fathers of the oratory of Jesus in France—which was founded in 1611, at Paris, and has contained several distinguished members, as the philosopher Malebranche, the Orientalist Morin, and the liberal theologian Richard Simon—is no longer in existence. The Italian order follows, as did the French, the rule of St Augustine.

ORBILIUS PUPILLUS; a grammarian of Beneventum, who taught in Rome during Cicero's consulship. He has acquired celebrity by the mention which Horace has made of him (Ep. 2, 1, 70), as the *plagosus Orbilius* (the flogging Orbilius).

ORBITS OF THE PLANETS. See the article *Astronomy;* also the articles *Keplar* and *Planets.*

ORCADES. See *Orkney Islands.*

ORCHALL, or ARGOL, (*rocella tinctoria*); a species of lichen, celebrated for yielding a fine purple colour, which is employed in dyeing. It is chiefly obtained, in commerce, from the Canaries, Cape Verd islands, and the Grecian archipelago. It is the substance generally employed for colouring the spirits of thermometers; and it is a remarkable circumstance that, after the colour has been destroyed by time, it is again restored on breaking the tubes.

ORCHAN. See *Ottoman Empire.*

ORCHESTRA; the space in theatres between the seats of the spectators and the stage, appropriated by the Greeks to the chorus and the musicians, by the Romans to the senators, and by the moderns to the musicians. It is also used for the part of concert-rooms assigned to the musicians, and, lastly, for all the instruments performing together in modern concerts, operas, or sacred music. See *Architecture.*

ORCHESTRICS; the same as ὀρχησις, q. v., in the article *Dancing.*

ORCO RIVER, CASCADE OF. See *Cataract.*

ORCUS; the same as *Hades*, or *Pluto;* thence, also, the *kingdom of Pluto* (the infernal regions). See *Pluto*, and *Tartarus.*

ORDEAL. It was formerly believed by almost all nations, that, when proofs of right or wrong, innocence or guilt, were wanting, the God of truth and justice would himself interpose, and make known the truth by a miracle. In accordance with this opinion, a person suspected of any crime was made to perform solemnly before the priests certain acts which would, in the natural course of things, be injurious to him; and if he escaped unhurt, he was declared to be innocent. These processes were called *ordeals*, or *judgments of God*, and were in use particularly among the Germans. They are found also in the ancient sacred writings of the Hindoos. As success or failure, except in a few cases, depended on those who made the requisite preparations, a wide field was opened to deceit and malice, especially of the priests.

The following ordeals were in use in Germany and England:—The judicial duel, in which the conquered was viewed as guilty; the ordeal of fire; the ordeal of water; the hallowed morsel; the trial of the eucharist; the judgment of the cross; and the trial of the bier. In criminal cases, where the perpetrators of the deed could not be discovered, these ordeals were applied; some of them even in civil cases, so that the defendant could free himself in this way from claims or charges not sufficiently substantiated. Even among the Celts, children, whose mothers were suspected of adultery, were placed in a shield on the Rhine, and if they sunk, it was inferred that the suspicion was correct. The Salian Franks, at the beginning of the fifth century, used the ordeal of hot water, and the ordeal of cold water was introduced afterwards. After the introduction of Christianity, the use of ordeals soon became general; for the oath of purgation was but little, if at all, known, and by means of ordeals an opportunity was given to the clergy to subject legal trials of every kind to their own decisions, and thus to increase their authority. The ordeal of fire was as follows:—The accused was compelled to walk barefooted over glowing coals, or over nine red-hot ploughshares, or to carry a red-hot iron in his naked hand a considerable distance; or else glowing coals were laid upon his feet, or he was made to walk through fire: in the last trial, the accused was often dressed in a robe covered with wax (the trial of the waxen shirt;) if he was unhurt by the fire, it was regarded as a proof of his innocence. In other cases, a priest put the hallowed morsel into the mouth of the accused, with various imprecations. This was called the "trial by the hallowed bread or cheese." If the accused swallowed it instantly, and felt no sensation of sickness or pain, he was freed from punishment. The trial of the eucharist was used chiefly among the clergy and monks. They took the sacrament in attestation of their innocence, and it was believed that God would immediately smite the guilty with sickness or death. The trial of the cross was of two kinds. Both the accuser and the accused were placed under the cross with their arms extended or crosswise, and the one was condemned who first moved his hands, or suffered them to fall: or else the supposed criminal was conducted into a church, or placed before relics. Two dice were then produced, one of which was previously marked with a cross. Of these, one was taken up at hazard. If it happened to be the die having the sign of the cross, the accused was exempted from punishment. Finally, and, indeed, from the earliest times, the trial of the bier was used in the crime of murder; that is, the murdered person was placed upon a bier, and the supposed perpetrator made to touch the body, especially the wounds. If blood flowed out, or foam appeared at the mouth, or the dead body altered its position, the suspected person was considered guilty. Sometimes, instead of the whole body, only the hand was taken. Superstition and artifice gave to these absurd ceremonies the highest authority; and even the prohibitions of enlightened emperors from the time of Louis the Pious till the ninth century, were insufficient to abolish them. The papal chair had more influence in restraining them by frequent denunciations, and by the introduction of an improved judicial system. Indeed, many rulers and magistrates saw their absurdity. Hence, after the fourteenth century, ordeals became more uncommon, and, in the fifteenth, they were wholly put down by the increasing use of the canon law, which invented new means for the removal of suspicion, especially the oath of purgation, and still more by the universal use of the Roman law. In the sixteenth century, only the trial of the bier was used, and this continued even into the first part of the eighteenth. In consequence of the still prevalent belief in sorcery, the ordeal by cold water was also retained in the trials of witches. The supposed witches were placed in the water, and if they floated they were declared guilty. Besides this ordeal (found in Prussia in the seventeenth century, and in the neighbouring countries in the first half of the eighteenth,) there was also the weighing of witches: they were weighed, and if they were found to be uncommonly light, they were pronounced guilty. These foolish customs were gradually done away, when Thomasius succeeded in almost wholly annihilating the belief in witches. It deserves to be mentioned as a singular circumstance, that, as lately as 1728, several witches were weighed at Szegedin, in Hungary. With the exception of these few relics of ordeals, the end of the fifteenth and the beginning of the sixteenth century are to be regarded as the closing period of them in Europe. But it is to be lamented that the Roman law substituted in their place an equally horrid process in criminal cases, viz. the torture, which was originally applied only to slaves, but afterwards to freemen also. Ordeals are still found in many nations out of Europe. Thus the Senegambians, in Africa, apply a red-hot iron to the tongue of a person suspected of crime. Some negroes, on the coast of Guinea, put into the hands of the accused herbs and barks of a peculiar character, and suppose they have the property of burning the guilty. The natives of Pegu and Siam have the ordeal of cold water. The Tschuwasses and Ostiacks, in Russia in Asia, connect the trial of the consecrated morsel with an oath. The Chinese have the ordeals by fire and water; but the chief ordeals are among the Hindoos, in Congo, and other places.

ORDERICUS VITALIS, a historian of the twelfth century, of a French family, but born in England, at the age of ten was sent for education to an abbey in Normandy. He entered into the order of priesthood, but devoted his life to literary studies. He died after 1143. He wrote an Ecclesiastical History in thirteen books, published in Duchesne's *Historiæ Norman. Scrip.*, and in other collections.

ORDERS IN COUNCIL. See *Privy Council.*

ORDERS, Military. The secular military orders are societies established by princes, the members of which are distinguished by particular badges, and consist of persons who have done particular services to the prince and state, or who enjoy, by the privileges of birth, the highest distinctions in the state. They originated from the institutions of chivalry and the ecclesiastical corporations, and were, in the beginning, fraternities of men, who, in addition to particular duties enjoined by the law of honour, united for the performance of patriotic or Christian purposes. Free birth and an irreproachable life were the conditions of admission. The oldest Christian orders of which mention is made, are the order *sanctæ ampullæ*, which Clovis I. founded in the year 499, the order of the oak, which Garcias Ximenes, king of Navarre, founded in 722, and the order of the genet (*de la genette*), founded by Charles Martel, in 726; of which, however, the two first are uncertain. The first orders after these arose during the time of the crusades, and were an example for all future orders. From societies established, under certain rules, for the care of sick persons, as well as the diffusion and support of the Christian religion, first proceeded the religious military orders, of which the oldest is the order of St John of Jerusalem. Their laws were similar to the rules of the monastic orders. The pope's confirmation was essential to their establishment, and he was in a manner their head; their superiors and masters, however, were chosen by themselves, by a majority of voices. On their model the secular military orders were formed in later times, which united religious with military exercises. They also bore outward badges, as the religious orders had done in earlier times, after the example of the crusaders. This, with the religious military orders, was most commonly a cross; which the secular adopted also; differing, however, from the simple emblems of their spiritual brethren by the intermixture of worldly ornaments, by a diversity of colours, precious stones, and precious metals. The subsequent period made changes therein, and added ribands and stars. But the original pious object of these orders was also changed, and they acquired by degrees their present character. The statutes, indeed, sometimes speak of the defence of the Christian faith, and similar pious objects; but those precepts are not carried into effect.—See Perrot's *Collect. histor. des Ordres de Chevalerie civils et militaires*, &c., with forty coloured copperplates (Paris, 1820, 4to); Wippel's *Die Ritterorden, ein tabell. chronol.-liter.-hist. Verzeichniss uber alle weltlichen Ritterorden* (2 vols., Berlin, 1817 and 1819, 4to).

ORDERS, in natural history, are the great divisions of classes of animals, plants, or minerals; for example, the class *mammalia*, or animals which suckle their young, is divided into ten orders, by Cuvier, viz., 1. two-handed animals; 2. four-handed animals, &c.

ORDERS OF ARCHITECTURE. See *Architecture.*

ORDERS, Religious, are associations bound to lead strict and devotional lives, and to live separate from the world. They are subjected to a perpetual obligation to their monastic vows, or the rules of their order. (See *Monastery.*) The monks and nuns of the East, particularly of the Greek church, follow the rules of St Basil, as do also the Basilians in Spain. In the Roman church, on the contrary, the fundamental rules of the monasteries were drawn up by St Benedict of Norcia, who is to be regarded as the first founder of a spiritual order. The monasteries of the Eastern churches bear the names of their common founders and guardian saints, but without being so closely united to one another as the members of spiritual orders in the West. According to the rules of St Benedict, the principal vows to be assumed by every novice after a year's probation are those which enjoin the duty of prayer at certain hours of the day, labour, perpetual celibacy, and a renunciation of the pleasures of the world, unconditional obedience to the superiors of the order, and constant residence in the monastery. As these rules and the black cowl were common to almost all the monks and nuns in the West, from the sixth to the beginning of the tenth century, the Benedictine order may be regarded as the only one existing during that period. Still, however, the monasteries belonging to it were under the government of bishops, with no common superiors, and were divided into several congregations, differing by a more or less strict observance of their rules; for example, the Benedictines of Clugny, of Monte-Casino, of Monte-Vergine, of Monte-Oliveto (*Olivetans*), of Valladolid, of St Vannes, of St Maurus, of Molk, &c. (See *Benedictines.*) The desire to give more strictness and sanctity to the monastic life, was manifest in the middle ages, by the establishment of new rules, founded on those of St Benedict. Thus arose the Camaldulians, the gray monks of Vallombrosa, the Silvestrines, the Grandmontanists, the Carthusians, the Celestines, the Cistercians, the Bernardines, Feuillans, Recollets, the nuns of Port Royal, and the Trappists, and the order of Fontevraud. The reputed rules of St Augustine were adopted by a large number of religious orders. Augustine had united only the clergy of his cathedral, and several other churches of his diocese, to lead a canonical life; that is, a life of celibacy, poverty, seclusion, and formal devotion at certain prescribed hours; but he never had an idea of founding an order of monks. Moreover, the monks, who were reckoned among the laity in the seventh century, could not adopt the rules of Augustine, which were first designed for the clergy. But, in the eighth century, they began to be viewed as members of the clerical order, and in the tenth, by receiving permission to assume the tonsure, they were formally declared clergymen. Indeed, public opinion and several papal bulls placed them, as superior in sanctity, above the secular clergy, who, for this reason, often became monks, or formed associations for the performance of monastic vows, and leading canonical lives. Of this description are the canons regular, whose constitution was formed on the rules of St Augustine; for example, the monks of St Savior in the Lateran, of the Holy Sepulchre, of St Genevieve, &c. The Præmonstratenses, Augustines, Servites, Hieronymites or Jeronymites, Jesuates, and Brigittins, are regular orders, according to the rules of St Augustine. Under the class of regular orders, but more devoted, according to the ancient ideas of monastic life, to silent contemplation, and secluded from the world, are included also the peculiarly constituted Carmelites. The Trinitarians or Mathurines and the order of Grace showed more inclination to serve the world. But love of hierarchal importance, and influence over the world, was the prominent characteristic of the Mendicants, an order of Dominicans (preaching monks, Jacobins), established in the beginning of the thirteenth century, and of the Franciscans (Minorites, Conventuals, Observantines, Cæsarines, Amadeists, nuns of St Clare, Spirituals, Eremites or Celestines, Fraticelli, Alcantarines, Cordeliers, Capuchins); from which the Minims or Paulanites, who belong to the same class, are distinguished by their devotion to a silent, contemplative life. The Dominicans and Franciscans received from the popes certain immunities which are known as the privileges of mendicant friars, and they were afterwards granted in part to the Carmelites, Augustines, Servites, and Paulanites. They consisted in freedom from all secular and episcopal jurisdiction; in the privilege of demanding alms of every body out of the monasteries; in authority to preach every where, without regard to the parochial rights of the priests; to hear confessions, to read masses, and sell papal indulgences. These immunities served as a compensation for the strictness with which they were forbidden, by their ancient rules, to possess any property. Although the establishment of new orders of monks had been expressly prohibited by some councils, several new institutions of this nature, which arose after the beginning of the sixteenth century, were able, by promising to devote their exertions to the common good, to procure the approbation of the pope, and thus to escape the prohibition, provided that they did not pass for new orders of monks, but called themselves regular canons of St Augustine, and dressed in the black garb of the secular clergy. The immense loss which was sustained by the ancient orders, in consequence of the reformation, induced the popes zealously to encourage these establishments. To this rubric belong the Theatines, the Barnabites, the Somaskians; in France, the Priests and Fathers of the Oratory, the Lazarists, Bartholomæans, Piarists, and the Brethren of Mercy. As the secluded life of the monks, soon after the origin of monasteries, had given rise to similar associations of pious females, so nuns commonly banded together as new orders of monks arose, and formed societies under similar names and regulations. There were Benedictine, Camaldulian, Carthusian, Cistercian, Augustine, Præmonstratensian, Carmelite, Trinitarian, Dominican, Franciscan, Paulanite nuns, and many orders of regular canonesses, whose monastic vows and the colour of their dresses corresponded with those of the male branches; but they were excluded from the priestly influence which the monks were able to exercise. The male branch of an order is denominated the *first order*, and the female the *second*; thus the Capuchin friars belonged to the first order, and the Capuchin nuns to the second order of St Francis. There were also congregations of nuns, who united with certain orders of monks, without adopting their names; as the Urbanist nuns, the nuns of the Conception of the Blessed Virgin, in Italy and Spain, and the nuns of the Annunciation of Mary, who belonged to the second order of St Francis, and the English sisters, who followed the rule of the Barnabites. The nuns of the penance of St Magdalen, the Salesian nuns, the celestial Annunciadæ, the Ursuline and Hospitaller Nuns, or Sisters of Mercy, are female orders existing independently of any male orders, and living according to the rules of St Augustine. Besides the nuns composing the second order, almost all the important religious orders received new accessions in the lay brethren (*fratres barbati*, or *conversi*) and lay sisters, who were taken to perform the necessary labours of the monasteries, and to manage their intercourse with the world, in order that the choristers, that is, the proper religious, who performed the appointed prayers in the choirs of the churches, might not be distracted in their studies and devotions. The first example of this arrangement was given by the order of Vallombrosa, and soon imitated in the monasteries of other orders. It became gradually an instrument of considerably increasing the power and influence of the monastic institution.

Under the name of *offerings* and *presents*, vast numbers devoted themselves, their property, and their influence, to the service of religious orders, without formally becoming members of them. Whole families, married persons of all ranks, in this way made themselves dependent on the regular clergy; and, as they imagined that they should thus gain nearer access to heaven, the connexion appeared to them desirable, though it was attended with the heaviest sacrifices. St Francis of Assisi first gave this relation of dependence a distinct form. He united the laymen, who wished to associate with the brethren of his order, without becoming clergymen, into a particular society, under the name of the *third order of Minorites*. After this model were formed (besides all the mendicant orders) the Cistercians, the Trinitarians, and the Monks of Grace of the third order, of whom only a few went into retirement, and bound themselves by solemn monastic vows. Most of the members, indeed, were laymen, who retained their civil and domestic relations, and engaged only to lead a religious life, without quitting the world. This engagement required them every day to repeat some *Ave Marias* and the *Paternoster*, and to fast at certain specified times. The members of every third order are called *tertiarians* or *tertians*, and are distinguished by their rich presents to the monasteries and mendicants of their order, and their zeal, in every way, to promote its interests. They are at liberty to wear the full dress of their order, but generally content themselves with wearing the scapulary, or girdle, like an amulet, under their ordinary garb. This badge of connexion with a religious order, to which superstition attributes a mysterious and heavenly energy, is purchased at great expense; and with its possession is commonly connected the assurance of great indulgence.

Besides these sources of income, the association of third orders affords to the first so many means of increasing its power and influence, that the care with which they are kept up, extended and favoured, can easily be accounted for. The bitterest dissensions at length arose between the different religious orders, in consequence of this association of the laity with the clergy, and could be settled only by formal compacts, marking out the limits of their possessions and their influence, and by mutual agreements respecting the deserters from one order to another. To the original intent of monastic institutions of serving God by prayer, and the world by instruction, and example, and benevolence, the policy of the popes gradually added the design of ruling nations. This is clearly shown in the constitutions of the spiritual orders. The orders first established governed themselves in an aristocratico-republican manner. The Benedictine monasteries were long independent of one another. The Cistercians obeyed a high council, made up of the abbot of Citeaux, as the superior, the abbots of Clairvaux, La Ferté, Pontigny, and Morimand, and twenty other counsellors. The abbot and priors of all the Cistercian monasteries were responsible to the general chapters, held at first every year, and afterwards every third year. Inferior orders, as the Carthusians, Grand-montanists, &c., with similar constitutions, had to contend with bishops also, whose ancient claims to the jurisdiction of all the monasteries in their diocese they could not so easily throw off as the Benedictines and Cistercians, who were favoured by the papal immunities.

But the *mendicant* orders, at their very commencement, placed themselves in a much more intimate connexion with the popes. Dependent solely and immediately on Rome, by virtue of the privileges which they received, they preserved the strictness of their organization with a success which, in the government of large associations of men, could be maintained only by the unity of the ruling power, and the blind obedience of the subjects. Most of the other orders soon adopted the same constitution. Accordingly, at the head of every religious order stands a general, or governor, who is chosen every three years from the officers of the institution, resides at Rome, and is responsible only to the pope. In some orders, however, he has in his attendance a monitor, who watches his proceedings in behalf of the order, and may remind him of his duty, when his proceedings are unconstitutional. The counsellors of the general government are the provincials—officers to whom is committed the supervision and government of monasteries in the separate provinces. They form, under the presidency of the general, the chapter of the whole order, and preside, as general vicars, over the provincial chapters, in which the superiors of the separate monasteries of a province take part, as members entitled to vote (*suffraganei.*) These officers have various names in the different orders, viz. *abbots*, *priors*, *superiors*, *ministers*, *guardians*, *provosts*, or *rectors*; and, in the sense of the canon law, they are *prelates*. They transact each of them the affairs of his own monastery in a chapter or assembly, with the religious in it belonging to the choir. Hence the choristers are denominated *conventuals* and *fathers* (*patres*,) to distinguish them from the inferior monks, who are called *brothers* (*fratres*,) because they have not been consecrated to the office of priests, or are only lay brethren, who perform the domestic duties of the monastery. Moreover, in the mendicant orders, none but the latter are sent out to receive contributions. The fathers alone, on the other hand, are authorized to perform the duties of the priestly office in the monastery, and in parishes under their patronage. The chapters of the individual monasteries of a province are under the provincial, as their officer in the first instance. The highest tribunal for all the members of an order is its general, who is also the president of the second and third orders. The convents of the nuns are under a similar government, only they cannot be without a provost, who, with his chaplains, performs religious services among them. If they belong to no second order, they are, like the Hospitallers, and all unprivileged monasteries, under the jurisdiction and superintendence of the bishop, or the prelate of the diocese where they reside, who is clothed with episcopal authority. Unprivileged orders and monasteries have always served less the designs of the popes, and fulfilled their original destination more faithfully (unless they have swerved from their rules,) than the privileged and strictly exclusive orders. The latter have violated more deeply the religious object of their institution, in proportion as their submission to their superiors has been more strict, and in proportion as their principal aim has been to exercise a dominion over the minds of men, to acquire political influence, and to promote, with all their power, the claims of the popes. The mendicant orders have been the most faithful, successful, and useful tools of the Roman chair, in executing its bold designs, and have therefore been justly called the *standing army of the pope*. They are by no means left without encouragement; and monks who have distinguished themselves by zeal or talent, in the service of his holiness, may expect the richest benefices from his favour. To bishoprics, which are not dependent on noble chapters, they have much readier access than the common secular clergy; and it is well known that generals and counsellors of religious orders have frequently become cardinals, and have even been elevated to the papal dignity.

The most important of all the religious orders have been the Jesuits, and their fall was the harbinger of the overthrow or limitation of the rest. In 1781, Joseph II. prohibited all dependence of the orders in his empire on foreign superiors, viz. the general and Rome; abolished all immunities, and placed the religious of every description under episcopal superintendence; he removed the foreigners among them; prohibited the admission of novices for an indefinite period; and soon after decreed the entire abolition of those orders which led a life of solitary meditation. Thus were extinguished the Trinitarians, Servites, Carthusians, and Paulanites, and nearly all the female orders in the hereditary states of Austria. Soon after, all the remaining orders, except the Benedictines of the Molk congregation, the Piarists, the Ursuline nuns, and the Brethren and Sisters of Mercy, were limited to a certain number of members to every monastery, and forbidden to admit novices for the future. Thus they were condemned to gradual decay, so that the number of monasteries in Austria, which had diminished in ten years, from 882 to 469, was doomed to go on diminishing continually from year to year. The late emperor, however, permitted the orders which devoted themselves in any way to the common good to admit novices. The Franciscans flourish, most of all, in Hungary, where the schools, in many places, are wholly under their care. In Bohemia, also, the Capuchins, Augustines, Præmonstratenses, and Knights of the Cross, maintain their monasteries by constant additions. In 1790, the national assembly of France abolished all religious orders, and assigned scanty pensions to the existing 18,000 monks and 30,000 nuns; but the pensions were soon discontinued. In Germany, where the doom of secularization, in 1803, fell on nearly all the religious establishments and monasteries, the orders declined of themselves. In the time of Napoleon, this useful arrangement was extended to Italy and Poland. In 1810, the king of Prussia declared the monasteries in his states abolished, in order to increase the provision for schools; and no monasteries were to be found in Europe, except in Russia (which tolerates the usages of all religions,) in Austria, Sardinia, Sicily, Ireland, Spain, and Portugal, when Pius VII., in 1814, decreed the restoration of all religious orders. In truth, this proclamation affected only the States of the Church, where the pope uses the religious orders to superintend public instruction and charities to the poor, for which, with his shattered finances, he is himself unable to provide. The courts of Madrid, Turin, Modena, Lucca, and Naples, followed the example of the pope, and have begun to reinstate, in their ancient possessions, the religious who had been displaced by institutions of common utility. The latest concordats of the pope with Naples, France, and Bavaria, contained stipulations in favour of the religious orders. In Bavaria, where the monasteries were abolished, some have been restored. The period of religious orders, however, is past, both in France and Germany; for in these countries the advancing spirit of the age renders all monastic institutions unnecessary; and such establishments, almost everywhere, want money and popular favour. The latest order (established by Leo XII. in 1826,) is the congregation of the Blessed Virgin Mary; and its regulations, besides the three regular vows, prescribe a fourth, viz., continuance in the connexion.—See *Histoire des Ordres monastiques et militaires*, by Heyot (Paris, 1714, 8 vols. 4to; *nouvelle edition revue et corrigée, ornée de* 812 *figures*, 1792, 8 vols., 4to;) *Pragmat Geschichte der Vornehrmsten Monchsorden*, with a preface by Walch (Leipsic, 1774—83, 10 vols.,) by Crome, rector of Eimbeck.

ORDINANCE OF THE MARINE. See *Commercial Law*.

ORDINANCES OF BILBAO is a code of commercial laws, which, for more than three centuries, was generally adopted by all the commercial tribunals of the monarchy of Spain, until it became the law of the land, and was, as such, incorporated in the compilations (*recopilaciones*) of laws. This long career of authority was terminated, however, May 30, 1829, by the promulgation of a new and far more extensive code of commercial laws, which has been put in operation in all the territories, acknowledging the government of the court of Madrid. The ancient code is therefore confined to the Spanish American republics, which have been, as yet, contented with the general laws of the mother country up to the time of their separation, in so far as they have not been modified by their independent legislatures. It may be expected, however, that the new Spanish code will be received before long by the new republics. The ordinances of Bilbao were originally compiled by the corporation of merchants of the city of Burgos. It is not apparent that any foreign code of laws was used on its formation, but, on the contrary, its features are so truly Spanish, so grave, circumstantial, and cautious, that we may be permitted to conjecture, in the absence of any historical proof to the contrary, that its enactments are mostly founded on the experience and commercial knowledge of that distinguished body of merchants, which received the sanction of Ferdinand and Isabella, by a royal rescript of July 21, 1494. The city of Bilbao was afterwards allowed on its own solicitation, to have the benefit of its provisions, by a decree of queen Juana, dated Seville, in the year 1511, which allowed the corporation of that town to exercise jurisdiction in commercial affairs by means of a tribunal established by itself. The ordinances are divided into twenty-nine chapters, of which the first eight, including the royal charter of queen Juana, treat exclusively of the organization of the corporation and the commercial tribunal, its internal regulation and duties: the following sixteen relate to the qualifications of merchants, their various relations as partners, commission merchants, and general dealers, the laws of exchange, bonds and letters of credit, the laws of bankruptcy, the duties of brokers, supercargoes, the chartering of vessels, ship's papers, shipwrecks, and salvage, average, insurance, and the allegations of captains and mariners: the last five, from the 25th to the 29th, relate chiefly to the duties of pilots, lightermen, shipbuilders, and carpenters, with some local regulations of great minuteness.

ORDINARIUS. For the *professores ordinarii* in German universities, see the article *Universities*.

ORDINARY, in the common and canon law; one who has ordinary or immediate jurisdiction in ecclesiastical matters. In England, the bishop of the diocese is commonly the ordinary. The ordinary of assizes and sessions was formerly a deputy of the bishop, appointed to give malefactors the neck-verse (i. e. the verse which was read by a party to entitle him to the benefit of clergy.) The ordinary of Newgate is one who attends on condemned culprits, to prepare them for death. The establishment of persons employed by government to take charge of ships of war laid up in harbours, is called the *ordinary*; hence a ship laid up under the care of the master attendant, is said to be *in ordinary*. A physician or chaplain statedly attending in actual service, is called a physician or chaplain *in ordinary*. For the *professores ordinarii* in the German universities, see *Universities*.

ORDINATE. See *Parabola*.

ORDINATION; the consecration of a Christian minister or priest for his office, his admission into the number of the clergy. With many Protestant sects, ordination is merely a solemn act, by which the person to be ordained is publicly declared by the ordainers fit for preaching, and to be henceforward one of the clergy or ministry of their sect; the ordainers accompanying the act by prayers, and by expounding to the candidate for ordination the sacred duties which he undertakes. The English church considers ordination as a real consecration, the power of communicating which has descended from Christ through the apostles and bishops; and the American episcopal church therefore sent to England, after the revolution, to obtain the consecration of bishops, through whom the power of ordination is descended to the episcopal clergy of the United States. (See *England, Church of*; close of the article.) For ordination in the English church, subscription to the thirty-nine articles, acknowledgment of the temporal and spiritual supremacy of the king, and the declaration that the Book of Common Prayer contains nothing contrary to Scripture, are requisite. The ceremony of ordination is performed by the bishop by the imposition of hands on the person to be ordained. In the English church, and in most Protestant countries, where the church is connected with the state, ordination is a requisite to preaching; but in some sects ordination is not necessary for that purpose, although it is considered proper, previous to the administration of the sacraments by the preacher. The Catholic church, both Roman and Greek, has distinguished, ever since the third century, eight orders (*ordines*,) each of which is conferred with peculiar solemnities. The lower or petty orders of the ancient church were the *ostiarii*, or door-keepers; the sacristan (sexton,) who tolled the bell, opened the church, &c.; the *lectores*, or readers, who read passages of the Bible to the people; the *exorcists*, whose office it was to drive out evil spirits, and to assist in the ceremony of baptism, by reading the formula of exorcism; and the *acolythi* (q. v.). These four minor orders are generally conferred on the same day by the bishop. They are not consecrations, do not confer a spiritual dignity, nor require celibacy; but it is necessary to have passed through them in order to obtain the others. The higher orders require celibacy, authorize the wearing of the sacred vestments and the tonsure, and stamp the individual with an indelible character (*character indelibilis*.) The lowest of these is the subdeaconship, the duties of which are the care of the sacred vessels, the decoration of the altar, &c., and the chanting of the epistle to the society. The deacons are one degree higher, who serve during mass (distribute the wafers,) administer baptism, preach, chant the gospel to the people, and are distinguished from the subdeacons by wearing the *stola* and *dalmatica* (q. v.). Still higher are the priests or presbyters, who administer all the sacraments except confirmation and ordination, and wear mass vestments when celebrating mass. These three degrees are also usually conferred by the bishop on one day. The highest degree is the episcopal ordination, which authorizes the bishop to administer the sacraments of confirmation and ordination. (See *Bishops*.) Bishops are consecrated by archbishops, and the latter do not receive any new consecration, but are installed archbishops by receiving the *pallium* from the pope. The Catholic dogma of ordination is founded on John xx. 21 and 22, where Christ says to the apostles, "As my father hath sent me, even so send I you. And when he had said this, he breathed on them, and said unto them, Receive ye the Holy Ghost." The spiritual power of ordination it considers as descended from the apostles through the bishops.

ORDNANCE. See *Cannon*, *Artillery*, *Gunnery*, *Howitzers*, *Mortars*.

OREADS. See *Nymphs*.

OREGON; the name by which that portion of the territory of the United States of America which lies west of the Rocky mountains, is commonly known. It forms a distinct geographical region, but has no independent official existence. Its western and eastern limits are clearly defined by the Rocky mountains and the Pacific ocean, its southern by the boundary line between Spain and the United States, being on the parallel of 42° from the mountains to the ocean. The northern boundary is unsettled, but is often laid down on the maps as formed by the parallel of 54° north, because, by the convention of 1824, between Russia and the United States, it was agreed that the subjects of the former should form no settlements to the south of that parallel. This region is claimed by the United States on the ground of priority of discovery, examination, and occupation. It was discovered by an American, Gray, who entered the mouth of the Columbia (q. v.), in 1790; examined by Lewis and Clarke, by order of the government in 1805; and, in 1811, a settlement was formed by American citizens at the mouth of the Columbia, called *Astoria*, which was taken by the British in 1813. The British government denies the justice of this claim on the part of the United States, north of 42°; and, by a convention made in 1818 (renewed in 1827) between the parties, it was agreed that all the territory west of the Rocky mountains should be open for the space of ten years to both. The breadth of this region, from east to west, is from ten to fifteen degrees of longitude (400 to 650 miles ;) the interior is mountainous, but the soil in general is fertile, and the climate agreeable, being much milder than that of the same parallels east of the mountains. The principal river is the Columbia.

OREGON RIVER. See *Columbia River*.

ORELLANA, Francis; a Spanish officer, who is regarded as the discoverer of the great river of the Amazons, in South America. This river is sometimes called after his name.

ORES. Metals, when found in a state of combination with other substances, have the name of *ores*. They are in general deposited in veins of various thickness, and at various depths in the earth. The mode of obtaining them is to penetrate from the surface of the earth to the vein, and then to follow it in whatever direction it may lie. The hollow places thus formed are called *mines*, and the men employed in them are denominated *miners*. When the veins are at a great depth, or extend to any considerable distance beneath the surface of the earth, it is necessary, at intervals, to make openings, or *shafts*, to the surface, for the admission and circulation of air; and also to draw off the water, which collects at the bottom, by means of drains, pumps, or steam-engines, as the situation or circumstances require. After the metallic ores are drawn from the mine, they, in general, go through several processes before they are in a state fit for use. Some of these are first washed in running water, to clean them from loose, earthy particles. They are then piled together with combustible substances, and burned, or roasted, for the purpose of ridding them of the sulphur or arsenic with which they may happen to be combined, and which rises from them in a state of fume or smoke. Thus having been freed from impurities, they undergo the operation of melting, in furnaces constructed according to the nature of the respective metals, or the uses to which they are subsequently applied. See *Mine*; also *Iron*, where the treatment of iron ores is particularly described.

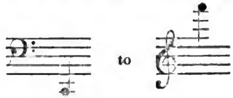
ORESTES, son of Agamemnon and of Clytemnestra, the hero of several Greek tragedies, in which he is represented as the deliverer of his sister, and the avenger of his father, by becoming the murderer of his mother. Of the pieces of which his history was the subject, there remain the *Choëphori* and the *Eumenides* of Æschylus, the *Electra* of Sophocles, and the *Orestes* and *Iphigenia in Tauris* of Euripides. Orestes, saved by his tutor, with the assistance of Electra, from the fate of his father, was brought up in the house of his uncle Strophius, prince of Phocis, and formed with his son Pylades that intimate friendship which has become proverbial. Called upon by the Delphian god to avenge his father, he hastens back to Mycenæ. To conceal himself, he has recourse to artifice. His tutor and Pylades appear with an urn, which they pretend contains the ashes of Orestes. Clytemnestra hears the news of her son's death with a joy which she can hardly conceal; but she soon falls under his dagger. Ægisthus undergoes a similar fate. But, according to the notions of the Greeks, the murderer of his mother became a prey to the Eumenides. These terrible goddesses unrelentingly pursue the unhappy prince, and at last drive him to madness. He flies to Delphi, still pursued by the avenging deities; but an oracle of the god informs him that his torments will cease when he shall have carried back the statue of Diana from Tauris to Argos. Upon this information Orestes sails with Pylades to Tauria. His sister Iphigenia, an unknown stranger, was here living as a priestess of Diana. An old law commanded that every stranger should be sacrificed to the goddess. Iphigenia was about to offer up her brother; but a recognition takes place, they seize the image of Diana, and, together with Pylades, come to Argos. The infernal deities were now appeased. Married to Hermione, daughter of Menelaus, Orestes ruled over his paternal kingdom of Mycenæ, and over Argos, upon the death of its king, who left no heirs. An oracle induced him to travel into Arcadia, where he lived in the city of Orestia, and died at a very advanced age, from the bite of a snake. His bones were afterwards carried to Sparta.

ORFORD, Earl of. See the two articles *Walpole*.

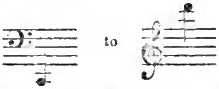
ORGAL, or ARGAL. See *Argal*.

ORGAN. This word, as applied to natural bodies, signifies a part, or, if we may so say, a group of parts of an organized body, that is, such a body as is endowed with an inherent life, and power of activity, and reproduction. The precise idea of organ depends upon the idea of life, the limits of which cannot be accurately defined. The point at which life ceases is not agreed upon. All allow that plants live. Some philosophers even attribute life to crystals, since they follow inherent laws; but, generally speaking, the expression "organic world" comprises only the vegetable and animal world. Man stands on the highest step of organic life among all the beings with which we are acquainted; he moves with liberty and consciousness; his organization is the most complicate, delicate, and perfect. The various gradations of organized being, from man, through animals, plants, and down to crystals, furnish a most curious and interesting subject of study. The word *organ*, as applied to a group of parts, denotes that they have a particular office, and, in some considerable degree, an independent action, as when we speak of organs of taste, hearing, digestion, &c.

ORGAN (from the Greek *οργανον*); a musical instrument, which contains, within a case, a number of pipes, harmonically arranged, into which wind is driven by bellows (hence also the name *wind-organ*, *οργανον πνευματικον*,) and which yield tones when the player touches the keys connected with them. The chief parts of an organ are the pipes, which are of metal (tin and lead) or wood, whose length and diameter determine the depth or height of the tone (they are sometimes four, eight, sixteen feet long;) the registers or stops, by which the entrance of wind into a pipe is regulated; the manual or key-board, consisting of one or several rows of keys; the pedal, the bellows, the wind-trunk, wind-chest, sound-boards, &c. The greatest compass of the manual is



and that of the pedal



Most organs, however, only extend in the manual to C. The advantage which the organ, like every other instrument with a key-board, has, viz. that melody and harmony can be produced at the same time, united with the quantity and variety of its voices, makes it the most complete of musical instruments, and gives it a fulness and magnificence of harmony, which is sufficient to compensate for the want of those fine gradations of strength and delicacy of tone which the violinist, for instance, can produce, and which the Frenchman Grenie tried, in 1811, to give to the organ, by his *Orgue expressive*. Besides, the organ has the advantage, that each tone may be continued in equal strength for any length of time, so that it is peculiarly proper for the grave, solemn, *legato* style, as in church music, and for the most complicated harmonies; but for this very reason it requires a player who is familiar with the character and compass of harmony, and possesses the skill to arrange with rapidity his musical ideas, and to choose the best means for their execution. A good player on the piano, therefore, is not necessarily equally skilful on the organ, and the very mode of fingering differs much, on account of the vastly different character of the instruments. An *organ*, when complete, is of threefold construction, and furnished with three sets of keys; one for what is called the *great organ*, and which is the middle set; a second (or lower set) for the *choir organ;* and a third (or upper set) for the *swell*. In the *great organ*, the principal stops are the two *diapasons*, the *principal*, the *twelfth*, the *fifteenth*, the *sesquialtera*, the *mixture*, or *furniture*, the *trumpet*, the *clarion*, and the *cornet*. The *choir organ* usually contains the *stopt diapason*, the *dulciana*, the *principal*, the *flute*, the *twelfth*, the *bassoon*, and the *vox humana*. The *swell* comprises the two *diapasons*, the *principal*, the *hautboy*, *trumpet*, and *cornet*. Besides the *complete organ*, there are other organs of less size, and more limited power, adapted to church, chapel, and chamber use. Some persons, particularly Jews, suppose, but without foundation, that the organ was used even in the temple of Solomon. Some derive its origin from the bagpipe; others, with more probability, from an instrument of the Greeks, though a very imperfect one,—the *water-organ*,—as it is known that the first organs used in Italy came thither from the Greek empire. It is said that pope Vitellianus (died 671) caused organs to be set up in some Roman churches in the seventh century. (See *Cecilia*.) Organs were at first portable. The organs now in use are considered an invention of the Germans; but respecting the time of this invention opinions differ. It is said by some, that, as early as 1298, the cathedral of Strasburg lost an organ by fire, which seems not to have been a "water-organ." Others assert, that the first organ of the kind now in use was built in the year 1312, by a German at Venice. It is certain that the use of organs was not common before the fourteenth century. At the beginning, the instrument was very imperfect; it was useful only in fixing the pitch of the voice parts, which was effected by touching, or rather pressing down, a key two inches wide, and pretty thick, when a hymn was sung. The first organs seldom had more than two keys, which were so large and difficult to be moved, that probably this circumstance gave rise to the expression "to thump the organ." They were portable, and had, perhaps, no register. The keys in time became smaller, and between the diatonic tones the semitones were inserted. The left hand, also, was occupied by the addition of a new key-board. In 1444, H. Drossdorf of Mayence built a great organ, with a pedal. According to others, Bernhard, a German, organist to the doge of Venice, built the first organ with a pedal, between the years 1470 and 1480. The largest organ known till the end of the fifteenth century, was that in the church of St Blasius, at Brunswick, built by H. Kranz, in 1499. Improvements of the organ succeeded quickly in the sixteenth century; the division of all the pipes into different stops was now invented, and the tone of the instrument was adapted to the tone of the choir. The bellows were particularly improved as, till then, twenty to twenty-four pair had often existed in one organ, requiring from ten to twelve men to tread them. But the present degree of perfection could not be obtained until Christian Forner had invented, in the seventeenth century, the *wind-chest*, by which an equal pressure of wind can be obtained in all the bellows. The largest organ is that in St Peter's church in Rome: it has a hundred stops. The great organ in Gorlitz (built in 1703) has fifty-seven stops and 3270 sounding pipes. The organ in the minster of Strasburg has 2136 pipes; that at Ulm, in Suabia, over 3000 pipes. In Rothenburg, on the Tauber, and in Halberstadt, there are organs on which three players may perform at the same time. The organ in the church of Mary Magdalen, at Breslau, has 3342 pipes. The largest metallic pipe weighs three and a half cwts., is twelve and a half ells long, and fourteen inches in diameter. Vogler has attracted much notice by his system for simplifying the construction of organs. An organ of pasteboard, at Saintes, built by father Julian, produces agreeable tones. In Paris, some time ago, an organ was built of playing cards. We have seen an instrument with a key-board like that of an organ, the tones of which, however, were produced by the friction of wood; and the newspapers lately announced the invention of an instrument which produces agreeable sounds by the striking together of flints, made by M. Backstein of Cassel, who calls this instrument *saxamelodicon*.

The *hand* or *barrel organs* consist of a movable, turning cylinder, called a *barrel*, on which, by means of wires, pins, and staples, are set the tunes it is intended to perform. These pins and staples, by the revolution of the barrel, act upon the keys within, and give admission to the wind from the bellows to the pipes. The *hand-organ* is generally portable, and so contrived that the same action of the hand which turns the barrel, gives motion to the bellows. For *water-organ*, see *Hydraulicon*.

ORGANIC LAWS is the name given in France, and also in Germany, to such laws as directly affect the fundamental political organization of a country. Thus the law which changed the provisions in the constitution of the United States respecting the election of the president and vice-president (see *Election*), would be called by the French an *organic law;* and thus the *senatus consulta*, which declared Bonaparte consul for life, and afterwards emperor, were called *organic senatus-consulta*. However, the French apply this term not only to those laws, which, at least in many cases, would be called by us *reforms of the constitution*, but also to every law which, as the *Encyclopédie Moderne* expresses it, is the application of the theory contained in the fundamental law as charter. The words are these: *La loi fondamentale quel que soit son nom, n'est qu'une proclamation de principes. Les lois organiques sont l'application de cette théorie. Le principe est dans la charte, la garantie dans la loi organique.* The fundamental law, however called, is but a proclamation of principles. Organic laws are the application of this theory. The principle is in the charter, the application in the organic law.

ORGANIC REMAINS; those animal and vegetable substances which are contained in rocky strata, or found loose in the earth. The study of them has sometimes been denominated *oryctology*. Xenophanes, more than 400 years before Christ, was led to the belief of the eternity of the universe, by discovering the remains of different marine animals imbedded in rocks and under the surface of the earth. Herodotus ascertained the existence of fossil shells in the mountains of Egypt, and was thereby induced to believe that the sea must have once covered those parts. In the pyramids of Egypt, mentioned by this author, and which were built at so early a period that no satisfactory accounts could be derived from tradition concerning them, the stones were found to contain the remains of marine animals, and particularly of such as exist no longer in a recent state, and differ essentially from all known animals. These were supposed by Strabo, who saw the fragments of these stones lying around the pyramids, to be the petrified remains of the lentils which had been used for food by the workmen. In the works of Pliny many fossil bodies are mentioned, particularly the bucardia, resembling an ox's heart, but which was, doubtless, a cast formed in a bivalve shell; glossopetra, bearing the form of a tongue, and supposed to fall from the moon when in its wane; hammites, resembling the spawn of a fish; horns of ammon, resembling in form the ram's horn; lepidotes, like the scales of fishes; meionites, bearing a resemblance to the seeds of the poppy; brontiæ, looking like the head of a tortoise; spongites, which resembled sponges; and phycites, sea weeds and rushes. Modern investigations have brought these remains to light, as existing in the greatest variety of forms, in immense quantity, and with the widest possible distribution. The lowest and most level parts of the earth, when penetrated to a very great depth, exhibit strata containing innumerable marine productions. Similar formations compose hills, and even mountains, in which the shells are so numerous as to constitute the main body of the rock; and they are often in such a perfect state of preservation, that the smallest of them retain their most delicate processes; even the colours which decorated their external surface are found nearly in their original beauty; and, in innumerable instances, shells have been discovered, exhibiting all those tints and reflections, which are common to the pearlaceous species. Every part of the globe, of any considerable extent, presents the same phenomenon; and, what is at length perfectly established respecting these productions, they differ in specific, and often in generic resemblances, from the shells of the present day, and the differences between the extinct and living shells increase in proportion as we descend through the successive series of deposits that overspread the surface of the earth.

But it was reserved to Cuvier, the greatest of comparative anatomists, to throw a clear light over these interesting remains; who, by much time and high talent devoted to the investigation, fully illustrated their organization, and the place which they naturally occupied in the scale of being. That great adept, on investigating this obscure subject, clearly demonstrated, that from the character of a single limb, and even a tooth or bone, the form, proportions, and articulation of the other bones, and stature of the whole animal, may be inferred. This general law holds good among existing animals; and from the bones, an expert anatomist may not only decide the general form of an entire fossil skeleton, but also the character of the muscles by which it was invested, and by which every bone was moved; and even the habits, haunts, food, and general mode of life of those beings which existed on the earth's surface and in its waters, prior to the creation of man.

"Concurrent with this rapid extension of our knowledge of the comparative anatomy," says Buckland, "of the ancient inhabitants of the earth, has been the attention paid to fossil conchology,—a subject of vast importance in investigating the records of the changes that have occurred upon our globe."

And no less necessary is a knowledge of the plants and vegetation which coexisted with these ancient animals. This kingdom of nature has, however, till lately, been greatly neglected. Brongniart has done much towards forwarding this interesting topic; and the present investigations of professor Linley, and other expert botanists, are likely to establish correct data respecting fossil vegetables. Mr William Nicol of Edinburgh, has lately made some admirable discoveries on the structure of fossil trees, of which he has produced some fine sections, and by comparing them with recent woods, has completely identified their structure, and been able to place each fossil in its true position in the vegetable kingdom. A full account of these discoveries is to be found in Witham's work on The internal structure of Fossil Vegetables.

Since the commencement of the present century, very great progress has been made in modern geography, which may be traced to the more precise knowledge of Organic Remains; for we find certain families of animals pervading strata of every age, and possessing the same generic forms, which are to be found among existing animals. There are, however, other families, both animal and vegetable, which are confined to particular formations, where whole groups of these have been annihilated, and have been replaced by others bearing widely different characters; and the changes of genera and species are still more frequent. Zoology and botany have therefore become indispensable studies to the geologist. Before the importance of organic bodies in discriminating the different formations was appreciated, it was considered that a knowledge of mineralogy was sufficient; but the mineral character and composition of which the strata of the earth's surface are composed, very inadequately assist us in our investigations, for we find a similar succession of beds of sandstone, clay, and limestone, irregularly repeated, not only in different, but also in the same formations. Thus the same formation, which constitutes the argillaceous deposits of the London clay in England, exhibits at Paris the sand and freestone, of what is termed the calcaire grossier; whilst the resemblance of their organic remains proves their deposition to have been of the same epoch, notwithstanding the difference in the character of their mineral ingredients.

"The secrets of nature, that are revealed to us by the history of Fossil Organic Remains, form perhaps the most striking results at which we arrive from the study of geology. It must appear most incredible to those who have not minutely attended to natural phenomena, that the microscopic examination of a mass of rude and lifeless limestone, should often disclose the curious fact, that large proportions of its substance have once formed parts of living bodies. It is surprising to consider, that the walls of our houses are sometimes composed of little else than comminuted shells, that were once the domicile of other animals, at the bottom of ancient seas and lakes."

It has been lately ascertained by Mr Ehrenberg, that the rocks of homogeneous appearance, which are not very hard, friable, even fissile, entirely formed of silex, and which are known by the name of Tripoli, more or less solid, are entirely composed of the exuviæ, or rather of the perfectly ascertained skeletons of infusorial animals of the family *Bacillariæ*, and of the genera, *Gomphonema*, *Synedra*, *Gallonella*, &c. Professor Jameson and Mr Nicol have examined carefully, characteristic specimens of polishing slate, and found in them numerous remains of lacustrine infusoria, thus confirming the discovery of Ehrenberg, in so far as applies to the Polier-slate.

We may inform those who have not made geology a study, that the word *Formations* is understood to apply to certain groups of strata which have been associated together for the sake of ready and simple classification, and of avoiding the perplexity otherwise arising from their numerous subordinate beds. But for this comprehensive arrangement, it would be difficult to distinguish, with sufficient precision, the separate members of the secondary strata. As each formation is in general made up of several members, so also the latter are composed of an infinite number of beds; and those beds, again, of innumerable finer lamina; but the whole series being found to possess some common character, some obvious relations, or some general similarity in organic accompaniments, or circumstances of position, they are appropriately classed under one common denomination.

It is in strata of the TRANSITION series that the first remains of organized beings begin to be found, but these are of the most simple construction in their parts, especially in the inferior regions of this series. But we find in them the remains of the four established divisions of the animal kingdom; viz. *Vertebrata*, *Mollusca*, *Articulata*, and *Radiata*; thus proving these great divisions of animals to have been coeval with the beginning of organic life on this globe. But the highest degree of vertebral animals, which have yet been found in the series, is fishes.

In the SECONDARY strata, the only terrestrial animals which have yet been ascertained, are some small marsupial quadrupeds allied to the opossums; these are sparingly to be met with in the oolite formation at Stonefield, near Oxford. Besides these, Cuvier discovered two other small species in the gypsum of the Tertiary formations of the Paris basin, thus proving that animals of this order were, contrary to what was supposed, in reality antecedent to all other mammifera on our globe.

The secondary strata present us with a series of Saurian reptiles, principally of a gigantic size; many of them marine; others were amphibious, while a third series were terrestrial, occupying savannas and jungles.

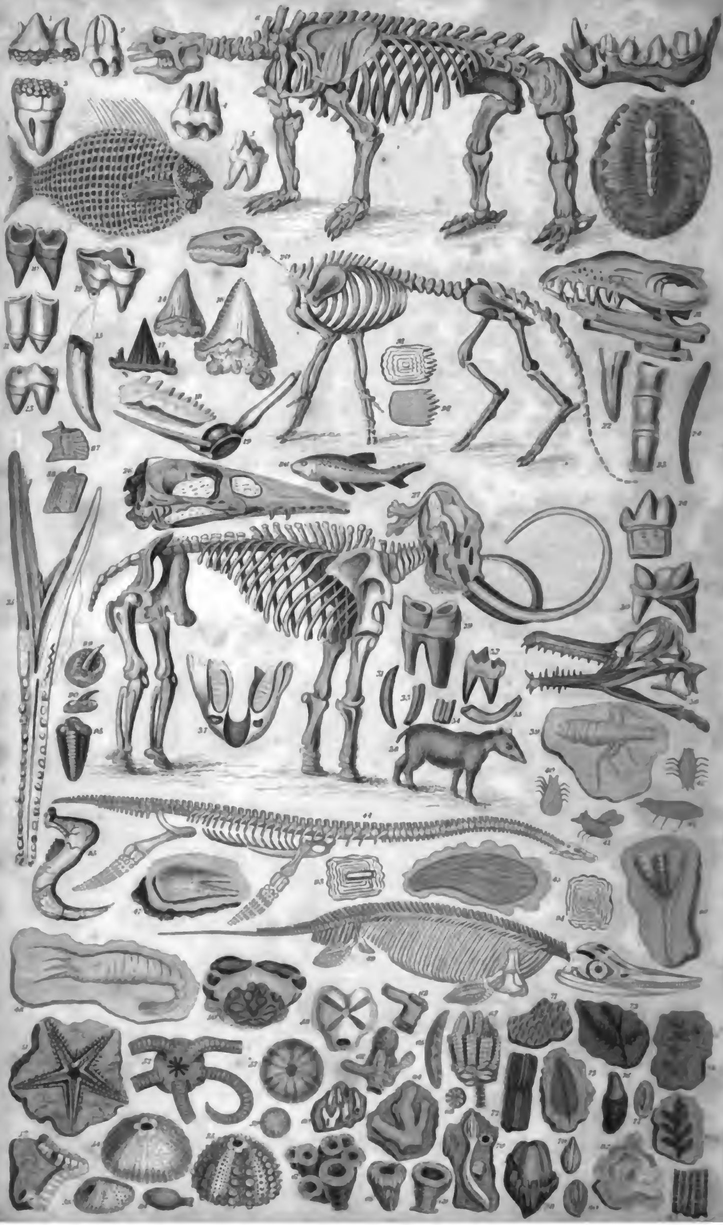
In the TERTIARY series we find that the fossil remains, of both animals and vegetables, are much more numerous, and greatly more perfect in their organization, and bring us down, by a natural transition, to those of our own times. Cuvier and Brongniart were the first who made us acquainted with that important portion of the tertiary series, which form the deposits above the chalk at Montmartre, near Paris. This at first was supposed to be peculiar to that locality, but which later investigations have proved to stretch extensively over the whole of our globe, and presenting us with incontestable evidence, of not less than four distinct periods of succession, indicated by changes in the nature of the organic remains imbedded in those strata. Every one of these periods evinces an increasing provision for the spread of animal existence, from the immense quantities of bones and shells found in the strata of these epochs.

Deshayes and Lyell have considered it necessary to institute four divisions of the formations of the tertiary series. The first of which they term the EOCENE, signifying the *dawn* of the existing state of animal creation. The London clay and calcaire grossier of Paris are examples of the older tertiary formations, and contain but a very few species of shells, of which we have living examples. The second appellation is the MIOCENE, in which are included formations of strata containing shells, the minor proportion of which consists of recent species: for example, the shells of Vienna, Turin, and Bourdeaux. The third and fourth are the older and newer PLIOCENE, which, taken in conjunction, contain shells, nearly the whole of which are to be met with in a recent condition, but more abundantly in those of the newer Pliocene; in this division are the later formations of Sicily, Tuscany, and Ischia; while the subapennine marine formations, and English crag, are included in the older Pliocene. These we have enumerated under their proper head. Alternating with these four great marine formations, there intervenes a fourfold series of strata, containing shells which must have inhabited fresh water, associated with numerous bones of terrestrial and aquatic mammalia. The construction of these bones and form of the shells clearly indicate, that their functions, in a living state, must have been exercised in a manner similar to those now existing.

Having thus given a brief review of the progress of discovery in Fossil Organic Remains, we shall now discuss the subject in a systematic form, following the descending scale of being, as in our other treatises.

Many species of animals have existed on our globe of which we have now living examples. Many controversies have arisen, whether species have existed since the first formation of animals, or whether they were more simply formed at first, and have gradually improved by reproduction, and assumed more enlarged

ORGANIC REMAINS



and more perfect forms, with new specific distinctions; we look upon the last theory as absurd, and with Mr Lyell, we are distinctly of opinion, "that species have a real existence in nature, and that each was endowed, at the time of its creation, with the attributes and organization by which it is now distinguished," whether in a fossil or recent state; and M. de la Beche says, "there can be no doubt that many plants can adapt themselves to altered conditions, and many animals accommodate themselves to different climates; but when we view the subject generally, and allow full importance to numerous exceptions, terrestrial plants and animals seem intended to fill the situations they occupy, as these were fitted for them; they appear created as the conditions arose, the latter not causing a modification in previously existing forms productive of new species."

Although the whole species of Fossil Organic Remains, which have been found in the older formations, are specifically distinct from existing individuals, yet none of their characters are such as to require the institution of a new class for their reception; for although many of them differ in their generic distinctions, yet the same general plan of structure connects them with one or other of these classes, which, we have said, seem to have been at first created.

CLASS I.

FOSSIL MAMMALIA.

ORDER I.—BIMANA, MAN.

We beg to refer to the characters of this class and its orders, under the article Mammalia.

In all the formations, there has not been a single case discovered of the remains of the human race; and we must therefore conclude, that the numerous examples which we have of animal remains in the earth's strata, belong to races of beings which existed and died before the creation of man.

There is one example of the remains of man being found imbedded in a rock, which, however, is no proof against the fact we have just stated. There is a number of scattered human bones which were detected in a limestone rock, on the shore of the island of Guadaloupe. But we have no reason for supposing these bones to be of high antiquity, because the rock in which they occurred is composed of consolidated sand, and contains shells of species now inhabiting the surrounding sea and land, as well as fragments of pottery, arrows, and hatchets of stone. An entire skeleton was found at one spot, which is now preserved in the British museum. This was laid out in the usual position of burial; and another was found in the softer sandstone, and appeared to have been buried in the sitting posture, customary among the Caribs. The bodies thus differently interred may have belonged to two different tribes. General Ernouf also explains the occurrence of the scattered bones, by reference to a tradition of a battle and massacre on this spot, of a tribe of Gallibis by the Caribs, about the year 1710. These scattered bones of the massacred Gallibis were probably covered, by the action of the sea, with sand, which soon after became converted into solid stone. Examples of stone of this kind being formed in a very few years, are very frequent. On the west coast of Ireland, near Kilenny harbour, a sand bank, which is surrounded by the sea at high water, is at this time employed by the natives as a place of interment.

There have also been found in caverns in the vicinity of Liege, various bones of the human species, supposed by some to have belonged to individuals whose existence was coeval with the bones of other mammalia, discovered in the same locality. These human bones, however, have been seen, and carefully examined, by professor Buckland, and he is distinctly of opinion that they do not belong to a date by any means so ancient as those of the quadrupeds. Associated with these human bones are rudely formed flint knives, as well as other implements of bone and flint, which must have been left there by uncivilized tribes, who have inhabited the caverns. The human bones, besides, are in a much better state of preservation than the animal remains. We may, therefore, safely affirm, that man has not yet been discovered in a true fossil state.

ORDER II.—QUADRUMANA, APES AND MONKEYS.

Not a single species of quadrumanous animals has been found in a fossil state.

ORDER III.—CARNASSIERS, BATS, &c.

Bats have been found in the gypsum of the Paris basin.

ORDER IV.—INSECTIVORA.

FAMILY II.—CARNIVORA.

In this family there have been discovered a large wolf, differing from any existing species; a fox, a large species of coati (of the genus Nasua) found only in a recent state in the warm climates of America; a racoon and gennet. All these have also been detected in the gypsum of Paris.

In the cave at Kirkdale, professor Buckland discovered the bones of hyænas, tigers, and bears. All the bones and teeth of these fossil animals differ materially from the existing races. We have given examples of some of these. In plate 65, fig. 1, is the hindmost grinder of the upper jaw of the bear, fig. 2 the foremost upper grinder, fig. 3 the hindmost grinder of the lower jaw, fig. 4 the middle upper grinder, and fig. 5 the foremost lower one. Fig. 7 the lower jaw of the hyæna. This species must have been very numerous, for it is found not only in the caverns, but also in the alluvial strata, associated with bones of extinct elephants. A species of hyæna, now extinct, must also have existed in different parts of Germany, as bones of it have been found in the cave of Gaylenreuth, in the sand hills near Eichstadt, and also in Baumann's Hohle, and in other spots, as well as in France. Fig. 30 is another fossil tooth of the hyæna, probably of a different species from those figured above. Fig. 28 is the molar tooth of a wolf, fig. 31 is the tusk of a fox, and fig. 32 is the great molar tooth of the same; fig. 29 is the molar tooth of a tiger. The supposed antediluvian fissures of rocks, chiefly in the mountain limestone, red sand-stone, and oolite, are the principal receptacles where these remains are found.

ORDER V.—MARSUPIALIA, OPOSSUMS, &c.

A small opossum; nearly allied to the existing North American species, has been detected in the gypsum of Paris. The fossil genera are very numerous of this order.

ORDER VI.—RODENTIA, BEAVERS, &c.

Animals of this order have been ascertained in the Pliocene series, as well as in the preceding period. Pl. 65, fig. 33, the molar teeth of a rabbit; fig. 34 the molar tooth of a water-rat; and fig. 35, the incisors of the same.

ORDER VII.—EDENTATA.

One of the most remarkable animals of this order is the great Megathurium (M. Cuvieri) pl. 65, fig. 6. See Mammalia, page 650, and Megathurium.

ORDER VIII.—PACHYDERMATA.

In the Calcaire Grossier of Paris, there are some examples of the occurrence of the remains of Palæotherium; but, in the first great fresh water formations of the Eocene period, there have been discovered nearly fifty extinct species of mammalia, most of which belong to the Pachydermata, and are of the orders Palæotherium, Anoplotherium, Lophiodon, Anthracotherium, Cheroptomus, and Adopis. Pl. 65, fig. 38. The little Palæotherium, pl. 65, fig. 12, exhibits the outer surface of the fourth molar tooth of the lower jaw of the Palæotherium; fig. 13 the inner surface. Pl. 52, fig. 43, the greater Anoplotherium, as it is supposed to have been with its muscles; and pl. 65, fig. 20, represents the skeleton of the common species (*A. Commune*); fig. 10 the antepenultimate lower grinder of the Anoplotherium; fig. 11 the grinder which stands before the foregoing. We have given the generic characters of these in Mammalia, page 651.

GENUS LOPHIODON.

The animals of this genus are nearly allied to the tapier and rhinoceros, and in some points to the hippopotamus, and are nearly connected with the Palæotherium and Anoplotherium. Fifteen species of this genus have been ascertained.

GENUS ANTHRACOTHERIUM.

These animals are so designated, from having been first met with in the Tertiary coal, or lignite of Cadibona, in Liguria. Some of the species approximate closely to the hog, and others are nearly allied to the hippopotamus.

GENUS CHEROPTOMUS.

This animal was most nearly connected with the hogs, and somewhat approaching to the Babiroussa, forming a connecting link between the Anoplotherium and Peccary, the *Dicotyles* of Cuvier.

GENUS ADOPIS.

This animal must have been formed nearly like the hedgehog, but thrice the size of that creature, and appears to have been the connecting link between the Pachydermata and the Insectivorous Carnivora.

GENUS MASTODON.

See Mammalia and Mastodon. Pl. 52, fig. 42.

GENUS ELEPHAS.

See Mammalia and Elephant. Pl. 65, fig. 27. The remains of fossil elephants were found in the cave at Kirkdale, by Buckland; but probably of a different species from that which we have represented. It is on the confines of the icy sea that we most frequently meet with the remains of those stupendous animals. Indeed, from the mountains by which Asia is bounded, to the frozen shores of the ocean, all Siberia is filled with immense bones. Pallas tells us, that on the banks, or in the beds of every river in Asiatic Russia, from Tanais to the promontory of Tchutchis, there are to be found the bones of elephants. An entire elephant was found on the banks of the river Alaseia, which flows into the icy sea. It was in an upright posture, nearly entire, with its muscles in complete preservation, and covered by its skin, and to which some long hairs were still attached. So late as the year 1799, a Tongoose fisherman, noticed on the borders of the icy sea, near the outlet of the river Lena, in the midst of fragments of ice, a fossil elephant, but so much enveloped, that he could neither ascertain what it was, nor disengage it. Next year it was partially visible; and towards the end of the following summer the whole side, and one of the tusks were disengaged; and, on the fifth summer, the animal was thrown upon a sand bank, and he cut off its tusks, and sold them for fifty rubles. The flesh of the animal was still fresh, and was eaten by the dogs of the Yakoots and wild beasts. Such was its state of preservation, that the pupil of the eye was distinctly visible. The neck was provided with a long mane, and the skin was covered with black hairs, and a reddish wool. The bristles and hair weighed upwards of thirty pounds. The tusks were more than nine feet long, and the head, independent of them, weighed upwards of four hundred pounds. It was a male animal. The skeleton complete was collected by Mr Adams, and sold to the emperor Alexander for eight thousand rubles. We have represented the lower jaw of this animal at fig. 37.

GENUS DINOTHERIUM.

This, the most gigantic of all terrestrial mammalia, forms an intermediate link between the tapier and mastodon. The structures of the molar teeth of this genus are most nearly allied to those of the tapier, with two very large tusks situate at the anterior extremity of the lower jaw, and curved downwards like those of the upper jaw of the walrus, presenting a deviation from those of all other quadrupeds. The only use to which these tusks could have been applied, seems to have been to enable them to rake up from the bottom large aquatic plants; as it is probable that this was a strictly herbivorous animal, and that it was amphibious, and lived in fresh water lakes. It would be difficult to imagine how a terrestrial animal could sustain its head in walking, with two such enormous tusks; and it is still more difficult to conceive how the muscles of the lower jaw could support such a weight. But by supposing in an aquatic amphibious animal, we can easily see that this weight would be supported by the density of the medium. Buckland says these tusks "may also have been applied with mechanical advantage to hook on the head of the animal to the bank, with the nostrils sustained above the water, so as to breathe securely during sleep, whilst the body remained floating, at perfect ease, beneath the surface. The animal might thus repose moored to the margin of a lake or river, without the least exertion, the weight of the head and body tending to fix and keep the tusks fast anchored in the substance of the bank; as the weight of the body of a sleeping bird keeps the claws clasped firmly around its perch."

The gigantic Dinotherium (*D. giganteum*) was the largest quadruped which has been known to exist; measuring the great length of eighteen feet. The structure of its shoulder blade, or scapula, which, in form, is very like that of the mole, seems to indicate that the fore leg was adapted to co-operate with its enormous tusks, in digging large vegetables from the bottom of lakes. We have given a representation of the under jaw and tusks of this animal, pl. 65, fig. 34.

GENUS RHINOCEROS.

The number of bones of the rhinoceros, which have been discovered in Germany, Siberia, and other parts of Europe, is very considerable. An entire animal of the fossil species, which differs materially from any of those still existing, still retaining its skin, fat, and muscles, was dug up near the Wilhoui, on the east of Siberia, from under a hill, which is covered with ice the greater part of the year.

GENUS EQUUS.

The horse is one of those fossils which belong to the Pliocene periods of formation.

ORDER IX.—RUMINANTIA.

We find animals of this order in almost all the newer formations. Oxen and deer are not unfrequent.

GENUS CERVUS.

The most remarkable animal of this genus, which has been found in a fossil state, is the elk of the Isle of Man, which is also common to Ireland. A fine specimen of this gigantic animal is in the royal museum of the college of Edinburgh, almost perfect. It was dug up in the parish of Kirk Ralaff, Isle of Man, and secured for the university by the late duke of Atholl. It was found imbedded in loose shell-marl, associated with numerous roots and branches of trees. Over the marl was a bed of sand; above the sand a stratum of peat, principally composed of small branches and decayed leaves; and on the surface of all the common alluvial soil of the country. Its size is greatly superior to the existing elk of America and Asia. The following are its dimensions:—

	Ft.	In.
Height to the tip of the first dorsal vertebra, which is the highest point of the trunk, ...	6	1
Height to the anterior superior angle of the scapula, .	5	4
Length from the first dorsal vertebra, to the tip of the os coccygis, ...	5	2
Depth of the thorax, from the tip of the process of the eighth dorsal vertebra to the sternum, at the junction of the eighth rib, ...	2	2
Lateral or horizontal diameter of the thorax at the widest part, that is, at the eleventh rib, ...	2	0½
Height to the tip of the right horn, ...	9	[illegible]

CLASS II.—BIRDS.

The fossil remains of birds are very limited. In the strata of the secondary series, all that have yet been found are some scattered bones of a wader, discovered by Mr Mantell in the fresh water formation of Tilgate forest. Besides these, eight or nine others have been enumerated, belonging to the genera; falco, (buzzard) owl, quail, woodcock, sea-lark, (Tringa) curlew, and pelican. In the new red sandstone of the valley of Connecticut, professor Hitchcock has discovered the impressions of the footsteps of birds, which he refers to at least seven different species, all of which appear to have been waders with very long legs, and of various sizes, from that of a snipe to twice the dimensions of an ostrich. In the lacustrine formations of Cournou and Auvergne, some instances have occurred of eggs being preserved.

So imperfect are all the other fragments of birds, that a more minute detail of them would be quite unsatisfactory.

CLASS III.—REPTILES.

In the earlier periods of animal existence, reptiles seem to have been created of dimensions much greater than those which now exist. They were, besides, much more numerous in proportion, than at present.

Several reptiles of the lizard tribe, very much like the large monitors now existing in the torrid zone, are found in the bituminous slates of Thuringia, in the midst of innumerable fishes of genera now unknown. The Alpine limestone of Germany and Lorraine has produced skeletons of a large sea tortoise, whose shells might be from six to eight feet in length. The *Ichthyosaurus* (discovered by Sir E. Home), of the reptile family, has a head like the lizard, armed with conical and pointed teeth, enormous eyes, a spine composed of flattened vertebræ, slender ribs, and four limbs, of which the femora and humeri are short and thick. This extraordinary animal, of which four species have been discovered, and of which the largest is twenty feet long, is found imbedded in the oolitic and lias limestones. The *Plesiosaurus*, pl. 65, fig. 44, discovered by Mr Conybeare, and which belongs to the same formation, is still more gigantic in size. It has similar limbs, but more elongated and flexible. Its shoulder and pelvis are stronger, its vertebræ more assimilated to those of lizards, but distinguished from all oviparous and viviparous quadrupeds by a slender neck, as long as its body, rising from the trunk like the body of a serpent, and terminated by a very small head. Of this hydra-like monster five species are already known. They were discovered in England, and have since been found in France and Germany. Still another very remarkable genus of reptiles, found in the oolite and the higher sands, is called the *Megalosaurus*; for, with the shape of lizards, and particularly of the monitors, of which it has the cutting and indented teeth, it exceeded seventy feet in length. It was discovered in England by Mr Buckland, and has since been found in France and Germany. But the most remarkable animal found in the slaty limestones is the flying lizard,—a reptile with a very short tail, a long body, a muzzle greatly extended, and armed with sharp teeth, supported on high legs, the anterior extremity having one excessively long claw, which is imagined to have given support to a membrane for sustaining it in the air, together with four other toes of ordinary size, terminated by hooked claws. Three species of this extraordinary genus have been found, all of which are very small. The *Mosaurus*, found in the chalk mountain of St Peter, near Maestricht, is upwards of twenty-five feet in length. Its jaws are armed with very strong teeth, and its palate is furnished with teeth also. It has more than 130 vertebræ in its spine, one of which we have represented, pl. 65, fig. 19; and its tail is high and broad, and must have formed a large vertical oar. Scarcely less remarkable are the organic remains found by the celebrated Cuvier in the gypsum quarries about Paris. They belong to several families, some of which resemble the tapiers, others the rhinoceros, others the otter, though nearly as large as the wild boar. Besides the pachydermata, the same quarries afford carnivora, several sorts of birds, crocodiles, and tortoises.

ORDER II.—SAURIA.

The order of Saurian reptiles occupied the most extensive range of organised beings, in those remote ages, during the formation of the secondary series of strata, which may, with propriety, be denominated *the age of Reptiles*. Of these gigantic races, then the dominant class of animals, not a single species now inhabits our earth in a living state. They seem to have been the most formidable inhabitants both of land and water. The living saurians, in comparison of the fossil kinds, are but small animals.

GENUS ICHTHYOSAURUS, (OR FISH LIZARD),

Contains some of the most remarkable of these extinct reptiles. They have received this name from the circumstance of their vertebræ resembling those of fishes. These animals were endowed with extraordinary structure, and combinations of form, which are not now to be met with concentrated in one individual. For example, we find in one species the snout of a porpoise, the teeth of a crocodile, the head of a lizard, the vertebræ of a fish, the sternum or collar-bone of an Ornithorynchus, and the paddle-like fins of a whale, four in number. The tail was long and powerful. There must have existed seven or eight species, all pretty nearly alike. We have represented the common species, *Ichthyosaurus communis*, pl. 65, fig. 49. The generic characters are, head long, wedge-shaped; orbits *very large;* nostrils placed near the anterior angle of the eye; teeth conical, very numerous, sometimes to the extent of 180, ranged in a continuous furrow; jaws much elongated and projecting into beaks, and composed of numerous thin plates; vertebral column consisting of upwards of 100 joints; ribs slender, most of them bifurcated at top; four feet or paddles, shaped like those of whales.

GENUS PLESIOSAURUS.

Head short, somewhat oblong, obtuse; neck extremely long, consisting of about thirty-three vertebræ; body elongated; tail short; nostrils small, placed near the anterior angle of the eye; teeth numerous, and lodge in small alveoli; ribs composed of two parts, the one vertebral and the other ventral, the vertebral column consisting of about ninety joints. See *Plesiosaurus Dolechodeirus*, pl. 65, fig. 44.

Perhaps there has been no animal created of a more extraordinary form than this. In the length of neck it far exceeds even the longest necked birds. It is in this species five times the length of its head; the trunk of the body four times the length of the head; and the tail three times; while the head itself is only a thirtieth part of the whole body. From the whole physiology of the animal, Mr Conybeare says, that it was aquatic is evident from the form of its paddles; that it was marine, is almost equally so, from the remains with which it is universally associated; that it may have occasionally visited the shore, the resemblance of its extremities to those of the turtle, may lead us to conjecture; its motion, however, must have been very awkward on land; its long neck must have impeded its progress through the water, presenting a striking contrast to the organization which so admirably fits the Ichthyosaurus to cut through the waves. May it not, therefore, be concluded, (since, in addition to these circumstances, its respiration must have required frequent access of air,) that it swam upon, or near the surface; arching back its long neck like the swan, and occasionally darting it down at the fish which happened to float within its reach. It may, perhaps, have lurked in shoal water along the coast, concealed among the seaweed, and raising its nostrils to a level with the surface from a considerable depth, may have found a secure retreat from the assaults of dangerous enemies; while the length and flexibility of its neck may have compensated for the want of strength in its jaws, and its incapacity for swift motion through the water, by the suddenness and agility of the attack which they enabled it to make on every animal fitted for its prey.

GENUS MOSASAURUS.

The form of the head and teeth are nearly allied to those of the monitors. The teeth are fixed on the spheroid bone, and situated in the roof of the mouth, acting as barbs to prevent the escape of their prey; the vertebræ, 133 in number, are concave in front, and convex behind; the tail flattened on each side, but high and deep in a vertical position; there are four large paddles, like those of a whale.

The *Mosasaurus* has evidently been entirely an aquatic animal. It has been known by the name of the great animal of Maestricht, as it was found near that city, in the calcareous free-stone, which forms the most recent deposit of the cretaceous formations. Remains of this animal have lately been found by Mr Mantell, in the upper chalk, near Lewes, and by Dr Morton, in the green sand of Virginia. The length of this animal is about twenty-five feet; while none of the living species, to which it is somewhat allied, exceed five inches.

GENUS CROCODILUS.

There have been many species of this genus found in a fossil state, and these are easily recognized. They are imbedded in a great number of strata, both in the middle geological ages, and in the gypsum of Montmartre, near Paris; and also in the limestone at Caen, fig. 26, pl. 65, besides the blue calcareous marl, near Hornfleur, of which we have given a representation at fig. 25. It is unnecessary to enter particularly into the characters of those fossil species; we shall therefore content ourselves with a simple reference to our representation in plate 65. One of the most remarkable of the genus is the Crocodilus Priscus of Sœmmering, pl. 45, fig. 36. This animal was discovered in a limestone of a greyish white, which abounds in ammonites, and also furnishes enormous frize stones. It was in the celebrated quarry of Solenhoffen, in the valley of the Altmuhl, a little below Pappenheim, that this fossil was found.

SUB-GENUS GROSAURUS.

This is another sub-genus of large animals which seems to form an intermediate link between the monitors and the crocodiles. The remarkable animal, of which we have given a representation of its cranium, plate 65, fig. 21, and a single tooth, fig. 22; three vertebræ, fig. 23, and a rib, fig. 24, was found in a district called Meulenhardt, ten feet deep, enveloped in a bed of softish marl.

GENUS PTERODACTYLE.

The Pterodactyle, or flying reptiles, are perhaps the most singular animals which geological discovery has brought to light. So remarkable are the forms, and so incongruous the combinations of structure, that the first discovered animal of this genus was, by some naturalists, considered to be a bird, by another a species of bat, and by a third a flying reptile. This discrepancy of opinion arose from its possessing characters which agreed with these various animals. In the form of its head and length of its neck, it bears some analogy to birds: it has wings allied in structure to those of bats, with a body and tail approximating to those of the ordinary mammalia; and, like that of reptiles, the skull is small. It is provided with a beak, in which are placed sixty acute teeth. In this animal we have the structure of a Saurian reptile, of which it forms an extinct genus; with a conformation which adapts it for aerial excursions. In external form, these animals must have nearly resembled the present vampire bats, so common in South America, but with much longer snouts, not unlike those of crocodiles, and armed with conical teeth. Their eyes were of enormous size, from which we may infer that they were nocturnal animals. Their wings had projecting hooked fingers, like those of bats. These must have proved useful paws for the purpose of prehension, and also for enabling them to creep and climb. It seems probable that these animals possessed the power of swimming, as well as all other reptiles, both extinct and recent.

Eight species of this genus have been ascertained, varying in size from a snipe to that of a cormorant. The smallest known species is the *Pterodactyle brevirostris*, from Solenhofen; and professor Buckland found the *P. macronyx*, in the lias at Lyme Regis, which is about the size of a raven.

GENUS MEGALOSAURUS.

This genus was established by professor Buckland, and is a lizard of great size. It appears to have been an enormous reptile, measuring from forty to fifty feet in length, and in form somewhat between the crocodile and the monitor. It was discovered in the oolite slate of Stonefield, near Oxford; the principal place where these bones are yet found. Mr Mantell has, however, detected some remains of this animal in the Wealden fresh-water formations of Tilgate forest, from which it may be inferred that it lived during the deposition of the entire series of oolitic strata. A jaw, containing teeth and some other bones, was found in the oolite at Besançon.

GENUS IGUANADON.

The teeth of this animal almost entirely agree in construction with those of the existing Iguana; the construction of its feet prove it to have been a terrestrial animal, and, like the recent species, has had a horn of bone upon the nose. This immense animal far outstrips all land species, whether extinct or recent. Its length from the snout to the extremity of the tail is seventy feet; the length of the tail fifty-two and a half feet; and the circumference of the body fourteen and a half feet; whereas, the largest living species of Iguana does not exceed five feet in length. Mr Mantell has calculated that the thigh bone of the Iguanadon is twenty-five times larger than that of the living species, far exceeding in bulk that of the largest elephant; the circumference in its smallest part being twenty-two inches, its entire length must have been from four to five feet. From the construction of its teeth, which are much like those of the rhinoceros, it appears to have been a strictly herbivorous animal. This enormous creature was found by Mr Mantell in the fresh-water formation of Tilgate forest.

ORDER III.—CHELONIA.

GENUS TESTUDO.

The animals of this order are not met with in strata older than the carboniferous series. Cuvier mentions the shell of a sea-turtle, which was found in the Muschelkalk at Luneville, which measured eight feet in length. In the slate of the lower cretaceous formation at Glaris, another species was found; and a third in the upper cretaceous free-stone at Maestricht. Pl. 65, fig. 8, is a representation of a fossil tortoise, found in the quarries of Melsbroek, near Brussels. This was at first mistaken by Cuvier for a marine species; but more attentive examination convinced him that it was a land animal.

CLASS IV.—FISHES.

For the characters of the orders, see Ichthyology.

The history of fossil fishes is more imperfect than any other department, owing to so little being known respecting the living species; but the cloud which has so long hidden it is likely soon to be dispelled by the able and important investigations of professor Agassiz, who has already ascertained and described two hundred genera, containing upwards of eight hundred and fifty species of fossil fishes. These discoveries are of much importance to the geologist, and will enable him to follow this high class of vertebral animals, through the whole series of geological formations.

The most extensive deposits of fossil fishes in Europe, are the coal formations of Saarbruck, in Lorraine; the bituminous slate of Mansfield, in Thuringia; the calcareous lithographic slate of Solenhafen; the compact blue slate of Garis, the limestone of Monte Bolea, near Verona; the marlstone of Oeningen, in Switzerland; and of Aix, in Provence.

Of the existing genera of fishes, no species has been found in a fossil condition in any stratum older than the chalk formation. In the inferior chalk, there has been met with a species belonging to the living genus, Fistularia; in the true chalk, five; and in the tertiary strata of M. Bolea, species belonging to thirty-nine living genera have been ascertained; and thirty-eight which are extinct.

Agassiz has founded his classification of recent fishes upon the characters of their scales, which is peculiarly applicable to fossil fishes. So certain is the criterion, that from a single scale he will often be able to ascertain, with certainty, the genus, and also the species to which it belonged. This mode of discrimination is peculiarly useful in the study of fossil fishes, as in them the enamelled condition of the scales rendered them more durable than even their bones; and it not unfrequently happens, that all the scales of a fish are found in entire preservation, while their bony skeleton has entirely disappeared; this arises from the enamel of the scales being less soluble than the calcareous substance of the bone. M. Agassiz divides fishes into the following new Orders:

ORDER I.—PLACOIDIANS.

Skin irregularly covered with plates of enamel, frequently of considerable dimensions, and sometimes reduced to small points, like shagreen on the skins of many sharks, and the tooth-like tubercles on the skins of rays. This order embraces the whole cartilaginous fishes of Cuvier, with the exception of the sturgeon. See an example of the scales of this Order, pl. 65, figs. 89, 90.

ORDER II.—GANOIDIANS.

With angular scales, composed of horny or bony plates, covered with a thick plate of enamel. In this order he has included the sturgeon and bony pike. There are upwards of sixty genera, of which fifty are fossil. See example of scales, pl. 65, figs. 87, 88.

ORDER III.—CTENOIDIANS.

Scales jagged or pectinated like the teeth of a comb, or on their posterior margin. They are formed of laminæ of horn or bone, but are destitute of enamel. The scales of the perch are so constructed. See example of scales, pl. 65, figs. 91, 92.

ORDER IV.—CYCLODIANS.

Scales smooth, and simple at their margin, and often ornamented with various figures on the upper surface. These scales are composed of laminæ of horn or bone, but are destitute of enamel. The scales of the salmon and herring illustrate this order. See pl. 65, figs. 93, 94.

Each of these orders contains both cartilaginous and bony fishes; the representations of each prevailed in different proportions during different epochs; only the two first existed before the commencement of the cretaceous formations; the third and fourth orders, which contain three-fourths of the eight thousand known species of living fishes, appear, for the first time, in the cretaceous strata, when all the preceding fossil genera of the two first orders had become extinct.

The general result of the discovery and inquiry into these important fossil remains, is, that those which are imbedded in strata, of the greatest antiquity, differ more widely from existing genera and species than those of the most recent tertiary deposits, and afford a further confirmation, that all the great changes, in the character of fossil fishes, have taken place simultaneously with the most important alterations in the other classes of fossil animals, and in fossil vegetables, as well as in the mineral condition of the strata. M. Agassiz has found that fossil fishes, in the same formation, present greater variations of species, at distant localities, than we find in the species of shell and zoophytes, in corresponding parts of the same formation; and that this circumstance is readily explained by the greater locomotive powers of this higher class of animals. And an important result has attended his discoveries, namely, that the age and place of several formations, hitherto undetermined, have been rendered clear, by a knowledge of the fishes imbedded in them.

We can only allude to a few of this numerous Class, and point out a few which are imbedded in different formations.

Sauroid, or Lizard Fishes, of the family Ganoid.—These must have been very voracious animals, and in the character of their bones agreeing both with fishes and reptiles. Seventeen genera of this family have been ascertained by Agassiz, only two of which are to be found in a recent state; and these are the *Lepisoteus*, or bony pike of Lacepede; and *Polypterus*, the former inhabiting the Nile, and the latter the rivers of North America. The teeth of fishes of this family, of a conical form, and of a size larger than those of any crocodile, have been found in the coal formations in the neighbourhood of Edinburgh; these are considered to be of a new genus, which Agassiz calls Megalichthys. The magnesian limestone furnishes us with examples of the smaller sauroid fishes, and very large bones are found in the lias at Whitby and Lyme Regis; and the genera abound throughout the whole oolite formation, and almost disappear in the cretaceous formations. They have not been found in the tertiary formations.

Fishes of the genus *Amblypterus*, a genus limited to the early periods of geological formations, and is found in the carboniferous strata at Staarbruk, in Lorraine, and also in Brazil, pl. 65, fig 86. These animals seem to have been destined to feed on soft and decayed seaweed, and tender animal substances; as the teeth are numerous, very small, and set together in fasciculi, like the hairs of a brush.

Sharks seem more universally diffused in a fossil state than any other family. Insulated specimens of their teeth have been found in every country. Agassiz has separated this great family into three sub-families; the oldest of which he calls *Cestracionts*, which occupy every series of strata, from the transition to the beginning of the tertiary. There is only one living representative of this family in the *Cestracion Philippi* of Port Jackson. The second sub-family commences with the Muschelkalk, and probably with the coal formation, spreads over the oolite series, and ends at the beginning of the chalk. The *Squaloids*, or third sub-family, has its origin in the cretaceous formation, and extends through the tertiary strata. Fig. 16, pl. 65, is a tooth of an extinct species of shark, measuring four inches and a half in length, and three and a half in width at the base, which Lacepede considered belonged to an enormous animal, not less than seventy feet in length. Fig. 18 represents a tooth of a dog-fish, as given by Silla. The second division of this family is the Hybodonts, fossils of which appear with the coal formation, and prevail through the secondary strata under the chalk; the teeth of this sub-family present characters intermediate between cestracion and squaloids. Fig. 14 is another fossil tooth, resembling those of the *Squalus Zygena* in form. Fig. 17 is a longitudinally striated tooth, which was found in a moss with others, evidently belonging to the same fish, at the Old Passage, Gloucestershire, by Mr Johnson of Bristol, which last may be referred to a fish of this family.

The fishes of the Muschelkalk consist of species which are either peculiar to it, or are similar to those imbedded in the oolite and lias. During the middle geological ages, fish of the genus *Microdon*, and of the family Pycnodonts, or thick-toothed fishes, of which there are five genera. Another important and very abundant family, was the *Lepidoids*, which are remarkable for the great thickness and beautiful enamel of their scales. To this family belongs the genus *Dapedium*, of which we have given an example in the species *Politum*, from Lyme Regis, pl. 65, fig. 9. The scales of this genus, figs. 87 and 88, are generally provided on the upper margin with a large hooked process, not unlike that of a tile, which fits into a small pit, on the lower margin of the scales placed next above it. M. Agassiz has determined 200 fossil species with this sort of armour. No living example exists of all the genera found in the oolite series.

In the Chalk Formations, there is a remarkable change in the character of its fishes. This commences with the cretaceous series. All the genera which prevailed in the older series suddenly disappear, and are replaced by those of the new *Ctenoidean* and *Cycloidean* orders. Nearly two-thirds of the latter are now extinct; but these are more nearly allied to fishes of the tertiary series, than to those which had preceded the formation of the chalk. When we compare the fishes of the chalk with those of the elder tertiary series of Monte Bolea, we do not find a single species, and only a few belonging to the genera, that are common to both.

No sooner do our investigations reach the Tertiary Formations, than a still more decided change presents itself. These belonging to the Eocene period; more than a half of which are now of extinct genera, and not one of which can be found an existing species. The forms that now remain are only to be met with in tropical regions. Agassiz has re-arranged these fishes, and formed from them 77 genera, 38 of them extinct, and of which there are 127 extinct species. Of living genera there are 39, to which belong 81 fossil species, found at Monte Bolea. Belonging to the extinct genera, there are 46 species found at Monte Bolea. The fishes of the London clay, Sheppy, as well as Monte Bolea and Mont Martre, belong to the first period of the tertiary formations. Those fishes belonging to Oeningen, which all naturalists have considered connected with a very recent lacustrine deposit, have been referred by Agassiz to the second period of the tertiary series, and of a date corresponding with that of the Molasse of Switzerland. All of these belong to living genera, and only one species is of an extra European genus.

The rays which belong to the fourth family of the order of Placoidians, have not been found in strata older than the lias and the Jura limestone, and abound in the tertiary formation.

We have seen from the above rapid review of fossil fishes, that with the dawn of sub-marine existence, commenced, and has been continued to the present time, the same bony and cartilaginous forms, of this class. Their teeth, scales, and bones, all agree; and the extinct forms, which have been discovered, only fill up so many links which were awanting to complete this part of the elegant and beautifully constructed chain of being. Every period has had its animals performing, as at the present hour, those duties which are assigned to them in the place of creation.

CLASS V.—FOSSIL MOLLUSCA.

As we have before observed, the study of fossil shells forms the most important branch of geological inquiry; because they are often met with in so perfect a condition, and having all their parts so distinctly developed, they serve as, perhaps, the most certain criteria by which to judge of the different strata in which they are found imbedded. The perfection of these shells, in some degree, compensates for the total want of their animal inhabitants in a fossil condition; but many of these bear such a close analogy to those now living, that we may infer their inhabitants were nearly allied to existing species, and that their formation must have been similar. For a classification of these,and their generic characters, we refer to the article Conchology, and for the characters of the animals, to Mollusca, —a term which has, by recent naturalists, been rendered in English Mollusks.

The whole figures of the class Mollusca refer to plate LXV.

ORDER II.—CEPHALOPODA.

DIVISION III.—CEPHALOPODA POLYTHALAMA.

Family I.—Ammonacea.

Septa sinuous, lobed, and cut at the margins, meeting together upon the inner wall of the shell, and articulated by jagged sutures.

Bacculites.—Shell straight, cylindrical, sometimes a little compressed, slightly conical; the walls articulated by sinuous sutures; septa transverse, close, imperforate, lobed and lacineate at the margins.

Baculites Faujasii. Pl. 65. f. 1. Erect, cylindrical, opposite sides smooth and depressed; sutures with lobed dentations. Found in Mount St Peter, at Maestricht.

Hamites.—Fusiform; hooked or bent into two parallel limbs, chambered; septa undulated at their margins, with a siphuncle at their outer edge.

Hamites compressus. Pl. 65. f. 9. Depressed, curved at right angles; undulations very regular, sharp, slightly waved, bending towards the curve, and most prominent at the back.

Turrilites.—Spiral turreted, volutions contiguous, and all conspicuous; partitions articulated with sinuous sutures; septa transverse, lobed, and laciniated at the margin; siphuncle placed near the upper part of the volutions; aperture nearly round.

Turrilites tuberculata. Pl. 65. f. 2. Volutions beset in the middle with one row of large obtusely conical tubercles, and three rows of smaller ones at the base of each volution. Found in the marl stratum at Middlesham, parish of Ringmer, Sussex.

Ammonoceras.—Horn-shaped, arcuate, subsemicircular; the walls articulated with sinuous, laciniate, branched sutures; septa transverse, sinuous, imperforate; their margins lobed, laciniate; a marginal tube or syphon, not perforating the septa.

Ammonoceras glossoideus. Pl. 65. f. 3. Large, thick cylindrical, arcuated, lateral, depressed; inside flatly concave; apex compressed, tongue-shaped; nineteen inches two lines long. Found in the East Indies, and in Mount St Catharine, near Rouen.

Orbulites.—Subdisciform, spiral, with the volutions contiguous, the last enveloping the rest; the inner walls articulated by sinuous sutures; septa transverse, lobed at their circumference, and perforated by a marginal tube.

Orbulites striatus. Pl. 65. f. 4. Umbilicated; volutions hidden; transversely and minutely striated and ribbed; back acute. One and a half inch long.

Ammonites.—Discoid, spiral; volutions contiguous, and wholly visible; inner partitions articulated by sinuous sutures; septa transverse, lobed at the circumference, and imperforated at the disc; but perforated by a marginal siphuncle near the margin.

Ammonites Planatulus. Pl. 65. f. 5. Smooth, destitute of striæ or ribs.

Scaphites.—Concamerated, commencing with a depressed volution, with its last turn enlarged and elongated, and afterwards inflected.

Scaphites equalis. Pl. 65. f. 31. Involute, umbilicated, inner volutions concealed; surface with produced radii extending all round the volution; outer part rounded with about two projecting striæ between, and equal to each of the rays; outer volution ventricose, with greatly enlarged radii, and abruptly terminating without reaching the edge. The external surface has a nacred lustre. Found at Yeovil, in the green sand formation.

Ellipsolithes.—Univalve, elliptical, involute chambered, with all the volutions apparent; aperture lunulate on account of receiving in its inner part the return of the volution.

Ellipsolithes funitus. Pl. 65. f. 32. With numerous transverse, simple ridges, and intervening grooves somewhat wider than the breadth of the ridges; a kind of constriction appears at intervals, and distinguished by a small protuberance on the inner part of the rising immediately beyond it.

Family II.—Nautilacea.

Shell disciform, with a central spire, and short cells, which do not extend from the centre to the circumference.

SECTION I.—WITH CELLS.

Nautilus.—See article Conchology for the generic character.

Nautilus striatus. Pl. 65. f. 30. Slightly depressed; umbilicus large, exposing a small portion of the inner volutions; strongly striated concentrically; aperture orbicular, and nearly half the diameter of the shell; volutions gibbous, few, and increase rapidly. Found in the blue lias at Lyme Regis, Dorsetshire.

Nummulites.—Lentiform, attenuated towards the margins; spire internal, disciform, multilocular, covered over by several tables; the outer wall of the volutions complicated, extending and uniting on each side at the centre of the shell; cells very numerous, small, alternate, and formed by transverse imperforate septa.

Nummulites complanata. Pl. 65. f. 115. Smooth, round, very broad, and flat, with an undulating margin. This species is easily distinguished by its extreme thinness, and all the volutions and every septum being perceptible on the surface. Fig. 7. is a section of an unknown species. Found in the neighbourhood of Saissons, in France.

Vorticialis.—Discoid, spiral, multilocular with contiguous volutions, which are not visible externally; provided with imperforate transverse septa, which do not extend from the centre to the circumference; aperture marginal.

Vorticialis strigilata. Pl. 65. fig. 10. Somewhat depressed; spirally ribbed, and spirally striated.

Polystomella.—Discoid, multilocular, with invisible volutions, and numerous transverse ribs; aperture formed by variously disposed holes.

Polystomella crispa. Pl. 65. f. 11. Slightly wrinkled and ribbed transversely. Found in the chalk formations.

Siderolites.—Discoid, multilocular; volutions contiguous, but not visible externally; disc conoid on both sides, and studded with tubercular dots; the circumference margined with unequal radiating lobes; septa transverse, imperforate; aperture distinct, somewhat lateral.

Siderolites calcitrapoides. Pl. 65. f. 12. With four lobes, and punctuated throughout. Found in the mountain of St Peter, at Maestricht.

Discorbis.—Discoid, spiral, multilocular, with simple partitions; the volutions wholly visible, exposed and contiguous; with transverse, numerous, and imperforate septa.

Discorbis vesicularis. Pl. 65. f. 13. Volutions nodulous, subvesicular; the internal ones hidden by the nodules. Found at Grignon.

SECTION II.—WITHOUT CELLS.

Bellerophon.—Involute, and almost spherical, the last volution enveloping the others; aperture arched, and terminated by the extremities of the columella or axis, and provided with a sinus in its outer edge.

Bellerophon cornu-Arietis. Pl. 65. f. 28. Very thick, somewhat compressed; internal volutions few, suddenly enlarging and carinated near the aperture, which is considerably expanded; sinus large and angular. Found in limestone at Kendal, Westmoreland.

Family III.—Radiolacea.

Discoid with a central spire, and elongated radiating cells, extending from the centre to the circumference.

Placentula.—Orbicular, convex above and below, multilocular; aperture oblong, narrow, disposed like a radius in the lower disc, or sometimes in both upper and under.

Placentula astricans. Pl. 65. f. 14. Volutions convex, partitions radiating from the centre; back undulated, in consequence of a hollow at each partition.

Lenticulina.—Sublenticular, spiral, multilocular; outer margins of the volutions complicated, and extending above and below the centre; septa imperforate, curved, and lengthened on both sides in the form of rays; aperture narrow, projecting over the last volution.

Lenticulina rotulata. Pl. 65. f. 15. Orbicular; margins acute; disc globular. Found at Mendon.

Rotulites.—Orbicular, multilocular, spiral convex, or conical above; flat, radiated, and tubercular beneath; aperture marginal and trigonal.

Rotulites trochidiformis. Pl. 65. f. 16. Conoid; volutions carinated; lower one granulated. Found at Grignon.

Family IV.—Spherulacea.

Shell globular, spheroidal, or oval; with the volutions mutually enveloping, or the cells contiguous, and forming a tunic.

Melonia.—Subspherical, multilocular; spire central; volutions contiguous, convolute, tuniciform; cells numerous, narrow; septa imperforate.

Melonia Sphæroidea. Pl. 65. f. 17. Entirely globular, and divided by depressed ribs.

Gyrogona.—Spherical, concave within, composed of linear, curved canaliculate pieces; the external surface with carinated, parallel, partly transverse ribs, and bound at the last volution; aperture round, terminated by a small round shell.

Gyrogona costata.—Pl. 65. f. 6. Upper side with concentric, divergent ribs, and an umbilicated centre

Quinqueloculina.—With five cells surrounding the axis, and alternately embracing each other; aperture extremely small, orbicular, and situate at the base of the larger compartment.

Quinqueloculina striatula. Pl. 65. f. 110. With five compartments, the two longer ones somewhat embracing the others; all longitudinally striate. Found in the Calcaire Grossier, at Paris. It is not larger than the head of a small pin.

Triloculina.—With three cells surrounding the axis, alternately clasping each other; aperture semilunar, or sub-discoidal.

Triloculina communis. Pl. 65. f. 19. Three-lobed, the superior one striate at top; shell smooth and glossy. Found in the Calcaire Grossier at Paris. Very minute.

Biloculina.—Two-chambered, the inferior one losing itself; the superior aperture circular, with a bifurcate, projecting syphon in its centre.

Biloculina opposita. Pl. 65. f. 114. Shell with two opposed compartments; the superior one embracing the smaller. Found in the Calcaire Grossier at Paris. Very minute.

Family V.—Cristacea.

Shell discoidal, with an eccentric spire.

Orbiculina.—Subdiscoid, multilocular, with compound contiguous volutions; spire eccentric; cells short, very numerous; septa imperforate.

Orbiculina uncinata. Pl. 65. f. 19. Spirally striated, and the volutions separated by a deep sinus.

Cristellaria.—Semidiscoidal, multilocular; cells contiguous, simple, progressively enlarging; spire eccentric, sublateral; septa imperforate.

Cristellaria Squammula. F. 20. Shell externally covered with minute scale-like lines.

Renulina.—Kidney-shaped, flat, sulcated, and multilocular; volutions linear, contiguous, the second curved, the last lengthened; the axis marginal.

Renulina opercularia. F. 21. Semilunar, depressed, with arcuated concentric ridges. Found at Grignon.

Family VI.—Lituolacea.

Shell partly spiral; the last volution continued in a straight line.

Lituola.—Disciform, partly spiral and multilocular; volutions contiguous, the last terminating in a straight line; cells irregular; septa transverse and simple, the last perforated by three or six holes.

Lituola diformis. F. 22. Curved, semispiral, extremities obtuse; the base close. Found at Meudon.

Spirolina.—Multilocular, partly spiral, and discoid; volutions contiguous, the last one terminating in a straight line; septa straight, perforated by a tube.

Spirolina cylindrica. F. 23. Shell straight, apex partly incurved; aperture orbicular. Found at Grignon.

Family VII.—Orthocerata.

Shell straight, or nearly so, and not spiral.

Conilites.—Conical, straight, slightly inflected, having a thin outer crust distinct from the nucleus which it contains; nucleus somewhat separable, multilocular, and divided by transverse septa.

Conilites pyramidata. F. 24. Pyramidal, with the concave bands contracted. Found at Vanches Noires.

Hippurites.—Cylindrico-conical, straight, or a little arcuate, multilocular, with transverse septa; an internal lateral channel formed by two parallel, longitudinal, obtuse, and convergent ridges, the last cell closed by an operculum.

Hippurites infundibiliformis. F. 25. Funnel-shaped, four-chambered; lid with two wedge-shaped slits. Found at Grignon.

Orthocera.—Elongated, straight, or a little arcuated, and subconic; ribbed, with longitudinal, external grooves; chambers formed by transverse septa, perforated by a tube, which is either central or marginal.

Orthocera annulata. F. 29. Slightly tapering, and somewhat compressed, with strong, somewhat oblique, annulations, at a distance of about one-fourth the diameter from each other; siphuncle placed near the margin. Found in a limestone quarry at Colesbrookdale, Shropshire.

Belemnites.—Straight, conical, elongated, capable of being separated into two parts, the outer one being a solid sheath, produced above, and excavated with a conical cell beneath; the inner nucleus conical, and multilocular, divided by numerous transverse septa, perforated by a central tube.

Belemnites abbreviatus. F. 26. Tapering, sheath smooth externally, and striated internally.

Amplexus.—Almost cylindrical, divided into chambers by numerous transverse septa; septa embracing each other with their reflected margins.

Amplexus coralloides. F. 34. Tube irregularly curved, and striate longitudinally; margins of the septa regularly plaited, and deeply reflexed. Diameter an inch and a half. Found on the Black rock at Limerick, Ireland.

Conularia.—Conical, hollow, and divided by numerous imperforate septa.

Conularia quadrisulcata. F. 69. With four sides, somewhat lozenge in shape, straight, transversely sulcated, and longitudinally striate; sulcated at the four angles. Found in the transition limestone at Bristol.

Calcarina rarispina. F. 109. Doubly conical; top with a central bottom, from which radiate six lines dividing it into compartments, four of which are provided with central, marginal spines; aperture consisting of a slit in one of the lines. Extremely minute. Found in the Paris basin.

Clavulina corrugata. F. 112. Shell erect, tapering; provided with numerous compartments, transversely divided; the aperture circular, and placed in the superior one; inferior compartments complicated, separated into lozenge-shaped divisions. Found in the Paris basin.

ORDER III.—TRACHELIPODA.

SECTION I.—ZOOPHAGOUS TRACHELIPODA.

Family I.—Involutæ.

Conus dubius. F. 73. Shell smooth, spire about a third of the length of the shell, and with a slight indication of tubercles. Found in clay at Highgate hill, London.

Oliva Salisburniana. F. 72. Subfusiform, short, ventricose, smooth; mouth oblong, both lips tumid above. Found in Hampshire.

Ancillaria aveniformis. F. 66. Elongated, oblong-ovate, smooth and shining, spire long, acute; columella with two plaits; inner lip extension short; aperture somewhat more than half the length of the shell; inner lip extended over about a third of the exposed part of each volution. Found at Barton.

Terebellum fusiforme. F. 71. Cylindrical, subfusiform, spire visible and obtuse; aperture with an adpressed straight canal, proceeding from its upper angle to the apex of the spire. Found near Hordwell.

Seraphs.—Convoluted, elongated; spire internal, concealed; base truncated; aperture longitudinal, extending to the apex of the spire; lip acute; columella smooth. Distinguished from the terebellum, by the volutions of the spire being concealed.

Seraphs convolvulus. F. 37. Subcylindrical, slightly tapering towards the base, which is truncated; apex obtuse; external surface smooth; shell thin and fragil. Found in Hampshire.

Cypræa oviformis. F. 45. Oviform, tumid, smooth, and slightly marginated; aperture somewhat expanding towards its base, and obscurely toothed on its left side; right lip tumid and involute, and tapering to a short semibeak. Found at Highgate hill.

Marginella quadruplicata. F. 75. Very minute; oval, smooth, columella with four plaits, aperture linear, outer lip toothed and thickened. Found at St Hospice, Italy.

Voluta spinosa. F. 57. Turbinated, base transversely striate; body with longitudinal separated ribs; body wholly crowned with somewhat acute spines; spire short, acute, and spinous; columella from four to six plaited. Found at Grignon.

Voluta rarispina. F. 87. Obovate, base transversely sulcated; the body volution with remote, somewhat obtuse spines; spire short and mucronated; outer lip thick, internally striated; columella callous, with three depressed plaits.

Mitra plicatula. F. 93. Longitudinally ribbed; outer lip about half the length of the shell; columella with five plaits.

Mitra Dufresnei. F. 101. Spire short; body longitudinally substriate; with remote, transverse, strong striæ; pillar lip reflected on the columella, which is three plicated.

Columbella punctata. F. 76. Ovate with strong longitudinal and transverse striæ, which gives the shell the appearance of being deeply punctured; columella two plaited; outer lip slightly denticulated, and the aperture somewhat compressed. Found at St Hospice, Italy.

Eburna glabrata. F. 80.

Buccinum reticosum. F. 56. Oblong-ovate, acute, reticulated; with six volutions, the upper and lower parts rounded, and the sides somewhat flattened; outer lip denticulated within; the transverse striæ are in pairs; the aperture ovate, pointed above, and the lower end furnished with a recurved sinus. Found at Holywell.

Buccinum prismaticum. F. 104. With close, somewhat oblique longitudinal ribs, and transversely waved; striate; volutions considerably inflated, and deeply divided by the suture.

Buccinum semistriatum. F. 94. Spirally striate; shell consisting of six slightly divided volutions occupying half the shell.

Cassis bicatinatus. F. 61. Ovate, ventricose, with numerous transverse ribs, decussated by indistinct longitudinal costæ, towards the upper part of each volution, giving a chainlike appearance; aperture ovate; inner lip much reflected on the body, through which the ribs are visible; outer lip slightly tuberculated. Found in the crag at Bawdsey, Suffolk.

Cassidaria carinata. F. 85. Ovate, with transverse, thin, slightly undulating striæ; girdled with five subcarinated waved ribs, tuberculated on their upper edge; volutions of the spire flattened above; beak long, and slightly turned upwards. Found at Grignon.

Cassidaria echinoptera. F. 96. Ovate-globose, ventricose, with four broad, elevated, tuberculated, bands, occupying the upper portion of the shell; volutions of the spire angulated, with sharp tubercles on their upper edges.

Strombus lævis. F. 81. Shell smooth, shining; spire short, consisting of four volutions.

Rostellaria rimosa. F. 54. Fusiform, volutions slightly convex, longitudinally ribbed, and transversely striate; lip reflected, with a sinus at the inferior edge, below the expansion of the margin; with a canal at the superior edge, extending nearly the whole length of the spire; beak straight. Found in clay at Barton Cliff.

Murex striatus. F. 116. Ventricose; aperture wide; spire short, consisting of five volutions; the whole shell covered by numerous, sharp, wide set ribs, the intermediate hollows being striate, and intersected by longitudinal striæ; beak nearly straight. Found in the crag pits of Essex and Suffolk.

Murex centrarius. F. 47. Shell strong, reversed; spire with five volutions, separated by an undulating suture; aperture ovate-oblong; body and spire, with numerous distant, smooth, transverse ribs; beak short.

Ranella lævigata. F. 117. Ovate, ventricose, smooth, beak twisted short; lip crenulated within. Found at Piedmont.

Fusus longævus. F. 52. Body ventricose, surmounted by a row of large knobs; spire turreted, the volutions flattened at top, and slightly undulated at their edges; aperture ovate; beak as long as the spire, slightly bent near the base. This is a large shell, measuring sometimes 8½ inches. Found at Barton and Hordwell cliffs, Hampshire.

Fusus crispus. F. 102. With strong longitudinal ribs covering the body and spire; and transverse small thickly set ones; and with transverse intermediate striæ; spire with seven volutions; beak long, tapering, straight, and striated.

Fasciolaria turbinelloides. F. 99. Spire as long as the body, consisting of eight turreted volutions, separated by a strong suture, with large, slightly raised knobs, a row of which also surmounts the body; the whole shell covered with double, distinct striæ, somewhat undulating, and a few remote, waved longitudinal striæ.

Pleurotoma clavicularis. F. 84. Spire a third the length of the shell, consisting of nine smooth, slightly divided volutions, each with four strong spiral striæ at top, as well as on the body pillar; lip with a reflected columella, above which are numerous strong transverse striæ.

Pleurotoma denticula. F. 107. Spire very long, consisting of eight turreted volutions, each with a nodulous band at upper edge; body very small, and beak short; the whole shell covered with strong spiral striæ.

Pleurotoma tuberculosa. F. 86. Turreted, body very small, spire very large, consisting of ten volutions strongly tuberculated at top, and longitudinally wrinkled; the body surmounted by a band of four rows of tubercles, and a smooth band at its base; beak thick, very short, and longitudinally undulated.

Pleurotoma rotata. F. 92. Turreted, spire very large, of seven volutions, a greatly produced carination in the centre, with a row of large tubercles, which also surmounts the body, which is small; the whole shell covered with numerous spiral striæ, and three thread-like lines run spirally from the centre of the body to the apex; beak of moderate length.

Pleurotoma Vulpecula. F. 103. Turreted, spiral same length of body; longitudinally ribbed, and transversely striate; canal short, straight.

NERINÆA.—Turreted, elongated; canaliculated at the base; aperture narrow, oblique, and sub-quadrangular; columella large, perforated the whole length of the shell; thick and strong, with irregular projecting folds extend from the base to the apex over all the volutions; one and sometimes two plaits upon the right side, which correspond to the intervals of the plaits of the columella.

Nerinæa Mosæ. F. 118. Turreted, conical, irregularly subplaited; volutions subnodulous at their base, in the middle of the columella; columella three-plaited; right lip with two plaits.

Cerithium geminatum. F. 58. Conical, elongated, with twelve smooth volutions, each surrounded by seven or eight longitudinally disposed pairs of acute tubercles, and two obsolete transverse carinæ; lip even. Found at Barton Cliff.

POTOMIDES.—Shell univalve turreted; aperture almost semicircular, but destitute of a canal in the upper angle; base contracted into a short, slightly truncated beak; outer lip dilated, with a corneous operculum.

Potomides concavus. F. 38. Subulately conical, slightly striated transversely; volutions somewhat concave towards their upper sides, and provided with obscure, arched ribs, slightly raised above the middle, and extending nearly to the centre of the volutions; base convex, provided with one or two granulated carinæ; outer lip slightly grooved in its upper angle; columella smooth; aperture nearly circular. Found at Barton Cliff and Headon hill, Isle of Wight.

Turritella imbricatoria. F. 88. Turreted with sixteen, flat, transversely sulcated volutions, well defined by the suture; at the base of each volution there is a smooth, spiral belt; base of body smooth; aperture nearly circular, columella slightly reflected.

Turritella conoidea. F. 80. Base of each volution angular, and slightly projecting, with equidistant spiral striæ, seven or more with intermediate smaller ones, acutely crenulated.

Turritella proto. F. 90. With sixteen nearly flat volutions, each furnished with six smooth spiral ribs, the interstices smooth; base of body smooth, columella but slightly reflected above, thicker beneath, with a slight subumbilicus; aperture somewhat ovate.

Phananella angulosa. F. 65. Conical, smooth, with the volutions subcarinated towards their base; aperture nearly circular. Found at Shalcombe.

Turbo muricatus. F. 67. Short, conical, with numerous muricated ridges, which are equal to the concave spaces; outer lip plaited; columella indented at the base. Found in the coral rag at Steeple Ashton.

RISSOA.—Shell conical; spire shorter than the body; aperture subovate; inner lip reflected on the columella; outer lip thickened.

Rissoa lævis. F. 42 and 43. Smooth, subcylindrical, with six slightly divided volutions; apex obtuse; aperture semiovate.

PYRAMIS.—Subturreted and subconical; aperture entire, and usually distinct from the body.

Pyramis turgidus. F. 77. Turreted, with five much inflated volutions, separated by a deep suture, with strong longitudinal flat ribs, and very fine regular transverse striæ; apex acute. Found at St Hospice, near Nice, Italy.

Trochus Benettiæ. F. 55. Depressed, conical; obliquely wrinkled; base expanded, with a broad-waved margin; volutions externally irregular; base provided with a plicated partly covered umbilicus; aperture compressed.

Trochus magus. F. 97. Conoidal, thick, transversely and longitudinally striated; upper margin of the volutions crowned with tubercles; convex beneath, with strong circular striæ; base deeply umbilicated.

Solarium canaliculatum. F. 82. Convexly orbicular; above it is furnished with waved transversely granulated figures; umbilicus crenulated, and slightly canaliculated.

Solarium variegatum. F. 105. Orbicularly convex; transversely sulcated, and longitudinally striated; with a patulous, crenulated umbilicus.

EUOMPHILUS.—Shell involute compressed; spire depressed on the upper part; concave, or largely umbilicated beneath; aperture nearly angular.

Euomphilus pentangulatus. F. 33. With six volutions, a prominent central ridge on the upper side, and the under side obtusely angulated; striæ irregular and oblique; volutions almost wholly exposed; aperture pentangular. From the black limestone, near Dublin.

Scalaria similis. F. 119. Volutions contiguous; spire with eight volutions, each with distant, elevated, longitudinal oblique ribs, and strong spiral striæ; aperture nearly round. Found at Bramerton, near Norwich.

CIRRUS.—Spiral, conical, and destitute of a columella; funnel-shaped beneath; volutions united.

Cirrus acutus. F. 36 Conical, sharp, each volution furnished with an obscure carina near its upper part; aperture round. Found in Derbyshire.

Tornatella fasciata. F. 95. Covered with fine transverse or spiral striæ; apex acute; aperture compressed; columella with one plait.

ACTEON.—Shell elongated, and somewhat lengthened; aperture entire, oblong, generally about two-thirds the length of the shell; acutely angular above, and rounded underneath; outer lip sharp-edged; columella provided with a spiral, strong plait at its base; operculum oblong and corneous.

Acteon Noæ. F. 39. Shell very thin, oval, with transverse, equidistant, and somewhat wide striæ; and obsoletely decussated, the columella with one plait; outer lip slightly sulcated interiorly. Found in the crag at Walton, Essex.

Natica depressa. F. 46. Nearly globular, and subumbilicated at the base, with six volutions flattened above; columella depressed beneath; mouth angular at the upper parts. Found at Woodbridge, Suffolk.

Natica epiglottina. F. 100. Semi-globose; smooth; spire very short; mouth large, expanding; umbilicus compressed; semicylindrical, and half hid by the thickness on the pillar lip; above epiglottiform. Found at Montmartre.

PLEUROTOMARIA.—Shell turbinated, trochiform, and discoidal; aperture entire, oblique, rounded, or angular, with a larger or smaller cleft, but deep on the edge of the outer lip.

Pleurotomaria ornata. F. 120. Shell orbicular, discoidal; both sides somewhat convex, base perforated; with longitudinal, regular, slightly undulated striæ; umbilicus narrow, with a spiral rounded rib from the centre of the outer lip to the apex. Found at Caen and Bayeux.

Nerita tricarinata. F. 83. With three strong keel-like transverse ribs on the body, and deeply striate spirally; outer lip with strong undulations.

Ampullaria acuta. F. 70. Ventricose, longer than wide, smooth; spire small, acute; umbilicus small, half closed, sometimes entirely so; aperture ovate, elongated, twice as long as wide. Found at Christchurch.

Paludina concinnata. F. 44. Somewhat conical, with five slightly convex volutions; lower part a little angular; surface smooth. Found at Barton Cliff.

Melania striata. F. 43. Body and spire about equal, tapering, with from eight to ten volutions, spirally ribbed throughout: volutions well divided by the suture. A large shell, sometimes exceeding eight inches. Found in the coral-rag stratum, Wiltshire.

Lymnæa minima. F. 63. Elongated, with somewhat convex smooth volutions; aperture ovate, not half the length of the shell; body not ventricose. Found in limestone, Isle of Wight.

Planorbis cylindricus. F. 69. Cylindrical, with three or four adpressed volutions concentrically striated on the left side; aperture transverse, oblong, quadrangular.

Auricula turgida. F. 62. Ovate, acute, turgid, shining, and transversely striated; aperture oblong; lips thick; columella with two plaits; outer lip smooth, and thickened in the middle. Found in the blue clay at Highgate.

Helicina expansa. F. 68. Spire conical, somewhat depressed; volutions carinated; obscurely striated; ventricose beneath; callus expanded; aperture quadrangular.

Helix globosus. F. 64. Subconic, inflated, covered with obscure transverse striæ; outer lip reflected; body very large; spire a third the length of the body; umbilicus concealed by the coating on the inner lip. Found at Shalcombe, Isle of Wight.

Calyptræa orbiculata. F. 79. Orbicular, smooth, depressed, and slightly striate spirally.

Calyptræa trochiformis. F. 80. Trochiform, volutions somewhat rounded, and covered with long spines.

INFUNDIBULUM.—Obconical, hollow beneath, spirally convolate; with a central spiral columella, and a spirally decurrent plate or valve within; aperture round, expanded; lip sharp and entire

Infundibulum rectum. F. 35. Conical, striated concentrically; apex central, acute; volutions obsolete; valve rectangular; columella slender. Found at Holywell, near Ipswich.

Pileopsis unguis. F. 59. Depressed, suborbicular, obscurely radiated; vertex recurved obliquely, acute, and extended beyond the base; height about a third of its width. Found at Holywell crags.

PILEOLUS.—Shell conical, with a sub-central vertex, placed upright; base concave, centre tumid; margin thin; outer lip prominent, interior lip crenulated, with a very short internal spire.

Pileolus plicatus. F. 40. The depressed cushion provided with an elevated margin; centre subdivided by a sulcus; inner lip deeply crenulated; height nearly equal to the diameter of the base. Found in the oolite under the Bradford clay, at Ancliff. F. 41 represents the internal structure.

Emarginula crassa. F. 48. Oval, very thick, obtusely conical, furrowed, with four or five striæ between each furrow; fissure wide. Found in the crag, near Ipswich.

Patella lævis. Depressed, slender, conical, smooth, shining; aperture obovate; apex eccentric; height about a third of its length. Found in the alum clay at Whitby.

CLASS VI.—CONCHIFERA.

ORDER I.—MONOMYARIA.

FAMILY I.—BRACHIOPODA.

MAGUS.—Bivalve, inequivalve, equilateral, one valve with an angular sinus along an incurved beak; line of the hinge and back of the other valve straight, with two projections near the middle.

A partial longitudinal septum, with appendages attached to the hinge within.

Magus pumilus. F. 164. The beaked valve is smooth and hemispherical, with a circular edge, beak small and incurved; the other almost flat, with a lengthened transverse back. Found in the chalk, near Mundesley, Norfolk.

PENTAMERUS.—Inequivalve, with the sides equal, one valve divided into two parts by a longitudinal internal septum, the other into three parts by two septa; beaks incurved and imperforate.

Pentamerus Aylsfordii. F. 165. Nearly orbicular, longitudinally furrowed; tripartite valve convex, with a prominent incurved beak; bipartite valve gibbous, incurved, conical, with a greatly incurved beak. Found at Croft-Ambrey park.

Lingula mytilloides. F. 139. Beak indistinct, anterior, end slightly truncated, somewhat depressed towards the front; edge nearly straight, of a greyish blue colour, with a shining surface. Found in the dark-coloured limestone at Walsingham, county of Durham.

Spirifer cuspidatus. F. 163. Inversely pyramidal, longitudinally sulcated, back depressed, triangular, and equilateral; front elevated by a semicircular sinus, corresponding to a large longitudinal ridge, and depression in the under valve. Found below St Vincent's rock, near Bristol.

Terebratula concinna. F. 160. Almost globose, with very sharp longitudinal ribs covering the whole shell, seven on the elevated centre, and twelve or more on each side, regular; beak (f. 161) projecting. Found at Aynhoe.

Terebratula ornithocephala. F. 147. Ovate, gibbous, front straight, bounded by two obtuse lateral depressions, alike in both valves; perforation large, placed in the larger valve; breadth four-fifths of its length; sides somewhat compressed, producing an obtuse angular projection in front. Found in the blue lias at Pickeridge.

PRODUCTUS.—Equilateral, valves unequal, margin more or less cylindrical; hinge transverse linear; one valve convex, the other flat or concave.

Productus spinulosus. F. 166. Semicircular, a little depressed; hinge long and straight; convex valve gibbous towards the beak, covered with numerous small spines with indistinct ears; the other valve concave, and beset with numerous spines. Found in the limestone of Mid-Lothian, Scotland.

DIANCHORA.—Bivalve, inequivalve; one valve, with an aperture instead of a beak, by which the shell was attached to marine bodies; the other valve provided with a beak and ears; hinge without teeth.

Dianchora striata. F. 158. Somewhat spoon-shaped, oblique, beak prominent; free valve with a few obscure ribs at its base. Found at Chute Farm, near Warminster.

Ostrea Marshii. F. 172. Oblique, longer than wide, both valves deeply plaited, with seven or eight angular divergent rib-like undulations; edge thick, flattened. Found in the vicinity of Felmersham.

HINNITES *Dubuisoni.* F. 135. Bivalve, inequivalve sides nearly equal, radiated; eared; area of the hinge quadrangular, triplicate; cartilage sunk in a deep longitudinal pit; lateral portions in which the ligament is placed striated; sinus, for the reception of the byssus, small; muscular impression large, and connected with indentations remaining for the attachment of the mantle parallel to the margin of the valves.

EXOGYRA.—Inequivalve, unequal-sided, attached to other bodies; umbones spirally curved to one side; pit of the hinge curved, nearly linear; an obtuse tooth in the flat, free valve, which fits into a cavity parallel with the hinge pit, in the convex attached valve; each valve provided with one muscular impression.

Exogyra conica. F. 137 and 138. Smooth, deep valve more or less gibbous, curved, with an obtuse carination along the middle; flat valve suborbicular, with a greatly incurved, impressed beak. Found at Folkstone.

SPHÆRA.—Globular, with short, obtuse, incurved ears, with one central and two remote teeth about the hinge, the line of which is lengthened, slightly incurved, and terminating at one end with an indistinct tooth, beneath the insertion of the ear; in its centre is a large, irregularly formed tooth, transversely depressed, and pointing towards the incurved beak.

Sphæra corrugata. F. 154. Gibbous, ponderous; surface with coarse corrugations; rugæ placed transversely and obtuse, more conspicuous near the sides, nearly smooth in the middle, but extends over the ears. Found in the iron sand formation, east of Sandown bay, Isle of Wight.

Pecten quinquecostata. F. 129. Subtriangular, somewhat oblique, semicircular, and toothed in front; convex valve ribbed and inflated, with six principal costæ, and four intermediate and lesser ones; surface covered with fine transverse striæ; upper valve flat and toothed. Found in the Sussex chalk, near Lewes.

Plagiostoma gigantea. F. 137. Depressed, and smooth, deltoid, with the posterior side rounded into the front; ears small, anterior one longest, situated in a large, broad, and straight furrow; beaks pointed; surface with obscurely divergent striæ. Found in the fœtid limestone at Bath.

Lima gibbosa. F. 145. Elongated, gibbous; ears not conspicuous; centre of the valves with about eighteen divergent striæ, and smooth at the sides; twice as long as wide. Found in coarse limestone, in Cotswold hills, Glamorganshire.

INOCERAMUS.—Inequivalve, free, longitudinal, and somewhat inequilateral, hinge consisting of a callus, which supports the ligament, at one end crenulated, above which is placed the beaks.

Inocermus sulcatus. F. 152. Oblong, spatuliform, with about nine longitudinal and strong ribs, which have much the character of plaits of ostrea crista-galli; beaks prominent, one of which is considerably incurved and acute. Found at Lewes.

GERVILLIA.—Inequivalve, unequal-sided, oblique, greatly elongated; beaks placed near the anterior extremity; hinge long; divided into several pits, and provided with many, more or less lamelliform teeth; one muscular impression in each valve.

Gervillia aviculoides. F. 142 and 143. Obliquely lanceolate, curved, and pointed at both extremities; slope in which the hinge is situated nearly half the length of the shell; teeth of the hinge few, and similarly disposed. Found in the Shanklin sand.

Pinna lanceolata. F. 165. Greatly elongated, its length being four times its breadth; lanceolate, slightly curved, longitudinally striated, with a quadrangular section; each valve divided into two flat parts by a central line. Found in the ocheraceous limestone, near Scarborough.

PACHYMYA.—Transversely elongated, very thick, subbilobate, with the beaks near the posterior extremity. Ligament partly immersed, and attached to prominent processes or fulcra.

Pachymya gigas. F. 144. Shell thicker than long, slightly curved with parallel edges; posterior extremity small and round, anterior somewhat truncated, close at both ends. Found in the chalk at Lyme Regis.

Chama haliotoidea. F. 133. Somewhat depressed, oval, surface uneven, with an external longitudinal, curved, nearly marginal line, and a deep, sunk, curved furrow inside the deepest valve, extending from the beak around the deep side, from which it shelves to a flat surface, extending to the margin, where it is broad, and slightly crenate within; muscular impression large. Found in the green sand, parish of St Mary Donhead, Wiltshire.

Diceras arietina. F. 125. Somewhat heart-shaped, with divergent beaks.

Unio subconstrictus. F. 132. Ovate oblong, its length being twice its breadth; a constriction passing from the front of the shell towards the beak on the anterior side, which is subtruncated. Found in Derbyshire.

Trigonia striata. F. 162. Equivalve, inequilateral, trigonal; hinge with two divergent, elongated, compressed teeth, transversely grooved on each side, and fitting into furrowed cavities in the opposite valve.

MEGALODON.—Equivalve, longitudinal, acuminated towards the beaks; hinge provided with a long external ligament, a large bifid tooth placed upon a septum, across the beak of the right valve, and one irregular and one pointed tooth similarly situate in the left valve; a small pit near the teeth for the reception of the anterior ligament.

Megalodon aculeata. F. 140. Smooth, somewhat lanceolate, thick, with pointed incurved beaks; the surface uniformly convex. Found in the limestone at Bradley, Devonshire.

Pectunculus costatus. F. 130. Shell orbicular, depressed, with twenty-five longitudinal, sharp ridges, and a few transverse striæ; hinge provided with fourteen teeth; margin crenulated within. Found at Hordwell Cliff.

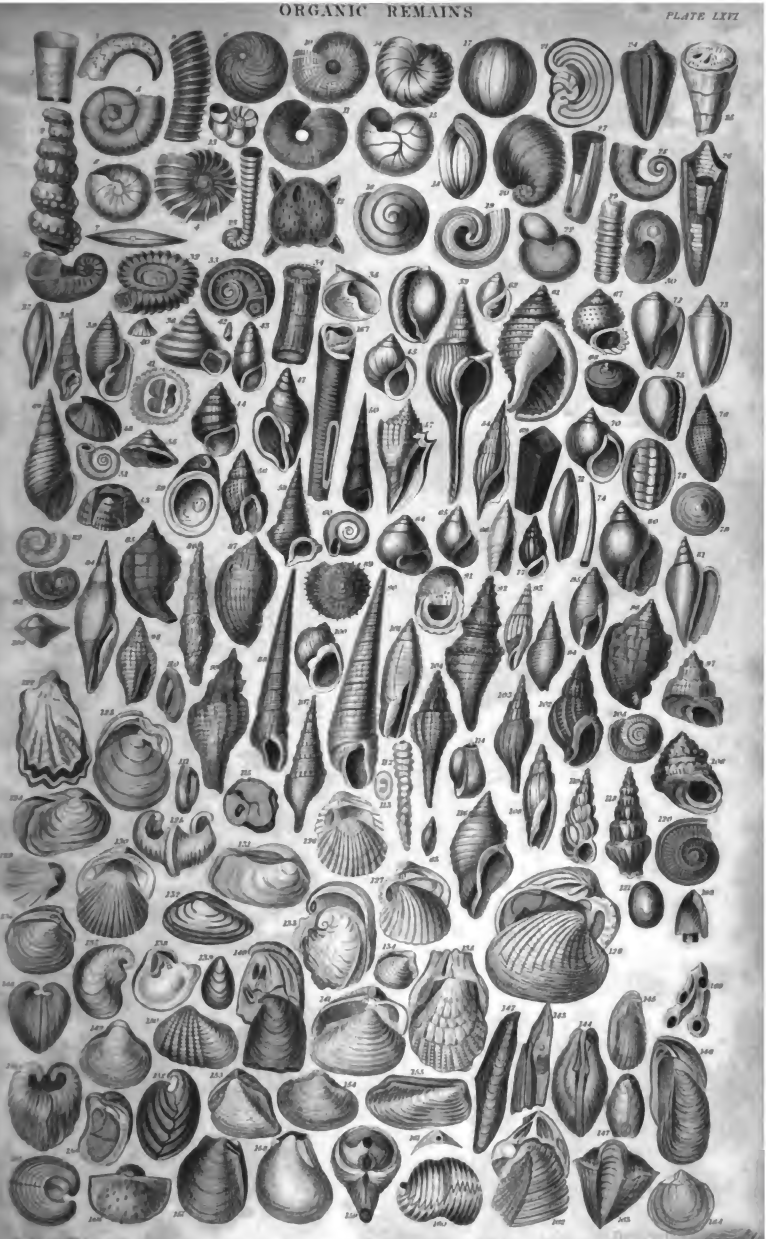
AXINUS.—Equivalve, transverse, and free; anterior side very short; posterior side considerably produced, truncated, and with a lunette near the beaks; hinge provided with a long oblique ligament, situated in a furrow.

Axinus angulatus. F. 153. Subhexangular, posterior side somewhat cuneiform, with a subcarination running from the sides to the beaks; posterior carination very obtuse. Found in the London clay, at Islington.

HIPPODIUM.—Equivalve, transverse; valves inflated; somewhat bilobed; hinge with a single rugged tooth; cartilage external.

Hippodium ponderosum. F. 151. Thick, gibbous, and rug-

ORGANIC REMAINS



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ed: transversely furrowed, and the lines of growth strongly marked; anterior lobe somewhat angular, and pointed; posterior lobe smaller, and rounded. Found at Toddenham, near Shipston-on-Stour.

Cardita planicostata. F. 127. With about twenty, longitudinal, divergent, flat, broad ribs, and the interstices very narrow; muscular impressions large and deep; margins strongly crenulated.

Cardita ajar. F. 126. Subcordate, with compressed longitudinal angular ribs, and the furrows subtuberculate; anal depression round.

Venus lineolata. F. 136. Somewhat gibbous, and cordiform; partly covered with zigzag striæ; anterior side smooth; edge entire; beak rather prominent; cicatrix slightly defined and cordate. Found at Blackdown, near Collumpton, Devonshire.

Cytheria exoleta. F. 123. Orbicular, finely striated concentrically; and with the lines of growth well defined; beaks prominent; lunule heart-shaped, and pointed.

MYACONCHA.—Equivalve, sides oblique, very unequal; hinge with an elongated oblique tooth in the left valve, and provided with an external ligament; beaks placed close to the posterior extremity, destitute of a sinus in the impression of the mantle.

Myaconcha crassa. F. 146. Ovate, mytiliform, thick-pointed at one end, and obtuse at the other, convex very slightly wrinkled; ligament placed in a wide and deep groove, length double its breadth. Found at Dundry, near Bristol, in the ironshot oolite.

Crassina lurida. F. 134. Transversely oblong, depressed, with numerous transverse, indistinct ribs; lunette elliptical, sharp; margin crenulated internally. Found in blue sandy clay, Foxhill quarries, Gloucestershire.

THETIS.—Equivalve, subequilateral, more or less orbicular, and very convex; ligament marginal; hinge with three or four acuminated teeth; the line of attachment of the mantle, with a deep sinus extending nearly to the beak; muscular impressions orbicular, small, and remote from the hinge; ligament internal.

Thetis minor. F. 148. Gibbous, wider than long; posterior edge rounded. Found in the green sand, Parham-Park, Sussex.

Petricola laminosa. F. 141. Ovate, gibbous, with erect concentric laminæ; posterior side subcuneiform; a single broad bifid tooth in the left valve, and two small teeth in the other. Found in the Suffolk crag.

Lutraria gibbosa. F. 131. Gibbous, anterior side much wider than the posterior, recurved, truncated, and gaping; length and depth equal; beaks much incurved and pointed. Found in the oolite limestone, Bath.

Mya mandibula. F. 124. Gibbous, depressed in the middle, transversely undulated; anterior side square, gaping, aperture oblong; posterior side somewhat straight; depth two-thirds its length; beaks incurved and pointed. Found in Micaceous sandstone at Devizes, Wiltshire.

PHOLADOMYA.—Transverse, thin, subhyaline, ventricose; the anterior portion short, rounded, the posterior more or less angulated and gaping; hinge composed of an elongated subtrigonal foveola, and a marginal plate in each valve; ligament, external, rather short; two indistinct muscular impressions; sinus in the impression of the mantle large; umbones approximated.

Pholadomya murchisoni. F. 150. Ovate, beaks very large; anterior side short, with six or seven elevated, obtuse, knotted, divergent ribs, occupying the middle area of the valves. Found at Brora, Sutherlandshire.

Teredo antenautæ. F. 167. Valves transversely striated; the anterior side with numerous, smooth, striæ; dorsal and posterior accessory valves shelly. Found in Essex.

CLASS VII.—CIRRIPEDA.

ORDER I.—PEDUNCULATA.

Pollicipes sulcatus. F. 168. Valves with longitudinal, elevated striæ, the central valve elongated, rhomboidal; posterior valve arched, broad lanceolate, and subcarinated, both marked with irregular, elevated, longitudinal striæ. Found in the upper chalk at Norwich.

ORDER II.—SESSILIA.

Balanus tesselatus. F. 53. Obliquely conical, thin, with six indistinctly ribbed valves, smooth; interstices transversely striated, producing a tesselated appearance, aperture oval. Found at Bramerton, Norfolk.

CLASS VIII.—ANNELIDES.

Serpula crassa. F. 169. Acutely conical, round within, triangular externally, about four times as large as the diameter of the end at the aperture. Found at Highgate.

Spirorbis concavus. F. 51. Discoidal, involute, concave on one side; the last volution but slightly attached. Found in the green sand at Dilton, near Westbury.

Dentalium nitens. F. 74. Slightly incurved, gently tapering to the smaller end; surface smooth and shining; aperture circular. Found in clay at Highgate.

The total number of species of fossil shells, which have hitherto been discovered in the tertiary series, is 3036. Of these, there are found in the Eocene period of strata, 1238 species; in the Miocene, 1021; in the older and newer Pliocene divisions, 777. In the newer Pliocene period, there are from 90 to 95 per cent. of *recent* species; in the older Pliocene period, from 35 to 50 per cent.; in the Miocene period, 18 per cent.; and in the Eocene, 3½ per cent.

The following species of shells are peculiar to the PLIOCENE TERTIARY PERIOD, and figured in pl. LXV. Turbo rugosus, f. 106; Trochus Magus, f. 97; Solarium Variegatum, f. 105; Tornatella fasciata, f. 95; Pleurotoma Vulpecula, f. 103; P. rotata, f. 92; Fusus crispus, f. 102; Buccinum prismaticum, f. 104; B. Semistriatum, f. 94; Mitra plicatula, f. 93; Cassidaria echinophora, f. 96; Cytherea exoleta, f. 123.

MIOCENE TERTIARY PERIOD.

Voluta rarispina, f. 87; Mitra Dufrenei, f. 101; Pleurotoma denticula, f. 107; P. tuberculosa, f. 86; Nerita Plutonis, f. 91; Turitella proto, f. 90; Fasciolaria turbinelloides, f. 99; Cardita ajar, f. 126.

EOCENE TERTIARY PERIOD.

Voluta costaria, f. 108; Pleurotoma clavicularis, f. 84; Cassidaria carinata, f. 85; Nerita tricarinata, f. 83; Calytræa trochiformis, f. 89; Turitella imbricataria, f. 88; Voluta digitalina, f. 98; Natica epiglottina, f. 100; Solarium canaliculatum, f. 82. Cardita planicostata, f. 127; Quinqueloculina Striatula, f. 110; Clavulina corrugata, f. 112.

To illustrate the variety which exists among these fossils, and, at the same time, to give an idea of the manner in which they disagree with recent shells, we shall give the results of the examination of British fossil shells. The number of genera at present known to British naturalists is about 140, which comprise nearly 3000 species. Of these

			Species.
58	genera	are simple univalves, which comprise	406
62	—	simple bivalves,	590
3	—	complicated bivalves,	51
12	—	multilocular bivalves,	240

To ascertain the relative proportion of the different classes contained in strata of different periods, we make three principal divisions in the formations containing organic remains: the first is the most ancient series; the second or middle division contains the remainder of the secondary strata; and the third consists of the tertiary deposits. The first, which is the lowest or most ancient division, may be subdivided into two series of formation:—

1. Carboniferous order of Mr Conybeare.

	Species.
Simple univalves,	27
Simple bivalves,	34
Complicated bivalves,	46
Multilocular univalves,	33
	140

2. From the carboniferous to the lias inclusive.

	Species.
Simple univalves,	9
Simple bivalves,	33
Complicated bivalves,	5
Multilocular univalves,	50
	97

The second or middle division, from the lias upwards, includes the entire oolitic series, and the strata up to the chalk inclusive:—

	Species.
Simple univalves,	106
Simple bivalves,	375
Complicated bivalves,	0
Multilocular univalves,	139
	620

The third, or most recent division, comprises all the beds above the chalk, or the tertiary formations:—

	Species.
Simple univalves,	259
Simple bivalves,	141
Complicated bivalves,	0
Multilocular univalves,	8
	408

The shells of the most ancient formations exceed, in complexity of structure, those in the subsequent strata, and in our present seas. They are more frequently endowed with that complicated structure which enabled their inhabitants to rise and sink with them in the water. Of this class are the numerous race of many-chambered univalves—the nautilites, the ammonites, and orthoceratites; and of the class of complicated bivalves are the spirifers, and the genera pentameras and productus. The table given above furnishes the means of comparing the numbers which existed in each class, during separate periods, or geological eras.

First Division.—Ancient strata, including lias.

	Species.	
Simple univalves,	36	
Simple bivalves,	67	
Complicated bivalves,	51	134
Multilocular univalves,	83	
	237	

Second and Third Divisions.—Remaining strata, above the lias up to diluvian.

	Species	
Simple univalves,	365	
Simple bivalves,	516	
Complicated bivalves.	0	147
Multilocular univalves,	147	
	1028	

It will thus be perceived, that the number of complex species in the first division is nearly equal to those in the immense series of succeeding strata, 134 being peculiar to the lowest, and 147 to the remainder. But the individuals are infinitely more numerous in the older strata than in the later, and give a more decided character to those formations than appears from a comparison of genera or species; and the class of complicated bivalves is wholly limited to this older division. The difference is still more striking when we compare the first with the third division; the simple univalves in the former being to those in the latter in the proportion of one to seven; but the complicated species in the same divisions are in the reverse ratio nearly of seventeen to one. On comparing the proportions which the classes of shells under each division bear to each other, differences equally remarkable are observable. Thus the univalves in the first division are to the complex species as one to four; in the second as one to one and one third only; and in the third, as thirty-two to one; so that, as a general rule, it may be stated, that the ancient formations are characterized by complicated shells, the middle series by bivalves, and the upper by simple bivalves.

CLASS IX.—CRUSTACEA.

This class of fossils has been but little attended to, and although rich in species, may be considered as a blank in the History of Organic Remains. In the Jurassic limestone fossil crustacea abound, and Count Munster has collected about sixty species from a single stratum.

In the present state, therefore, of this department, we shall not attempt a classification, but merely give two examples, which we have figured on pl. 65. f 50, is a crab from the Island of Shepey; f. 10 the claw of a crab from Maestricht.

The most widely diffused remains of all this class are the trilobites; they are found all over the north of Europe, North America, the Andes in South America, India, and in Africa at the Cape of Good Hope. But these have hitherto not been found in any strata which is more recent than the carboniferous series; and no other crustaceous animals, excepting of these forms, which are also *Entromonstraceous*, have been found associated with these trilobites: so that during the long periods that must have intervened between the deposits of the first strata containing fossils, and the termination of the coal formation. And it would appear that the trilobites were the only representatives of the *Crustacea*, which is now so much varied in families, orders, and genera. We have given an example of this family, by a representation of the genus *Serolis*, with an elongated caudal process, and also of the *Calymene Blumenbachii*, f. 95; another well marked trilobite, from the transition limestone of Dudley. F. 48 represents a fossil shrimp from Anspach.

CLASS X.—ARACHNIDES.

The only animal of this class which has been found in a fossil state, is a scorpion discovered in the ancient coal formation, at the village of Chomle, near Radnitz, on the south-east of Prague. It is remarkable that the horny covering of this scorpion is in a complete state of preservation, being neither decomposed nor carbonized. This substance, which is the same as the elytrine of beetles, seems to have the property of resisting decomposition and mineralization.

Mr W. Austin found an animal in the ironstone of Colebrook dale, which Mr Prestwich described in the Philosophical Magazine, and supposed it a spider. Professor Buckland has lately laid open that animal, and finds that it is not a spider, but a species of curculionidæ, a coleopterous insect.

CLASS XI.—INSECTS.

There have been extremely few insects found in a mineralized state. Coleopterous insects of two genera have been found in the ironstone of Colebrook dale. There is in the fine collection of Count Munster, twenty-five species of fossil insects found in the Jurassic limestone of Solenhofen. These are of different orders, viz. libellula, ranatera, and several species of coleopterous insects. Marcel says there have been ascertained insects of sixty-two genera in the tertiary gypsum, fresh water formation of Aix. These belong to the orders Coleoptera, Diptera, and Hemiptera. F. 39, pl. 65, represents an insect in stone from Papenheim; and figs. 40, 41, 42, and 43, are insects from the coal-slate, as figured by Llwhydd. F. 45 is a wing of an insect in calcarious spar, lately found at Fairybank, parish of Bothwell, Lanarkshire, by Mr John Craig of that parish. It was discovered near the bottom of a freestone rock, twenty feet in thickness.

CLASS XII.—ECHINODERMATA.

Professor Goldfuss, who has given minute attention to this department of natural history, is of opinion, that almost all the fossil echini, and asteria, belong to genera now existing. The echini appear to have existed through all the formations from the transition series to the present period; while the star-fish have not been found in older strata than the Muschel-kalk. We have given a few representations of these. F. 54, an echinus from Calne; f. 55, a cidersa from the same locality; f. 56, a nucleolites from the Calcaire Grossier, Normandy; f. 57, a *Clypeus sinuatus* from Oxfordshire; f. 58, a *Spantangus Cor* from Kent.

Of the star fish, we have represented three species;—f. 51, a fossil asteria, found at Horsington; f. 52, an *Oppiura Millers* from the marlstone of Yorkshire; f. 53, an asterias, which is nearly allied to the *A. pentagonaster* of Parkinson.

CLASS XIII.—POLYPI.

The organic remains of this class are exceedingly perfect in their structure, and extremely numerous. There are beds of limestone almost entirely made up of these fossils, more especially the encrinites. The most conspicuous of these are the entrochial marble of Derbyshire, and the carboniferous limestone near Bristol. These fossils also abound in the limestone, on the coast of Fife, near Kinghorn. We have illustrated the order CRINOIDEA, by representations of the encrinus liliformis, or lily encronite, which abounds in the Muschel-kalk of Germany; f. 67 and 68 is one of the vertebræ of this species. Mr Parkinson has shown, that the lily encronite is composed of the amazing number of 30,000 distinct bones, or articulations. F. 70 is a specimen of the tulip alcyonia, or *Siphonia*, from the green sand of Blackdown. F. 69 is a fossil sponge from Farringdon, which occurs plentifully in the ferruginous sand. F. 61, the *Madrepora truncata* from Gothland. F. 66, a fossil alconite; f. 64, a ramose milleporite, imbedded in compact limestone from Wiltshire; f. 63, a branch of Isis from Sicily; f. 62, a branch of ramose alcyonite from Berkshire, nearly allied to *A. digitatum;* f. 60, is a ramose tubiporite from Mendip hills.

FOSSIL VEGETABLES.

The same striking changes which have been described as having taken place in the animal kingdom, are equally manifest in the vegetable kingdom. It has been shown, that animal life first exhibited itself in the ocean; and in like manner we find, that the plants, occurring in the older strata, consist of those which have had a marine origin; and these seem to have been formed as food for the oldest oceanic inhabitants.

The fossil vegetables, which are distributed through the three geological epochs, indicating, in each respective group, the same successions of the diminution of temperature upon the land, as have been inferred from the remains of vegetables of the sea. Thus in the transition series we have the association of a few *existing* families, with *extinct* families, which indicate a climate hotter than the present time.

In the secondary formations, the fossil families are more numerously assimilated to the existing families; and many of the older families, and even genera, disappear.

In the tertiary strata, almost all the families of the first series are lost, and even many of the second disappear; and a more complicated vegetation takes place. In almost all the strata, beautiful, perfect, and very characteristic specimens are constantly met with; and we shall restrict this comprehensive subject to the mere representations of a few striking examples.

Pl. 65, f. 80, calcarious fossil wood found near Bath. F. 71, specimen of schistes, with an impression of the bark of a tree; and f. 73, 74, and 81, the impressions of leaves of plants. F. 72 is an impression of the stalk of a plant in sandstone; and f. 74 the impression of a leaf on the same substance. F. 78, a nut from the island of Shepey, the exact appearance of the kernel is preserved in the case. F. 77—79, and 80, represent a fossil nut found in Leicestershire; and f. 76 is the representation of another nut.

As respects vegetable remains in a fossil state, subterranean collections of bituminized wood, and other vegetable matter, are found at various depths in different parts of the world. Cannell coal as well as anthracite, frequently exhibits traces of ligneous texture in its substance, which could have been derived only from wood. The argillaceous iron-stone and slates that accompany coal contain, with remains of many other unknown vegetables, parts of various cryptogamous plants, the recent analogies of which are found only in tropical regions. It is impossible to give an idea, without figures, of the beauty and variety of the impressions thus found in the argillaceous and bituminous slate formations of the coal measures.—Concerning the mineral matters which enter into the composition of fossils that are denominated *petrifactions*—and all organic remains are thus termed whose original particles have given place to matter of another sort—they are chiefly of three kinds, viz., calcarious, silicious, and argillaceous. Iron and copper pyrites are found performing the same part, though with less frequency than the substance first mentioned. Fluor rarely occurs as the replacing material of fossils. The precise manner in which the substitution takes place it is difficult in many cases to conceive of: in general, we are sure that the mineral matter is slowly deposited by intromission into the original interstices and cavities of the organic body, or is introduced to fill the spaces which have been produced by the partial removal of the original organic substance.

In conclusion, we have only to remark concerning these monuments of former worlds, that, in the several formations composing the outer part of the earth down to the primitive rocks, the fossil remains which they contain vary in each formation, and at the same time differ from those beings which now exist. The discovery of animals peculiar to certain formations, and the general agreement with each other of the fossils of the same formations, have led to the belief that these several formations were the consequences of successive changes effected on the earth's surface; and that the contained fossils are the preserved remains of the several creations which had been successively formed to accord with the state of the planet under its several changes. In the lower, and consequently earlier formed, strata, are found the bituminized remains of unknown vegetables; and in the masses of mountain limestone are immense accumulations of crinoideal and terebratular remains, of the numerous species of which tribes scarcely a living individual can now be found. Here also exist the multilocular univalves in such abundance, while the genus *nautilus* is the only one of this family whose existence through a few species is continued to the present day. The fossils of the next superior formation—the lias—afford proofs, also, of their having been the production of a distinct creation. But the most decided proof of these fossils being the remains of another world, and of a distinct creation, is their containing relics of a tribe of enormous marine animals, such as quadrupeds possessing the blended structure of fish and lizard, no traces of which have been observed in the preceding strata. The fossil remains, through the succeeding higher formations of oolite, green sand, chalk, and clay, show new genera, both of saurian and testaceous animals; and when we follow, on the surface of the vast mass of upper clay, the traces of diluvial action, and the desolation which accompanied the last grand catastrophe which the planet appears to have sustained, we there find the remains of another creation—the terrestrial quadrupeds. These changes in the state of the planet, and this partial destruction, appear to have been succeeded by the creation of man, and of such quadrupeds and other animals as were fit inhabitants of the earth after its last change; from whence it appears that beings have proceeded, gradually increasing in superiority, from testaceous animals to reptiles, marine and fresh water amphibia, quadrupeds, and, lastly, to man.

For further information, see Parkinson's *Organic Remains of a Former World* (London, 1804—11. 3 vols., 4to); and his *Introduction to the Study of Organic Fossil Remains* (1822); Buckland's *Reliquiæ Diluvianæ* (London, 1824—28); and Cuvier's great work *Ossemens Fossiles* (3d ed., 1826, 5 vols.); Schlottheim's *Beiträge zur Flora Unterwelt*; and Sternberg's *Darstellung der Flora der Vorwelt*; Link's *Urwelt und das Alterthum* (Berlin, 1821); Schubert's *Urwelt und die Fixsterne* (Dresden, 1822); and Krüger's *Geschichte der Urwelt* (Quedlinburg, 1822). Godman's Natural History describes the fossil remains of North America. See, also, our articles *Geology*, *Mastodon*, *Mammoth*, *Megalotherium*, *Megalosaurus*, &c.

ORGANOLOGY; a term used to denote a branch of physiology which treats, in particular, of the different organs of animals, especially of the human species. It is, as may well be imagined, one of the most interesting branches of natural science.

ORGIES (ὄργια); the mystic rites and wild revels celebrated in honour of Bacchus; also the festivals and mysteries of other deities. (See *Bacchus*, and *Mysteries*.) The term has hence been applied to any scene of riotous mirth and excessive revelry.

ORIENTAL EMPIRE. See *Byzantine Empire*.

ORIENTAL LITERATURE. This vast field of learning, which comprises the languages and literature of nations, some of which are totally distinct from others, has been cultivated, in recent times, with great zeal. Not only is the number of Oriental languages, now studied, much greater than formerly, but they are much more accurately known. Formerly, even the most celebrated Orientalists, in general, possessed but a superficial knowledge; and the difference between the learning required from a classical philologist, and that expected from an Orientalist, in his branch, was very great. Many Orientalists were unable to conjugate or decline the Arabic correctly. The grammatical knowledge of some of these languages has become much more profound in our time, though there have been, yet, comparatively few Oriental works printed. This great change must be traced, in part, to the writings of Silvestre de Sacy, who may be considered as having more knowledge of Arabic than any other European scholar. His *Grammaire Arabe* (Paris, 1810) gave an entirely new turn to the study of this language, and indirectly influenced the study of Persian and Hebrew. This progress is, in part, also attributable to the zeal and activity of the British in India, which have been exerted not only on the Indian languages, but also in the publication of Persian and Arabian works. From British presses in the East Indies, at Serampore and Calcutta, and from the Turkish in Scutari and Constantinople, have issued the most important works of Oriental literature; for instance, the original dictionaries of the Arabs, Persians, and Turks. Not only has the study of the languages been much extended in recent times, but much has been done for its application to scientifical, historical, geographical, mythological, and philosophical investigations. It must be confessed, indeed, that instances are not wanting, in which inquirers have been seduced, by these discoveries, to erroneous theories, particularly through unfounded etymologies. Five Asiatic societies have been established, by Europeans, for the promotion of the study of Oriental literature, three of which are in India (in Calcutta, Bombay, and Madras), and are composed of scholars and military men. Each of them publishes its Transactions. That of Calcutta has published fifteen volumes, under the name of Asiatic Researches. That of Bombay, of a much later date, has published at least three volumes. The two other societies are that of Paris (founded in 1822, under the presidency of Silvestre de Sacy), and that of London (royal Asiatic society, founded in 1820, under the presidency of Colebrooke). The Paris society publishes the *Journal Asiatique*. The London society has published several volumes of extremely valuable Transactions. The Asiatic Journal is also published in London, which is useful for Asiatic intelligence, but in which, however, the literary articles are not generally of a very high character. The Annals of Oriental Literature, begun some years ago in London, ceased with the third volume. Similar periodicals appear in Calcutta and Malacca. Germany has, in this department, the *Fundgruben der Orients* (Mines of the East), published at Vienna, chiefly supported by the efforts of Von Hammer, and Schlegel's *Indische Bibliothek*, published at Bonn. There are institutions for instruction in the Oriental languages at Fort William in the East Indies, at Hayleybury in England (for officers in the East India company), at Paris, Vienna, and Petersburg. The libraries of Paris, London, Oxford, the Escurial, Rome, Gotha, Vienna, Berlin, Copenhagen, Upsal, Petersburg, and Constantinople, contain the richest materials in Oriental literature. Gotha contains more Oriental manuscripts than any other German city. They were collected by Seetzen, in Aleppo, Damascus, Jerusalem, and Cairo. Petersburg possesses the richest collection of Oriental (i. e. Mohammedan) coins, the inspector of which, Mr Frahn, is the most learned Oriental numismatist. The collection of manuscripts, in that city, has been increased by several taken during the last invasion of Turkey by the Russians, and the study of the Oriental languages will be greatly benefited by the newly established Oriental institution at Petersburg, intended for the instruction of Russian professors, interpreters, and diplomatic agents. The members will publish an Asiatic Journal. The languages to be taught are Arabian, Persian, Turkish, Tartar, Chinese, Mantchoo, Sanscrit, Tibetan, Mongolian, Calmuck, Georgian, and Armenian. After a study of five years, the students will be sent to the respective countries to perfect themselves.

Some of the most important works recently published in the department of Oriental literature, are as follows: In Sanscrit, the ancient learned language of India, great progress has been made by Wilson's Sanscrit and English Dictionary (Calcutta, 1819), before which there was no dictionary of that language. The best grammar is, as yet, that of Wilkins (London, 1808). A more recent one, by Yates (Calcutta, 1820), has given some valuable additions on prosody and grammatical terminology, but is, in other respects, not thorough. Frank, a German, published a *Grammatika Sanskrita* (Wurzburg, 1823); Bopp an *Ausführliches Lehrgebäude der Sanskritsprache* (Berlin, 1825, 4to); Frank also published a *Chrestomathie* (Munich, 1820—1821). Among the Indian writings published, are *Nala*, a romantic episode, from the Mahabharata, Sanscrit, and Latin, by Bopp (London, 1819); *Ardschuna's Visit to the Heaven of Indra*; also an episode of the Mahabharata, Sanscrit, and German, by Bopp (Berlin, 1824, 4to); *Bhagavadgita*, a philosophical episode of the Mahabharata, Sanscrit, and Latin, by Schlegel (Bonn, 1823). The whole poem *Ramâjana*, with a Latin translation, in eight vols , without the notes, has been published by A. W. von Schlegel. Among the works most recently published in India is the poem *Meghaduta* (Messenger of the Clouds), by Calidasa, with an English translation by Wilson (Calcutta, 1813); the two epic poems *Kiratardshunija* (Calcutta, 1814) and *Sisupalabadha* (Calcutta, 1815); *Dajakrama Sangraha*, a dissertation on the Indian law of inheritance (Calcutta, 1818). Haughton, professor at Hayleybury, has begun a new edition of the Code of Menu. Investigations in the department of comparative philology have been presented, by Bopp, in his *Conjugationsystem der Sanskritsprache* (Frankfort, 1816), and in the Annals of Oriental Literature. Schlegel has also promised an *Etymologicum Novum* relating to the same subject. Besides the Sanscrit, the living languages of India, more or less connected with it, have been cultivated with great zeal by the British: for most of them we now possess excellent manuals; for instance, for the Bengalese, the Grammar and Reader of Haughton (London, 1831); the Dictionary by Carey (Serampore, 1815): for the Hindoostanee, the Grammar by Shakespear (London, 1818); and the Dictionary by the same (London, 1820); for the Mahratta, the Grammar and Dictionary by Carey (Serampore, 1808 and 1810). Authors in these modern Indian languages have also been printed. (See *Indian Languages and Literature*) In the department of Chinese literature, Morrison's Grammar (Serampore, 1815); his Chinese and English Dictionary (Macao, 1815—1820); Abel Rémusat's *Elémens de la Grammaire Chinoise* (Paris, 1822), are works of high reputation. The Asiatic society at Paris has set on foot a revision of Rodriguez's Grammar of the Japanese. For the Tartar languages, we have Rémusat's *Recherches sur les Langues Tartares* (Paris, 1820). Klaproth published, at Paris, a Dictionary of the Mantchoo Tartar. Several Tartar works have been published at Kazan, chiefly destined for instruction in the Mohammedan religion; the Russian imperial chancellor, count Romanzoff, has ordered the printing of the Tartar historian Abulgasi. Works in Turkish, which is a Tartar language, are continually issued from the presses in Scutari and Constantinople. Jaubert has published a new Turkish Grammar, at Paris, but it is superficial. As regards the ancient Persian, that is, the Zend and Pelahvi languages, which Anquetil de Perron knew but imperfectly, we may expect more profound researches by means of the manuscripts which Rask has carried to Copenhagen. Among them are also writings in the Pali language, the ancient sacred idiom of Farther India. *Desatir* (Bombay, 1818) claims, likewise, to belong to the ancient Persian literature, but is probably of more modern origin. For the modern Persian, the original dictionaries, *Shems ellogat* (Calcutta, 1806) and *Burkani Kati* (Calcutta, 1808) are important. The most complete grammar is that by Lumsden (Calcutta, 1810, 2 vols., folio). Of the rich literature of this beautiful idiom, many works have been published in India. The most important among the latest, are the edition of the *Shanameh* of Ferdusi (Calcutta, 1811) and the *Iskendernameh* of Nisami (Calcutta, 1812). Sacy has published a religious poem, *Pend-nameh, ou le Livre des Conseils* (Paris, 1819). Kosegarten has published some extracts from the Persian tales of Nechschebi, in the *Tutinameh* (by Iken and Kosegarten, Stuttgard, 1822). Goerres has given an abstract of the great historical poem *Shanameh*, under the title *Heldenbuch von Iran* (Berlin, 1820). We have a view of the most important poets of Persia in Hammer's *Geschichte der Schonen Redekünste Persiens* (Vienna, 1818). (See *Persian Language und Literature*.) The study of Arabic—a noble, manly, rich, and cultivated idiom—has been much facilitated by the publication of the best original Arabic dictionary, *Kamus* (Calcutta, 1817). Sacy has published a new edition of his Grammar and *Chrestomathie* (Paris, 1826, 2 vols.) Kosegarten's *Chrestomathia Arabica* (Leipsic, 1824) contains unpublished historical and poetical selections, with a dictionary and grammatical explanations. Freitag, in Bonn, is occupied with a new

Arabic-Latin dictionary. A work of classic value for the study of Arabic, is Sacy's *Hariri* (Paris, 1821), accompanied with Arabic commentaries. Among the Arabic poems recently published, Kosegarten has given to the public the *Amrui ben Kelthum Moallaka* (Jena, 1819); Freitag, the *Carmen Caab ben sohair* (Bonn, 1822); Hengstenberg, the *Amriul Kaisi Moallaka* (Bonn, 1823); Horst, the *Carmen Motanabbii* (Bonn, 1823). The whole collection of Motanabbi has been translated, by Hammer, into German (Vienna, 1824). Among the historical works published are Rasmussen's *Additamenta ad Historiam Arabum* (Copenhagen, 1821); Freitag's *Selecta ex Historia Halebi* (Paris, 1819); Fraehn's *Ibn Foszlan* (Petersburg, 1823); Uylenbroek, *De Ibn Kaukalo* (Leyden, 1822); Hamaker's *Specimen Catalogi* (Leyden, 1820); Kosegarten, *De Mohammede ebn Batuta* (Jena, 1818); of the Arabian text of the Arabian Nights, two volumes have appeared in Calcutta (1818). Hammer and Hagen have given new German translations. The Arabian romance *Antar* has been translated into English (London, 1820). The most important numismatic works, of late, have been published by Fraehn, at Petersburg, Castiglioni at Milan, and Hallenberg at Upsal. (See *Arabian Language and Literature*.) For Hebrew, so nearly related to Arabic, Gesenius has done much by his dictionary; also for grammar, for instance, by his *Lehrgebäude der Hebräischen Sprache* (Leipsic, 1817). An excellent grammar has been written by professor Moses Stuart, of Andover (Mass.) Among the editions of Hebrew authors is to be mentioned Gesenius's *Isaiah* (Leipsic, 1821). In the rabbinical literature, the most recent works are, Winer's *Chrestomathia* (Leipsic, 1823), and Kosegarten's *Liber Coronæ Legis* (Jena, 1824), which contains fragments of an author of the sect of the Caraites. (See *Rabbinical Literature*.) Our knowledge of the Phœnician has been extended by Hamaker's *Monumenta Punica* (Leyden, 1822); and the history of the Phœnician, and of all other Semitic alphabets, has been illustrated by Kopp's *Bilder und Schriften der Vorzeit* (Manheim, 1819 to 1821). Gesenius's *Samaritanorum Theologia* (Halle, 1822), contains fragments of Samaritan hymns. A new Syrian Grammar has been published by Hoffmann (Halle, 1824). A new Syriac dictionary is a great desideratum; Quatremère, at Paris, has collected many materials for this purpose. We have an important work, remarkable also as a religious monument, in the Sabian, a dialect of the Syrian, in Norberg's *Codex Nasaræus* (Lund. 1815; with glossaries, 1816 and 1817). We have an apocryphal book of the Old Testament, in the Ethiopic, *Ascensio Jesaiæ Vatis*, Ethiopian and Latin, by Laurence (Oxford, 1819), and also the *Primus Esræ Liber*, Ethiopic and Latin, by the same (Oxford, 1820). Aucher has published a new Armenian Grammar and Dictionary (Venice, 1816 and 1817). The Armenian Translation of the Chronicle of Eusebius, and *Mémoires historiques et géographiques sur l'Arménie* have also appeared at Paris (1819). In the Armenian convent at Venice, Armenian works are constantly publishing. The Asiatic society, at Paris, is publishing a grammar and vocabulary of the Georgian. Important fragments of the Coptic literature have been published in Zoega's *Catalogus Codicum Copticorum* (Rome, 1810). Doctor Young and Champollion occupied themselves in deciphering ancient Egyptian writings. See the Account of the former, and the *Précis du Système Hiéroglyphique* of the latter; see, also, our article *Hieroglyphics*.

ORIFLAMME (*auriflamme*); the old royal standard of France, originally the church banner of the abbey of St Denis, which was presented by the abbot to the lord protector of the convent (formerly the counts of Vexin and Pontoise), whenever it was necessary to take up arms for the preservation of its rights and possessions. It was a piece of red taffeta (thence the name) fixed on a golden spear, in the form of a banner, and cut into three points, each of which was adorned with a tassel of green silk. When Philip I. afterwards united Vexin to the possessions of the crown, it fell to him to bear the banner as protector of the abbey. It was now carried with the armies, and eventually became the great standard of the kingdom. Since the time of Charles VII. it has never been carried into battle. See Lanzelot, *Mémoires de l'Académie des Inscriptions*, viii.

ORIGEN, one of the most learned ecclesiastical writers, surnamed, from his untiring diligence, *Adamantius*, was born at Alexandria, A. D. 185, and early instructed by his father in the Christian religion and the sciences. His teachers afterwards were Clement of Alexandria and Ammonius. In his early youth, he gave proofs of greatness of soul. When his father was thrown into prison on account of his religion, under the emperor Severus, Origen exhorted him to suffer martyrdom rather than renounce Christianity. After the death of his father, he maintained his mother and sister by giving instructions in grammar. At the age of eighteen, he was appointed to instruct the believers in Alexandria. Males and females crowded to his lectures. To escape calumny, he determined to mutilate himself; and he thought the act was justified by a passage in the New Testament. After the death of Septimius Severus in 211, Origen went to Rome, where he gained friends and admirers. After his return, agreeably to the desire of the bishop Demetrius, he continued his instructions at Alexandria. A popular tumult compelled him to flee to Palestine. He was so highly esteemed by the bishops there, that they permitted him to preach in their assemblies. His own bishop, moved with jealousy, recalled him. He was soon after invited to Achaia, which was distracted by various heresies. On his way to Cæsarea, in Palestine, he was consecrated to the office of presbyter by the bishops who were there assembled. This laid the foundation for the persecutions which imbittered the remainder of his life. Demetrius maintained that it belonged only to himself to consecrate Origen. He summoned two councils, deprived Origen of his priestly office, prohibited him from teaching in Alexandria, whither he had returned, compelled him to leave the city, and excommunicated him. This sentence was confirmed at Rome and by most of the other bishops. But the churches of Palestine, Arabia, Phœnicia, and Achaia maintained a connexion with Origen, who denied the errors of which he was accused, and went back again to Cæsarea. Theochristus, the bishop there, received him as his teacher, and intrusted to him the duty of explaining the Holy Scriptures. In the year 231, his persecutor died, and Origen now enjoyed in tranquillity his well deserved fame. Gregory Thaumaturgus and his brother Athenodorus employed him as their instructer. The persecution of the Christians, under Maximin, forced him to remain for two years in concealment. When peace was restored to the church, by Gordian, in 237, Origen took advantage of it to travel to Athens. He then went to Arabia, to which the bishops of this province had invited him, to refute bishop Beryllus, who affirmed that the divine nature of Christ did not exist before his human nature. Origen spoke with such eloquence that Beryllus recanted, and thanked him for his instructions. The same bishops called him to a council which they held against certain heretics who maintained that death was common to soul and body. Origen spoke on this subject likewise with such power, that he gained them all over to his own opinions. In a new persecution, under the emperor Decius, Origen was viewed as a pillar of the church, was thrown into prison, and subjected to the most cruel sufferings. Exhausted by this severity, he died at Tyre in the year 254.

Few authors have written so much as Origen: few men have been so much esteemed and admired, and yet attacked with such virulence, and persecuted with such severity, both during his life and after his death. He was reproached with having attempted to blend the Christian doctrines with the notions of Plato. Particularly in his book *De Principiis*, directed against heretics, and now extant only in the fragments of a translation by Rufinus, he presents a system founded on the Platonic philosophy; but he gives his opinions only as a possibility; moreover, the heretics of his own time, as he says himself, corrupted his writings. He has been accused, without reason, of favouring materialism. He expressly opposes those who consider God as having a corporeal nature. Of his works (represented to be 600), with the exception of the one just mentioned, there are extant only his Exhortation to Martyrdom, commentaries, homilies, and scholia on the Holy Scriptures, of which he may have intended to explain the whole. We still have a large number of them; but they are, in general, nothing more than free translations. He made a general application of the figurative or allegorical explanations of the Jews, and rejected the literal meaning, which he regarded as the mere external part of the former. Besides these exegetical works, he distinguished himself by his critical talent in his *Hexapla*, of which an edition was published by Montfaucon, and afterwards by Chr. Fr. Bahrdt. His work against Celsus is considered as the most complete and convincing defence of Christianity which antiquity can boast. His works, complete in four volumes folio, were published by De la Rue (Paris, 1733—59). There has been much contention about the orthodoxy of Origen. In the fourth century, the Arians appealed to his authority to confirm the truth of their doctrines. The most learned and the most celebrated fathers have been found both among his friends and opponents.

ORIGINAL. See *Deer*.

ORILLON, in fortification, is a small rounding of earth faced with a wall, raised on the shoulders of those bastions that have casements, to cover the cannon in the retired flank, and prevent their being dismounted by the enemy.

ORINOCO, or ORONOKO; a river of South America, one of the largest in the world. Its source has not been ascertained with certainty, but, according to La Cruz, it rises from the small lake Ipava, in lat. 5° 5′ N. It has a very circuitous course of upwards (including its windings) of 1500 miles, and flows into the Atlantic, opposite to the island of Trinidad, by about fifty mouths, seven of which are navigable. The principal mouth, six leagues wide, is south-east of Trinidad, in lon. 59° 50′ W., lat. 8° 30′ N. The Orinoco is connected with the Amazon by the Rio Negro and Cassiquiari, and receives the waters of many large rivers, among which are the Meta, Apure, Arauna, Caura, and Caroni. At the distance of 200 leagues from the ocean, it is from 2500 to 3000 fathoms wide; and at St Thomas, 3850 fathoms; and, in March, when the waters are lowest, it is 65 fathoms deep. During the rainy season, it inundates the immense plains through which it flows, the inundation extending, during the highest floods, from eighty to ninety miles on each side, presenting to the eye a boundless expanse of waters. On the banks of the Orinoco the magnificence of the scenery is beyond description. Forests of the greatest extant are filled with aromatic trees, which diffuse the most delightful odour; birds of the most various and beautiful plumage abound, and hordes of monkeys follow the astonished traveller. Passing these forests, enormous plains extend their verdant surfaces farther than the eye can reach, and the cataracts of the Orinoco give their name to the whole Cordillera, and are represented as the most tremendous that have ever been observed; but no good description of these falls has yet been given, though they constitute the only outlets from the country situated east of the Andes, to the vast plains of the Amazon.

ORIOLE (*icterus*, Briss.). The beautiful birds, designated under this name are well known, in all parts of the United States of America, by the richness of their plumage and the peculiar form of their nests. They are exclusively found in America, inhabiting the United States during the summer, and wintering farther south. The female differs widely from the male in brilliancy of colour and in size. The young resembles the female very closely. They usually moult but once a year, but the colours are more vivid in the spring, the plumage of the male, in winter, being somewhat like that of the female. They build in trees, fly well, and walk quick, holding the body almost erect.

The species inhabiting the United States are *I. Baltimore* (see *Baltimore Bird*); *I. spurius;* male bird chestnut; head, neck, wings, and tail black; female and young olive green; beneath yellow; wings and tail dusky. This species is commonly known under the name of *orchard bird*. It inhabits all parts of the Union in summer, and is far from being uncommon. *I. phœniceus*, or red-winged blackbird; this bird, so well known for his predatory habits, is found in all parts of the United States in large flocks. The male is black, with the lesser wing-coverts of a brilliant red; female blackish, varied with whitish. *I. xanthocephalus*, yellow-headed troopial, found in the Western territory and Mexico. It is black, with the head, neck, and breast yellow orange, and a white spot on the wing. The female is a dark brown; throat whitish, and a round yellow patch on the breast. *I. pecoris*, or cow-bird; a well-known species, inhabiting the Northern States during the summer, and wintering to the southward. These are the only birds that, like the cuckoo, deposit their eggs in the nests of other species: they also resemble the European starling, in following cattle and alighting on their backs. The male is glossy black, with the head and neck of a deep silky drab. The female is sooty brown, paler beneath. *I. agripennis;* reed bird or rice bird.

ORION; a hero of ancient mythology. He is commonly called the son of Neptune and of Beryllu. According to Homer, he was a beautiful youth, of whose charms Aurora became enamoured. The gods were jealous of her love, and Diana slew him with her arrows, in the island of Ortygia. According to other writers, he was a king and a great hunter, and, as Homer says, continued, even in the lower world, to hunt in a large meadow the animals he had killed upon earth. He was of such gigantic size, that when standing in the middle of the sea, the water only reached his shoulders. His eyes were put out by Œnopion, whose daughter he had attempted to carry away. The oracle, which he consulted, advised him to stand in the sea, exposed to the rays of the sun, until he should regain his sight. He died of the sting of a scorpion. Others say that Diana loved Orion so passionately that she wished him for her husband. This condescension so offended her brother Apollo, that he resolved on the death of the insolent mortal. When Orion, therefore, went into the sea, and his head alone was visible, Apollo asked Diana to try whether she could hit with her arrows that dark spot visible above the waters. The goddess shot the fatal arrow, which pierced the head of her lover. She was unconscious of her mistake, until the waves bore his body to the shore. The hero, after his death, was placed, with his hounds, as a constellation, in the heavens. It is the brightest in the northern hemisphere, and still bears his name. See *Constellations*.

ORISSA; a province of Hindoostan, belonging to the presidency of Bengal, lying in the eastern part of the peninsula, with the province of Bengal on the north, the Northern Circars on the south, the bay of Bengal on the east, and Gundwana on the west. The length is probably about 500 miles, and the breadth 100; but it has never been entirely explored. The western part is an almost impassable wilderness of thick woods and jungles, and rugged hills, infested by leopards and other beasts of prey. A great part of the province is extremely unhealthy. It has a population of about 1,200,000 Hindoos, of different tribes, and Mohammedans. The Moguls conquered it in the beginning of the seventeenth century, and parts of the province afterwards fell into the hands of the Nizam and the Mahrattas. The British acquired possession of it in 1803. See *Mahrattas* and *Hindoostan*.

ORKNEY ISLANDS, or ORCADES; a group of small islands on the northern coast of Scotland, (from which they are separated by the strait of the sea called the Pentland Firth, here about ten miles wide) forming the southern division of the shire of Orkney and Shetland. They are included between lat. 58° 44′ and 59° 25′ N., and lon. 19′ E. and 17′ W., being irregularly scattered over a space of about fifty miles in length by thirty in breadth. Their number, including the uninhabited islets or *holms*, is about sixty-seven; of these, twenty-nine are inhabited. The *skerries* are bare rocks, which are overflowed at high water. Among the principal islands are, Pomono, or Mainland of Orkney, by far the largest of the group; Hoy, North and South Ronaldshay, Sanda, Stronsay, Westray, Eday, Ronsay, Egilshay, Shapinshay, and Walls. The isle of Mainland forms a district containing the parishes of St Andrew's, Birsay, Dearness, Evie, Firth, Harray, Holm, and Paplay united, St Ola, Orphir with Cava island, Rendall, Sandwich, Stenness, and Stromness; with the royal burgh of Kirkwall (population 3065) and the burgh of barony Stromness. The other districts are those of the North Isles and the South Isles. The former includes the islands of Eday and Pharay, Egilshay, Enhallow, Gairsay, North Ronaldshay, Rousay, Shapinshay, Sanda, in which are the parishes of Burness, Cross and Lady; Stronsay, in which are the parishes of Lady-Kirk, St Peter's, including Papa-Stronsay island and St Nicholas; Westray, in which are the parishes of North or Lady-Kirk, East and West; Papa-Westray, and Wier. The district of South Isles includes the islands of Burray, Copinshay, Flotta, South Faira, Græmsay, and Hoy, which last two form the parish of Hoy; Walls Island, divided into the parishes of North Walls and South Walls; South Ronaldshay, including the parishes of St Peter's, or North Kirk, and Lady or South Kirk; Swannay, and Pentland Skerries. Besides these there are a number of islets or holms, which are uninhabited, but many of them afford good pasture for sheep.

The face of the country in the Orkneys is low, presenting, in general, a surface of heath, or coarse pastures, interspersed with spots of cultivated land, destitute of trees, or even of tall shrubs, except in a few gardens. There are some spacious and secure harbours on the coasts. Wild fowl are numerous; the heaths abound with red grouse, plovers, and snipe; eagles, wild ducks and geese, solan geese or gannets, swans, &c. are numerous. The skerries swarm with seals; sea otters, whales, cod, grampuses, oysters, &c., are found. Large seeds are often thrown ashore, which are called *Orkney beans;* they are carried thither from America by the gulf stream. The climate is variable. In summer it is light enough to read at midnight, and in midwinter the sun is only four hours above the horizon; but the northern lights are frequent and splendid. The language spoken in the Orkneys is English, intermixed with Danish or Islandic words and idioms, and with but little of the Scottish pronunciation or phraseology. The lower classes of the people were formerly much addicted to superstition, placing great confidence in dreams, charms, and omens; and believing in the existence of lucky and unlucky days, on the latter of which they carefully avoided going to sea, or commencing any new undertaking. But these vulgar errors have in a great measure been abandoned of late years; and the inhabitants in general do not yield in intelligence and sagacity to those of any other part of the British empire.

The early accounts of these islands are involved in many fables. They are first described by the geographer *Melas*, whose account is very inaccurate: Pliny the elder also mentions them, and states their number at about forty. They are afterwards described by Solinus, the supposed cotemporary of Agricola; who states, that in his time they had not a single inhabitant, and were overgrown with rushy grass: his accounts are by no means to be depended on; and, upon the whole, it seems generally to be allowed, that Julius Agricola, the Roman general in Britain, was the first Roman who landed on the *Orcades*, till then unknown, except by report, and subdued them. After that period, however, we know little about them. It is probable that the Picts possessed these islands until the subversion of the Pictish kingdom in Scotland by Kenneth II. They continued annexed to the Scottish monarchy until 1099, when they were assigned by king Donald Bane to the king of Norway, for the assistance which Donald had received from that king in his usurpation. They remained in possession of the Norwegians until the middle of the 13th century, when Magnus king of Norway transferred them to Alexander king of Scotland, who gave the property thereof to a nobleman sirnamed *Spiere*, an heiress of whose family brought it to the *Sinclairs* or *St Clairs*, one of whom was created prince of Orkney and duke of Oldenburgh, upon his marriage with a daughter of the king of Denmark. One of his successors having forfeited, the title and estate fell to the crown; but the islands were of small advantage to the Scots, being often disturbed in their possession by the Norwegians, who again asserted their right of sovereignty, and often possessed them, until the year 1470, when James III. of Scotland married Margaret, daughter of the king of Norway, with whom they again passed to the crown of Scotland in lieu of dowry; and, upon the birth of her son, they were finally ceded. Notwithstanding this, however, the Danes still continued to advance claims upon the islands till the marriage of James VI. with the princess Anne of Denmark, when the Danish government ultimately abandoned all their former pretensions. The superiority of the Orkneys was dismembered from the crown by the union parliament, and granted for a certain annual consideration to the earl of Morton, whom queen Anne also appointed hereditary steward and justiciary. When heritable jurisdictions were abolished in 1748, the appointment of the stewardship reverted to the crown; but the earl of Morton possessing the patronage of the stewartry, he long retained the posts of steward and sheriff. The superiority was afterwards purchased from the earl by Sir Lawrence Dundas for £60,000, and it still continues in the family of his descendant, lord Dundas. Population of the Orkneys in 1821, 27,179.

ORLANDO FURIOSO. See *Ariosto*.

ORLANDO INNAMORATO. See *Boiardo*.

ORLEANAIS; before the revolution, a fertile province of France. The Loire passes through and divides it. Orleans, which gave name to the province, was the capital. The forest of Orleans, in this province, contains 94,000 acres.

ORLEANS; a city of France, lying on the Loire; previous to the French revolution, capital of the government of Orleanais, at present, capital of the department of the Loiret, with a population (1827) of 40,340; lat. 47° 54′ N.; lon. 1° 55′ E.; seventy-five miles south-west of Paris. The houses are well built, but the streets in general are narrow and crooked. It has four handsome public squares, a Gothic cathedral, a Hotel-de-ville, the Chatelet, a splendid bridge over the Loire, of sixteen arches, and other edifices worthy of notice. The manufactures and trade of the place are still considerable, but have much declined. Philip of Valois erected it into a duchy and peerage in favour of his son, and Orleans has since continued to give the title of *duke* to a prince of the blood-royal. Charles VI. conferred it on his younger brother, who became the founder of the Valois-Orleans line. This line having become extinct, the title was borne by the third son of Henry IV., Gaston, who left no male heirs. Louis XIV. conferred it on his brother, the founder of the present line of Bourbon-Orleans. (*See the succeeding article.*) Philip the Fair instituted a university here in 1312, which formerly had great celebrity. In 1428, the city sustained a siege against the English, and was relieved by the Maid of Orleans (see *Joan of Arc*), whose statue, in bronze, stands in one of the public squares.

ORLEANS. Two houses of this name have occupied the throne of France.

1. On the death of Charles VIII. without issue, in 1498, Louis, duke of Orleans, great grandson of their common ancestor Charles V., and grandson of the first duke of Orleans, being the nearest heir, ascended the throne under the title of *Louis XII.* Henry III. (died 1589) was the last sovereign of this house, or the *Valois-Orleans* branch. See *France*, division *Statistics*.

2. The reigning house, or that of *Bourbon-Orleans*, is descended from Philip, duke of Orleans, son of Louis XIII., and younger brother of Louis XIV. His son Philip II., duke of Orleans, was regent of France during the minority of Louis XV. His grandson, Louis Joseph Philip, who distinguished himself during the French revolution of the eighteenth century, married Louisa, daughter of the duke of Penthiévre (son of the count of Toulouse, a natural son of Louis XIV.), and was beheaded in 1793. (See *these articles.*) His only surviving son is Louis Philip I., king of the French.

ORLEANS, Gaston Jean Baptiste de France, duke of; third son of Henry IV. and Mary of Medici, born 1608, was involved, without glory, and without success, in all the troubles that agitated the reign of Louis XIII. and the minority of Louis XIV., four times quitted the kingdom, and four times returned with arms in his hands. His early education was miserable, and was the cause of the feebleness of character which he displayed through life, although he had received from nature much more of his father's spirit than Louis XIV. The jealousy which the latter, particularly before his wife, Ann of Austria, had borne him children, entertained of his brother, was the first cause of that difference between them, which the duke's vindictive temper never allowed to be permanently healed. By his first marriage, with Mary of Bourbon, heiress of the house of Montpensier, he had a daughter, the author of some interesting Memoirs. (See *Montpensier*). To divert the duke from a second marriage, which the jealous king feared, and which even Richelieu esteemed hazardous, no efforts were spared to gratify his passion for play, and for the arts. He continued this life of dissipation until, in the dispute between the queen mother and cardinal Richelieu, he took part against the court. This dispute resulted in the triumph of the cardinal. (See *Richelieu*, and *Louis XIII.*) The duke of Orleans was also obliged to submit, and in his political conduct and life now displayed that singular vacillation which led the cardinal de Retz to say of him, that he engaged in every thing because he wanted firmness to refuse those who led him, and that he always came off with disgrace because he wanted courage to persevere. When the duke—who, at one moment, full of defiance, took arms against the court, and united himself with the enemies of his brother, and at another, full of humility, submitted to the king and the cardinal—sued for the hand of Mary, daughter of the duke of Lorraine, new disputes broke out between him and the king. The marriage was secretly concluded, and was not made known until two years afterwards to the king, who, by a decree of the parliament of Paris, had it declared null. This decision gave rise to a war of pens between the jurists and the theologians. The duke continued to take a part in all the troubles, and the validity of his marriage was not acknowledged until after the death of Louis XIII. During the disturbances of the Fronde, the vacillating enemy of Richelieu could not be a steady friend of Mazarin. He joined the condjutor De Retz, the soul of the Fronde, who soon saw through the character of his fickle and feeble confederate. After the termination of the troubles (1648), the duke was banished to Blois, where he died in 1660. See the *Mémoires* of his daughter, above-mentioned.

ORLEANS, Philip, duke of, only brother of Louis XIV., and founder of the house of Bourbon-Orleans, now on the throne of France, was born in 1640. Mazarin, who superintended the education of the two princes, had adopted the plan of the Eastern courts, to render one of them manly and the other effeminate. "Why," said he to Lamathe le Vayer, the tutor of Philip, "why do you wish to make the king's brother an able man? If he is more learned than the king, he will no longer know what blind obedience is." While Louis was early accustomed to play the king, his mother used to show the delicate Philip to the courtiers in petticoats. In his twenty-first year, he married Henrietta of England, sister of Charles II. The great esteem which the king showed for this princess excited the jealousy of of his brother. Soon after her return from England, whither the king had sent her to detach her brother from the triple alliance, she died suddenly, and her death was attributed to poison, to the administration of which the duke was suspected of being accessory. His jealousy seems not to have been unfounded, according to the accounts contained in the letters of his second wife, Elizabeth Charlotte, in which the charge of his being an accomplice in the poisoning is repelled. See the *Mémoires sur la Cour de Louis XIV. et la Régence*, extracted from her correspondence (Paris, 1822). The second marriage of the duke, with the princess Elizabeth (1671), was arranged by Louis, to secure the neutrality of the elector palatine, in the approaching war against Holland. In this war the duke distinguished himself, and the soldiers said of him that he was more afraid of the sun than of powder and ball. But the feebleness of his character displayed itself in all his tastes. Dress, masquerades, court pageants, were his great delights; and his wife, in the *Mémoires* above-mentioned, relates some amusing stories of his superstition. He died in 1701.

ORLEANS, Philip, duke of (not to be confounded with the regent duke of Orleans, afterwards Louis XII.), son of the preceding, was born in 1674. As regent of France during the minority of Louis XV. (1715—23), notwithstanding his talents and naturally good disposition, he paved the way for the revolution by his personal character, no less than by that of his administration, by the shameless profligacy of his court, and the public bankruptcy, which was the consequence of the financial schemes of Law. The duke of Orleans (known, till the death of his father, in 1701, as the duke of Chartres) united wit and eloquence with grace and amiable manners; his intelligence and good memory had enabled him to make considerable acquisitions without much effort. From Henry IV., whom he aimed to resemble, he inherited a confiding and happy temper, a simplicity and goodness of heart, a readiness to forget injuries, and the qualities of a warrior; but he wanted energy and strength of mind. Dubois, his tutor, became his guide. His precepts and example contributed to corrupt the young prince (see *Dubois*), and, by administering to his vanity and his pleasures, he soon acquired a great ascendency over his pupil. The prince was prevailed upon, through the influence of Dubois, and in opposition to the wishes of his mother) to comply with the desire of Louis XIV. in marrying Mlle. de Blois, the legitimated daughter of the king. By this marriage, which was not happy, he had three daughters and one son. The duke neglected his wife, who was proud and cold, and, when reproved by the king for his excesses, indulged in a course of secret debauchery. Among his dissolute companions (whom he called his *roués*), and in the society of prostitutes, he ridiculed all notions of morality and the superstitions of the aged king. (See *Louis XIV.*) In 1692, the prince served his first campaign, under marshal Luxembourg, in the Netherlands. In the war of the Spanish succession, he received a command in Italy; but his opinion was slighted, and Italy was lost. The king then placed him at the head of a corps under marshal Berwick, in Spain; but he thought himself not properly supported, and was also offended by the refusal to make his mistress lady of honour to the queen. When the fall of the feeble Philip V., in Spain, appeared probable, the duke formed the plan of raising himself to the Spanish throne; but his scheme was betrayed and his accomplices arrested. It was even made a subject of deliberation at Versailles, whether a process should be instituted against him. His enemies accused him of a design to excite the soldiers of Philip against their king, and the dauphin demanded his execution; madame de Maintenon also held him guilty; but the chancellor and the virtuous duke of Burgundy, son of the dauphin, defended him so strongly, that he was permitted to justify himself. The duke, from this time, devoted himself to the study of chemistry, with a certain Homberg, and in 1711 and 1712, the dauphin, the duke of Burgundy, his wife, and his eldest son, dying suddenly, one after another, the public voice openly accused the duke of having poisoned them. Only two members of the dauphin's family now survived—the duke of Berry, son-in-law of the duke of Orleans, and the duke of Anjou (afterwards Louis XV.), who, as two ladies of the court pretended, was saved only by an antidote. The duke was exposed to great danger from popular violence, and was shunned at court, although the king appeared to be convinced of his innocence. At this time, Louis signed an edict making his natural sons, the duke of Maine and the count of Toulouse, capable of the succession, and, in his will, named a council of regency, in which the duke of Orleans was to preside, but to have no other privilege except that of a casting vote. But the duke had already ceased to be unpopular; the military, the noblesse, and the parliament were favourable to him, and, twenty-four hours after the death of the king (September 2, 1715), measures were taken for declaring his will null; and the duke of Orleans thus became sole regent, as first prince of the blood. The new regent promised to administer the government on a plan found among the papers of the duke of Burgundy, and was conducted to his palace amidst the rejoicings of the people. The different councils were filled with his friends, and the abbé Dubois, who was commonly known by the name of the *abbé Friponneau*, was made a counsellor of state; on which occasion the regent said to him, "A little honesty, abbè, I beg of you." Dubois soon had an opportunity to render himself serviceable. Since the peace of Utrecht, France had stood alone. The measures of the regent raised the suspicions of the king of England. The Dutch had still less confidence in the French policy, and inclined more to the Austrian court, which was by no means on good terms with France; and with Spain the duke was involved in personal hostility. An alliance with Britain could alone render him secure; and Dubois not only effected this, but also the accession of the states-general, the consequence of which was the celebrated triple alliance concluded at the Hague (January 4, 1717), which baffled the plans of Alberoni, and entirely divided the Spanish and French houses of Bourbon in their political course. Notwithstanding this, that subtle politician, who had been made minister of foreign affairs, afterwards concluded a double alliance between the French and Spanish courts, by the marriage of Louis XV. with an Infanta, and of the prince of the Asturias with the princess of Chartres. The fatal consequences of Law's scheme were owing to the manner in which it was executed, and to the inconsiderateness of the regent, who expected to obtain, by means of it, a mine of gold for his mistresses and favourites. He endeavoured, without success, to raise the bank notes and public paper to their nominal value, by a depreciation of the value of the metals, and finally issued the tyrannical edict (February 24, 1720) that no person should have in his possession more than 500 livres in silver, coined or uncoined, under the penalty of 10,000 livres. All credit immediately disappeared, and the first seeds of the revolution were sown. The regent, who hated all exertion, left the ministers to conduct affairs at their own pleasure, and the politics of his court became very vacillating. He obliged the legitimated sons of Louis XIV. to renounce their claims to the succession, and the privilege of styling themselves princes of the blood. To revenge this act of violence, the duchess of Maine entered into a conspiracy with the Spanish minister Cellamare to displace the regent. The duke pardoned her, but some of her accomplices perished on the scaffold. De Mesmes, president of the parliament, protested to the regent his innocence of any participation in the plot; but the latter proved his guilt, and pardoned him. In other respects, justice was strictly and impartially administered. A count Horn was condemned to be broken alive for the murder of a banker. The family and the courtiers represented to the regent, that the count was connected with the most illustrious families, and even with himself. "Gentlemen," replied the prince, "the shame is in the crime, not in the punishment; and as for myself, I will bear my part of the disgrace." In 1723, he finally resigned the government into the hands of the young king, whom he had gradually made acquainted with affairs in an unrestrained manner, and gave himself up to the wildest excesses. Yet, after the death of Dubois (August, 1723), he took upon himself the duties of premier, and would allow his favourite *roués* no share in affairs; and it is remarkable, that, even in his orgies, no state secret ever escaped him. He died in December, 1723, of apoplexy, the consequence of his excesses, at the age of forty-nine.—For an account of the regent and the regency, see Marmontel's *Régence du Duc d'Orléans* (Paris, 1805); St Simon's *Mémoires;* and particularly Sevelinges's *Mémoires secrets et Correspondance inédite du Cardinal Dubois* (Paris, 1815).

ORLEANS, Louis Joseph Philip, duke of, great grandson of the preceding, was born in 1747, and until the death of his father, in 1787, bore the title of *duke of Chartres*. During the revolution he acquired an unfortunate notoriety, and, even in his youth, was distinguished for his unbridled licentiousness. His wife, Louisa Mary Adelaide de Penthièvre (born 1753), whom he married in 1769, inherited the virtues and piety of her father, the duke of Penthièvre. The duke of Chartres was accused of having seduced her brother, the prince of Lamballe, to participate in his excesses, for the purpose of ruining his constitution and inheriting his estate. This marriage was only a source of unhappiness to the duchess, who turned all her thoughts to the education of her sons, of whom the only survivor, Louis Philip, now occupies the throne of France. Nature had done much for the duke of Orleans, fortune yet more; he was immensely rich: his person was rather above the common stature, and his countenance was pleasing, until his debaucheries had disfigured it with eruptions. He was dexterous and active in bodily exercises, not without intelligence, but ignorant and credulous; a good-natured, weak man, without any decision of character. After having indulged to satiety in all sensual pleasures, he found a new kind of excitement for his palled appetites in the storms of the revolution, and a new source of pleasure in the gratifications of revenge. His public life was entirely the work of circumstances. Entitled by his birth to the place of grand-admiral, he commanded a division of the fleet against Keppel, in the action off Ushant, in 1778; but his division was not brought forward: the duke was accused of cowardice, and, instead of being created grand-admiral, he was made colonel-general of hussars. From this time may be dated his hatred of Louis XVI. Several years later, he was chosen grand-master of the free-masons in France; and, in 1788, on the beginning of the disputes between the court and the parliament, he embraced the popular cause, and opposed the king in the *séance-royale* of November 19, on which account he was banished, but treated with marks of honour by the people. He then purchased large quantities of corn, for the purpose of supplying the poor gratuitously or at low prices, and, in 1788 and 1789, caused warm rooms to be prepared, into which the destitute were received and fed.

Having been nominated to the states-general as deputy of the noblesse of Crespi, in Valois, he espoused the cause of the third estate. Want of courage, only, prevented him from appearing at the head of the populace. On the 12th of July, 1789, he appeared among the crowd in the garden of the *palais royal;* but his courage failed him, and he soon withdrew into his palace. His adherents now used him merely for their own purposes, and flattered his ambitious hopes so long as he was necessary to them. He caused scandalous libels against the queen, whom he pursued with the most bitter hatred, to be distributed; and his bust was carried in triumph through the streets by the populace. The attempts of the 5th and 6th October, of which he is considered the instigator, were but partially successful. Lafayette threatened him with a legal investigation, and the terrified prince obtained permission of the king to retire to England. He returned in eight months, took the civic oath, and was acquitted by the assembly of the charges brought against him. On the flight of the king, he declared that he should decline the regency in case it were offered to him. An attempt was made at this time to reconcile him to the court, and the negotiations had taken a favourable turn; but the courtiers, who knew nothing of the matter, treated him with the most insulting contempt, on his appearance at court, in January, 1792, and even spit upon him as he went down stairs; and he was thenceforward the irreconcilable enemy of the king and queen.

The 20th of June and the 10th of August (1792) must have convinced the duke that a stronger party than his own had now acquired the ascendancy. He was returned to the national convention as member for Paris, with Marat, Robespierre, and Danton, and, in September, 1792, he assumed the name of *Egalité*, and, in December, declared, through the press, his renunciation of his right of succession to the throne. On the trial of the king, he voted for his death, and was present at the execution. The Jacobins, who had no longer any occasion for him, now abandoned him: he was struck from their rolls, and included in the general proscription of the Bourbons. He was imprisoned at Marseilles, but was afterwards transferred to Paris, and condemned to death by the revolutionary tribunal for a conspiracy against the republic. He heard his sentence with calmness, and died with firmness on the same day (November 6, 1793). His wife, who returned to Paris after the restoration, died there in 1821.

ORLEANS, Maid of. See *Joan of Arc*.

ORLEANS, New. See *New Orleans*.

ORLEANS TERRITORY. See *Louisiana*.

ORLOFF; a Russian noble family.—*Gregory Orloff* was one of five brothers, who lived a dissipated life. After his fortune was ruined, he supported himself by gambling and other arts. He served in the seven years' war, and, when count Schwerin was taken prisoner, carried him to Petersburg. The grand-princess Catharine, who had just lost her favourite Poniatowski, fell in love with him. He and his brothers assisted her much in the revolution, by which she was declared empress, and her husband, the emperor Peter III., deprived of life. Orloff soon attained the highest dignities; was allowed to wear the picture of the empress in his button-hole; and became enormously rich. But Orloff was rude and inconsiderate, so that, after some time, the empress wished to rid herself of him. He was sent to Moscow to take measures against the plague, and, when he returned, was represented on a medal and triumphal arch in the character of Curtius. He was then sent to Fockschani, in Walachia, to attend a conference with the Turks, whom, however, he offended by his overbearing character; and the object of the meeting was lost. The empress now sent him into a sort of banishment, ordering him to remain at one of her castles, to be chosen by himself. He went to Zarskoe-Selo. In 1772, however, she became reconciled to him. She gave him a magnificent palace, and he gave her, in return, the celebrated diamond. He now travelled, married, and seemed to live happily. Potemkin, at this time, had become the lover of the empress. Orloff died in 1783, after having been for some time subject to periodical attacks of insanity.—*Alexis*, his brother, showed, during the revolution in 1762, great courage. Disguised as a coachman, he drove the empress from Peterhoff in a mean carriage. He was one of the murderers of Peter III; rose soon to high dignities in the army; and, in 1768, was made admiral of the Russian fleet in the Archipelago, with unlimited power, against the Turks, whom he defeated off Tschesme; for which exploit he was called *Tschesmenskoi*. He was yet in the fleet when his brother lost the favour of the empress. In Leghorn, he deceived the daughter of Elizabeth, and had her carried to Petersburg. When he returned, he was brilliantly received. When Paul I. ascended the throne, he and Baratinski, the only survivors of the reputed murderers of Peter III., were obliged to attend the removal of the body of the murdered emperor from the convent of Alexander Newski to the fortress, during which ceremony they had to bear the corners of the pall. He remained ever after in disgrace, and died in 1808.

ORLOFF, Gregory, count of, Russian senator, privy-counsellor and chamberlain, who distinguished himself in the sciences, was born in 1777, and was elevated to the senatorship in 1812. He was a member of many academies and learned societies, and died in 1826, at Petersburg. His chief works are *Mémoires historiques, politiques et littéraires sur le Royaume de Naples*, &c., with notes by Duval (2 ed., 5 vols., Paris, 1825,) translated into German, English, and Italian, and embracing the history of Lower Italy from the earliest times until 1820; *Histoire des Arts en Italie*, the two first volumes of which treat of music, the others of painting; *Voyage dans une Partie de la France, ou Lettres descriptives et historiques* (Paris, 1824.)

ORLOP; a platform of planks laid over the beams in the hold of a ship of war, whereon the cables are usually coiled. It also contains the sail-rooms, the purser's, surgeon's, boatswain's and carpenter's cabins, and the several officers' store-rooms. In three-decked ships, the second and lowest decks are sometimes called *orlops*.

ORMOND, Duke of. See *Butler, James*.

ORMUZD is one of the spirits mentioned in the Zendavesta. He is subordinate to the Zeroene Akerene (infinite and uncreated time,) from whom he receives his power. He is the first-born of all beings, produced by the mixture of original fire and water, infinite, immortal, incorruptible. He was represented as the king of the world, and sitting in the midst of heaven, upon a high throne, "the throne of the good and the perfect," surrounded by celestial spirits and the souls of the happy. He was called the *eternal source of sunshine and light*: the sun and moon received their brightness from him. He carried, as a badge, upon his hand a ring, the symbol of his supreme power, and is sometimes represented as crowned with rays. He is also described as a venerable old man, resting upon the primeval bull, the emblem of the whole organic creation.

ORNE; a department of France. See *Department*.

ORNITHOLOGY is that branch of natural science which treats of the feathered tribe, or, to use the definition of Cuvier, of vertebrated oviparous animals, with a double circulation and respiration, organised for flight. The symmetry and beauty displayed in the graceful forms and varied colours of this part of creation, strike the most casual and inattentive observer; and the wonderful adaptation of their structure to their peculiar habits and modes of living, is a source of constant admiration to the student of nature. Almost every peculiarity in the external appearance of birds is fitted for the element they inhabit, and conducive to swiftness of motion. Every part of their frame is formed for lightness and buoyancy: their bodies are covered with a soft and delicate plumage, admirably calculated to protect them from cold or moisture; their wings, although of the lightest materials, are furnished with muscles of such power as to strike the air with great force, and to impel their bodies forward with astonishing rapidity, whilst the tail acts as a rudder, by which their course can be directed at pleasure. Their internal structure is in perfect consonance with those external peculiarities. Their lungs are fixed against the ribs, and enveloped with a membrane pierced with large holes, which permit the air to pass into cavities in the breast, abdomen, and even into the interior of the bones. This conformation not only renders them more buoyant, but also prevents any interruption in their respiration, by the rapidity of their motion through a resisting medium, and increases their vital energy. Some idea may be formed of the capacity of birds for respiration from the fact stated by Lavoisier, that two sparrows consume as much air as a Guinea pig. The anterior extremities of birds, being solely fitted for the action of flying, are useless either for resting or grasping; hence these animals are biped, and take objects from the ground with their mouth, for which purpose the neck and beak are elongated and very movable; the body is also inclined forward beyond the feet; the thighs are in advance, and the toes of such a length as to form a sufficient basis. The pelvis is very long, to give origin to muscles supporting the trunk on the thighs, and a set of muscles pass from the pelvis to the toes, so arranged that the simple weight of the bird retains the toes in a flexed condition; in consequence, they are able to sit perched upon one leg with security, and without becoming fatigued. The posterior parts of the pelvis (in common language known as the *side-bones)* are elongated and separated, to give room for the development of the eggs. The bill of all birds consists of two mandibles, the upper and lower, the former being generally fixed and immovable, though in the parrots it has the power of motion to assist them in climbing. None of the feathered tribe have teeth, but the horny case which covers the mandibles supplies the place of these instruments, and is sometimes serrated, so as to resemble them. In some birds, as the falcons, the base of the beak is covered with a skin called the *cere*; and in the turkey, the carrier-pigeon, &c., it is covered with a carneous appendage. The bill is in some kinds straight; in others curved upwards or downwards; in some flat; in others conic, wedge-shaped, or hooked, &c. It enables the bird to take hold of his food, to strip or divide it, to carry materials for building his nest, or food to his young, and is a formidable weapon in the rapacious tribe. The nostrils are usually of an oval form, and placed near the base of the beak. The eyes are so disposed as to distinguish equally well near and distant objects, and their sense of sight is exceedingly acute. The sparrow-hawk discerns small birds from an incredible distance. Besides the ordinary eyelids, there is a third, called the *nictitating* membrane, which is translucent, and defends the eye of the bird from the direct rays of the sun, without obstructing the sight. Birds have no external ear, with the exception of the nocturnal tribes; these have a large exterior conch, in the form of a thin leathery piece of flesh. The internal ear, however, is very large, and their sense of hearing very quick. The brain of birds is distinguished by its great proportionate size, and appears to be formed of tubercles, and not of convolutions. Their digestive powers are very great: the stomach is composed of three parts—the *crop*, which is a thin membranous expansion; the *succenturium*, also a membranous pouch, furnished with a multitude of glands; and the *gizzard*, which is provided with two strong muscles, covered inside by a velvet-like cartilage; here the food is ground, or triturated, and its action is aided by the presence of small stones, which birds swallow for that purpose. The coverings or feathers of birds are admirably calculated for security, warmth, and celerity of motion. They are of three kinds; down, smaller feathers, and quills (*floccæ, plumæ et pennæ*.) The feathers which invest the body have small shafts and large vanes, and are placed over each other like shingles, so as, at the same time, to permit the water to run off and to exclude the cold. The down is placed under these, and serves as a further protection against the cold: hence it is most abundant in those species that inhabit the polar regions. The quill feathers are principally found in the wings and tail. The vanes, which in the wing feathers are broad on one side and narrow on the other, consist of a number of small *laminæ*, which are connected by the interlacement of a multitude of minute bristles. The largest quill-feathers in the wing, or those nearest the extremity, are termed *primaries;* those which arise from the fore-arm are called *secondaries;* and the weaker feathers attached to the *humerus* are designated as *scapulars*. The quill-feathers of the tail are large and strong, having their vanes almost equal in size: they are generally twelve in number, but sometimes, especially in the gallinaceous birds, eighteen or twenty. The feathery covering of birds constitutes their peculiar beauty: on this, nature, particularly in the warmer climates, has lavished the most splendid colours. The size of the wings is not always in proportion to the bulk of the bird, but is accommodated to its manner of living. Accordingly, birds of prey, swallows, and, in general, such birds as are intended to hover a long time in the air, have much longer wings, in proportion to the size of their bodies, than quails, domestic hens, &c. In the ostrich, the cassowary, and the penguin, the primaries are wanting entirely. The flight of birds differs very much from that of bats, insects, and other volant animals. Many birds, as falcons, soar boldly above the clouds, whither no eye can follow them, and hover for many hours, without perceptible exertion, in the air. Likewise swallows, larks, and some other kinds of birds, sail to considerable distances with little effort; others, as sparrows, have a fluttering flight. Some, as the owls, fly without any noise; others, as the partridge, &c., with a loud whirr. The flight of a young bird resembles the tottering steps of an infant. You see distinctly how anxiously he seeks for the nearest resting-place, and how soon he is tired. The tail serves as a rudder in most birds; the long legs of the cranes and other waders appear to serve the same purpose. The legs in different genera of this class are so diversified in shape, that many naturalists have considered these differences sufficient for distinguishing marks of different orders. Being adapted either for resting upon trees, for swimming or running, they answer exactly to the wants of each species. From their food, manner of life, and locomotive powers, birds would seem destined to become inhabitants of every part of the globe; and, in fact, the cold and barren regions of the north and the sultry plains of the tropical climates, become the alternate residence of the same birds at different seasons of the year. At particular times in the year, most birds remove from one country to another, or from inland districts to the sea side. The periods of these migrations are observed with wonderful accuracy, though they are somewhat regulated by the temperature of the seasons. Some species, however, are stationary, as many of the birds of prey. (For a particular account of the migration of birds, see the article *Migration of Animals*.) The food of birds, like that of quadrupeds, is derived from the animal and vegetable kingdoms, and, like them, they may be divided into the granivorous and carnivorous, and some which hold a middle rank; and their dispositions and habits, as in quadrupeds, are influenced by the nature of their food: whilst the carnivorous are fierce and untameable, the granivorous are mild, gentle, and easily domesticated; their flesh, also, is more wholesome and palatable. Birds, however, are more indiscriminate in their food than quadrupeds, and more frequently supply the deficiency of one kind of food by another; and in the young state almost all kinds are carnivorous or rather insectivorous. In mental capacity, birds fully equal quadrupeds, and, in some respects, surpass them. Parrots, starlings, &c., retain in memory many words and phrases which they have been taught, and many singing birds whole melodies. Their powers of memory seem also to be evinced by the fact that birds of passage, after an absence of six months, or even a longer time, and after travelling thousands of miles, return to their former home; the swallow to her beam, the finch to the tree where last year she reared her young, or where she herself was hatched. The difference between such birds as love to dwell in uninhabited places, secure from persecution, and such as are found in the neighbourhood of men, surrounded by dangers, is a proof that their prudence, cunning, and docility can be awakened and improved. The field sparrow is less cunning than the house sparrow, which has daily opportunity to observe the hostile intentions of man. In desert countries, birds will alight upon the barrel of the hunter's gun, when he levels it against them, whilst with us a mere stick borne upon the shoulder excites the suspicions of the wild goose. The voice is a peculiar gift of nature, by which the greater part of birds are distinguished from all the rest of the animal world. The windpipe of birds is composed of entire rings of cartilage, with an exception in the case of the ostrich. At its bifurcation is a glottis supplied with appropriate muscles, called the *lower* or *inferior larynx*. It is here that the voice of birds is formed; the vast body of air contained in the air-cells contributes to the force, and the windpipe, by its form and movements, to the modification of the voice. The superior larynx is very simple and unimportant. The gift of song is given to the male birds only, and their notes are mostly an expression of love; hence they are heard singing chiefly at the time when they are pairing. The birds sing only when they are cheerful. In sadness, during rough weather, and in bodily disorders, they are silent. It is commonly said that the gift of song is confined to the birds in northern climates, and that nature, in the warmer regions, has endowed them, instead, with more brilliant colours; but Foster relates, that in Otaheite the birds sing with charming sweetness; and Cook, on his first voyage, found the forests of Queen Charlotte's sound, in New Zealand, filled with little birds, whose voices sounded like silver bells. To no other animal have such various tones been granted for giving utterance to different feelings; hunger, fear, the dread of imminent danger, desire for society, or longing for his mate, love, melancholy, &c., are expressed by a variety of notes, which make a language intelligible not only to birds of the same species, but often to the other tribes. When one of the songsters of the wood perceives a bird of prey, the whole forest grows silent at his warning voice. Birds are spread over the whole earth; a few species extend even from the polar circles to the tropics: their places of abode are suited to their wants and peculiarities, and embrace rocks and dens, trees and shrubs, earth and water. Whilst wood-peckers and parrots pass all their time upon trees, partridges, quails, &c., remain on the ground; storks and herons visit the marshes; swans and water-fowl live in rivers and ponds. Birds are in general, very long-lived, although their growth is rapid, and their period of procreation very early. In quadrupeds, the duration of life usually bears a certain proportion to the period at which they attain their full powers; but it is very different with birds. A cock arrives at maturity in a year, and yet has been known to live upwards of twenty years; a linnet fourteen; parrots forty; and eagles a hundred years. From this longevity of birds, it is probable that they are subject to few diseases. The only one which is universal to them, if it can be termed a disease, is moulting, or the operation of changing their plumage, during the continuance of which, they are sickly and disordered, and many die. This process, which occurs every year, appears to be performed in the following manner:—When the feathers have attained their full size, the pen part, nearest the bird, grows harder, and shrinks in its diameter, thus gradually compressing, and finally obliterating the vessels which supply it with nourishment, and thus becomes an extraneous body, which is at last loosened in its socket, and falls off. Whilst these changes are taking place, the rudiments of the new feather are forming beneath, which rapidly attains its natural size, after it has been protruded through the skin. This process, it will be seen, is very analogous to the annual shedding of the horns in the deer tribe. (See *Deer*.) Most birds pair at certain seasons, and continue this conjugal union whilst the united efforts of both are necessary in the formation of their temporary habitations, and in the rearing and maintenance of their offspring. Some birds, however, especially among those of prey, continue their attachment to each other for a much longer period; sometimes even for life. In general, birds are more prolific than quadrupeds, and their productiveness is visibly increased by domestication. There is a remarkable circumstance connected with this subject, and which is peculiar to the feathered race—a bird, when she has produced her usual number of eggs, ceases, in ordinary cases, to lay. If, however, by any accident, these eggs are destroyed, she will again lay the same number. This is strongly marked in the common hen, who, if her eggs are constantly taken away, does not begin to hatch, but goes on producing eggs to an almost indefinite extent. The ovation of birds is considered as an important part of their history, and is closely attended to by writers on ornithology. Almost all birds incubate, or hatch their eggs, by keeping them at a uniform temperature by brooding over them. The ostrich and cassowary, however, do not perform this maternal duty, merely depositing their eggs in the sand, and leaving them to be hatched by the heat of the sun. (For the process of incubation, see *Incubation*.) Before laying, all other birds are directed by instinct to the operation of building a nest or habitation for their young. The nidification of birds has deservedly been a subject of much admiration; for they construct these temporary habitations with such exquisite skill as to exceed the utmost exertion of human ingenuity to imitate them. Their mode of building, the materials employed, and the situations selected, are as various as the different kinds of birds, and yet are all admirably adapted to their several wants and necessities. They conceal them carefully from the eyes of rapacious animals and of men, and their caution is greater in proportion to the dangers by which they are surrounded. The materials are carefully selected, and are generally united with great art. In the larger number of species, the female is the principal builder, whilst the male carries the materials. To give a detailed account of the construction of nests, would swell this article beyond all due bounds. Those who wish for full information on this interesting subject, will find it pleasingly and elaborately detailed in Rennie's Architecture of Birds. When the building is finished, the female lays her eggs: several water-birds lay but one, birds of prey two, crows and ravens four, the titmouse from eight to twelve, domestic hens forty to fifty. The eggs differ in size, form, colour, &c., according to the peculiarities of each species. After the warmth of the brooding female (in many species the male assists the female in this business) has developed and matured the germ in the egg, the young break out of the shells, and the love, tenderness, and care now shown by the parents are admirable. The mother warms the naked brood under her wings, whilst the father brings the choicest food. The feeble swallow defends herself and her young ones, or dies together with them; the domestic hen runs along the pond with cries of anguish when the young ducks which she has hatched, have been carried by their instinct into the water. When the young are produced, the next object of parental care is their protection and support; and these duties are fulfilled with astonishing spirit and industry. The most timid become courageous in defence of their progeny, and willingly expose themselves to danger to shield their tender and helpless offspring. The young of those birds who build on the ground are generally able to run soon after they are excluded from the shell, and the mother's care is confined to leading them to their food, and teaching them how to collect it. It is far different with those hatched upon trees; they remain in the nest for a long time, during which both parents are sedulously employed in providing them with a regular supply of food. When their plumage is fully grown, they are gradually taught to fly, and, qualified to provide for themselves, the parents forsake them, as no longer needing their care. Birds, although the most marked of all the classes of animals, resemble each other so closely in their specific characters, that their subdivision is extremely difficult. Like the mammalia, their distribution into orders is founded on the organs of manducation and those of prehension. From the difference of these organs, naturalists have arranged birds in various orders. The following is that adopted by Cuvier in the last edition of his Animal Kingdom:—1. Birds of Prey (*accipitres*, Lin.); distinguished by their crooked beak and claws, by means of which they are enabled to overcome and prey upon other birds, and even the weaker quadrupeds. They hold the same rank among birds as the *carnivora* among quadrupeds. They all have four toes, and the nails of the great and middle toes are the strongest. They form two families, the diurnal and nocturnal: the first having nostrils inserted in a naked cere, three toes before and one behind, without feathers; eyes directed sideways: the second having nostrils at the anterior edge of the cere, which is more or less covered with stiff hairs; the external toe capable of being turned behind; eyes large, directed forwards.—2. **Passerine** (*passeres*). This is the largest class, and embraces all birds which do not belong to the other five; they present a great resemblance in their structure, and the genera are so closely allied that it is difficult to distinguish between them. They may, however, be separated into two great divisions; 1. those with the exterior toe united to the middle one, by one or two joints only; 2. exterior toe almost as long as the middle one, and united to it as far as the last joint but one.—3. **Climbers** (*scansores*); birds whose exterior toe directs itself backwards like the great toe, affording a very solid support, by which some of them profit in clinging to, and climbing the trunks of trees.—4. **Gallinaceous Birds** (*gallinaceæ*). These have a heavy gait, a short flight, a medium-sized beak, the upper mandible vaulted, nostrils partly covered by a cartilaginous scale, toes generally dentated at the edges, with short membranes between those in front.—5. **Waders** (*grallæ*) may be recognised by the nudity of the lower part of their thighs, very frequently the length of their legs, generally some little web, at least, between the external toes. In flying, they extend their legs behind them, contrary to the habit of other birds, who draw them up close to the body.—6. **Web-Footed Birds** (*palmipedes*) are strongly characterized by their feet, formed for swimming, that is, being affixed to the hinder part of their body, with very short and compressed tarsi; and palmated between the toes. They are the only birds in which the length of the neck exceeds that of the legs.—Each of these orders is subdivided into families and genera, principally according to the formation of the beak.

While we have thought it proper to give a brief outline of Cuvier's classification of Birds, we adopt the system of Temminck, with the addition of some new genera. This arrangement is simple and distinct, and but slightly altered from that of Linnæus. He separates the class Aves or Birds into sixteen orders, with the following characters:—

I. **Rapaces.**—Birds of prey.
II. **Omnivores.**—Such as live on all kinds of food.
III. **Insectivores.**—Those which feed principally on insects.
IV. **Granivores.**—Birds which feed on grain.
V. **Zygodactyli.**—Those having two toes before, and two behind, pl. 72, f. 43.
VI. **Anisodactyli.**—Those which have the middle toe joined to the exterior one at the base, pl. 72, f. 42.
VII. **Alcyones.**—Those having three toes before united, and one behind, pl. 72, f. 44.
VIII. **Chelidones.**—Having short legs, three toes before divided, or only united at the base by a short membrane; the hinder toe often reversable, pl. 72, f. 46.
IX. **Columbæ.**—Those which have three toes before, entirely separated, and one behind.
X. **Gallinæ.**—Having three toes before, entirely separated; the hinder toe united to the tarsus above the joint of the other toes.
XI. **Alectorides.**—Birds having a long and slender tarsus; three toes before and one behind; the hinder toe articulated higher on the tarsus than those in front.
XII. **Cursores.**—Birds with long legs, naked above the knee, with two or three toes directed forwards, pl. 72, f. 45 and 49.
XIII. **Grallatores.**—Those birds which have long and slender legs, more or less naked above the knee; three toes before and one behind, the hinder one jointed on the same level with the others, or more elevated.
XIV. **Pinnatipedes.**—Birds with feet of medium length; the tarsi slender or compressed; three toes before and one behind, with a rudimentary membrane along the sides of the toes; the hinder one joined interiorly to the tarsus, pl. 72, f. 62.
XV. **Palmipedes.**—Those which have short feet, more or less drawn up to the abdomen; anterior toes partly or wholly united by a membrane; the posterior toe articulated interiorly upon the tarsus, or totally wanting in some genera, pl. 72, f. 47.
XVI.—Birds whose legs are retracted into the abdomen; feet with three toes divided in front; the hinder toe short, and articulated anteriorly, pl. 72, f. 48.

TERMINOLOGY OF THE PARTS OF BIRDS.

Of the Skeleton. Pl. 72, f. 39.

a a. The vertebræ of the neck, or cervical bones.
b. The metacarpal bones.
c. The phalanges.
d. The Ulna.
e. The metacarpal bone of thumb.
f f. The ball of the Ulna.
g. The radius.
h. The os humeri.
i. The atlas.
k. The ribs.
l l. The tibia, or thigh-bone.
m. The fibula, or leg-bone.
n. The ball of the tarsus.
o. The tarsus.
p p. The phalanges of the toes.
q. The phalanges of the heel.
r. The sternum, or breast-bone.
s s. The clavicle, or collar-bone.
t. The last true rib.
u. The vertebræ of the back.
v. The pelvis.
w. The vertebræ of the tail.
x. The os coccygis.

External Anatomy of Birds. Pl. 72, f. 41.

Parts of the head and neck.
a, b, g. Upper mandible.
a to g. Culmen, or ridge of the bill.
g. Frons, or forehead.
h. Corona, or crown of the head.
i. Sincipnt, or hinder part of the head.
o. Nucha or nape of the neck.
k. Supercilium, or eyebrows.
m. The ear covers, or auricles.
d. Under mandible.
e. Barba, or beard.
R. Notch.
f. Mentum, or chin.
r. Gula, or gullet.
s. Jugulum, or lower part of the throat.
p. Auchenium, or lower part of the neck.

Back.
V V. Interscapulum, or space between the shoulder blades.
S S. Tergum, or middle of the back.
I. Uropygium, or rump.
H. The tail coverts.

Body.
t. Pectus, the breast.
W. Epigastrum, or stomach.
A A. Abdomen.
Z Z. Venter, or belly.
Y. Hypochondria, sides of the abdomen.
B. Crissum, or vent.

Wing.
D D. *Tectrices minores*, or lesser wing coverts.
E E. *Tectrices mediæ*, or middle wing-coverts.
Z Z. *Scapulares*, scapulars.
F. *Primariæ*, Primaries, or quills.
G. *Remiges*, or rowers.
X. *Alula spuria*, or bastard wing; f. 40, bone of do. at *d c*. feathers of do. *e*.
U. *Humeri*, or shoulder of the wing.

Tail.
K. *Rectrices intermediæ*, or middle tail feathers.
L. *Rectrices laterales*, or side tail feathers.

Legs.
M. Tibia, or thigh.
a. Tarsus, or shank.
Digiti, or toes.
P. P. Hallux, heel, or hind toe.
O O. Acrostarsium, or front of the leg.

The Bones of the Wing and their Feathers. Pl. 72, f. 40.

a. This wing bone is termed the Brachium, or arm.

b the cubitus, c the carpus, d the spurious wing bone, e the primaries, f the secondaries, g the tertials.

Examples of Bills. Pl. 72.

F. 53. A straight bill with an inflected point, genus *Vultur*.
F. 52. A straight bill, notched towards the point. *Barita*.
F. 50. A robust bill, serrated at the point of the upper mandible *Opæthus*.
F. 54. A robust notched bill. *Trogon*.
F. 55. A straight cuneate bill. *Corvus*.
F. 56. A cylindrical bill, with reflected serri. *Mergus*.
F. 57. A recurved bill. *Mycteria*.
F. 62. An elongated, compressed bill, with a turgid lip. *Scolopax*.
F. 59. A gibbous arcuated bill. *Psittacus*.
F. 60. A spatulate bill. *Platalea*.
F. 61. A groping bill. *Anastomus*.
F. 51. A straight, narrow bill, as in *Quiscalus*.
F. 58. A slender, curved, depressed bill. *Phalaropus*.

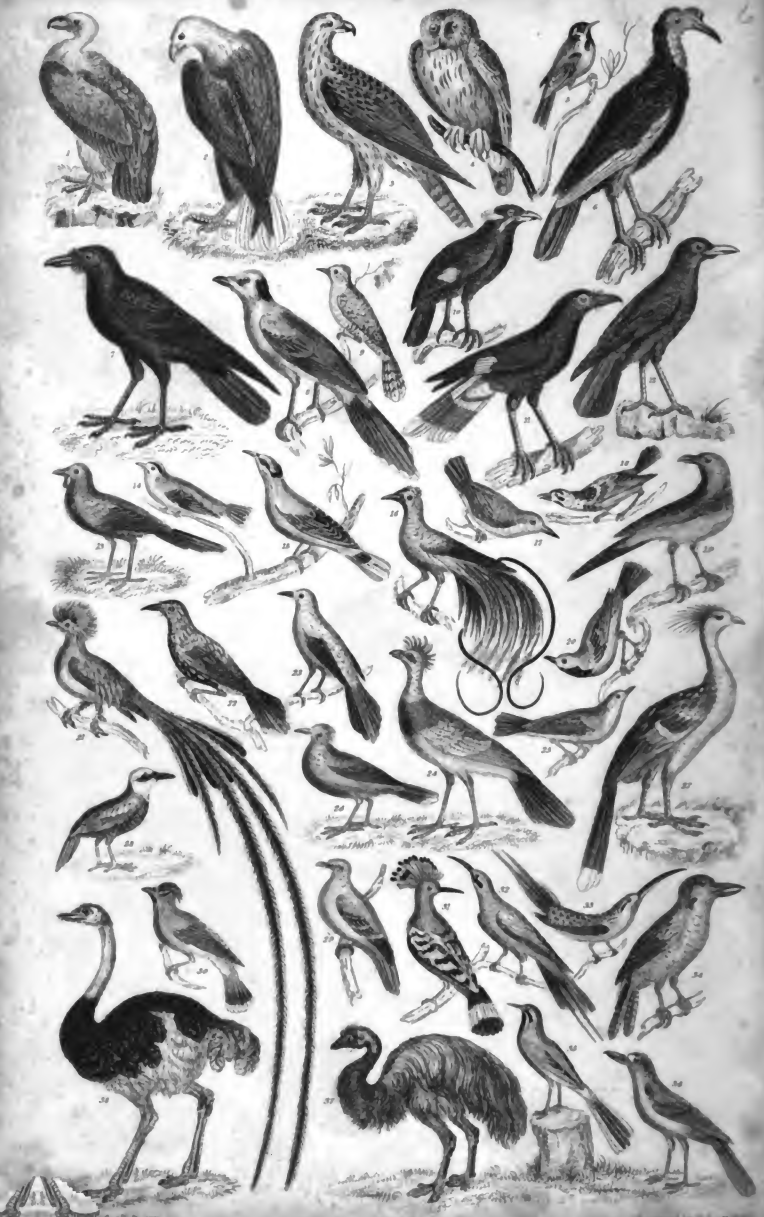
ORDER I.—RAPACES.

Bill short, strong; upper mandible covered at its base by a cere, compressed, and hooked towards its extremity; nostrils open; legs strong, muscular, generally short, and feathered to the knees or feet, with three toes in front, and one behind, either divided or united at the base by a membrane; middle toe longest, and united with the exterior one at the base.

Vultur fulvus. Griffon Vulture. Pl. 67, f. 1. Bill short, thick, deeper than broad, its base covered with a cere; upper mandible straight, hooked towards the point; under mandible

ORNITHOLOGY.

PLATE [illegible]



straight, rounded, and inclined at the tip; head divested of feathers, in some species covered with a short down; nostrils naked, lateral, opening diagonally towards the edge of the cere; legs robust, provided with slightly hooked claws; the middle toe largest, and united with the exterior one at the base.

Cathartes Papa. King of the Vultures. Pl. 68, f. 1. Bill long, straight, compressed, hooked towards the point; cere naked, covering half the beak; upper mandible tumid towards the tip; head oblong, which, with the upper part of the neck, is destitute of feathers; nostrils longitudinally cleft, placed in the middle of the bill, adjoining the ridge of the upper mandible, broad, and sometimes surmounted by fleshy appendages; legs more or less slender, with a naked tarsus; middle toe long, and united to the exterior one at the base.

Gypaetus barbatus. Bearded Vulture. Pl. 68, f. 9. Bill long; upper mandible arcuated towards the point, and beak like a hook; nostrils oval, covered, with bristly hairs directed forwards; feet short, three anterior toes united by a short membrane, the middle one considerably longer than the others; nails slightly hooked; wings long.

Gypogeranus Serpentarius. Secretary. Pl. 68, f. 3. Bill thick, strong, shorter than the head, bent from its base, where it is provided with a cere, a little arcuated and compressed at its point; nostrils lateral, diagonal, open, somewhat separated at the base, situated in the cere; legs very long and slender; tibia feathered; tarsus long, naked, more slender at the base than above; toes short, verrucose below, the anterior ones united at the base; hallux articulated on the tarsus; wings long, armed with a spur, the first five quills longest, and nearly equal.

Polyborus vulgaris. Brazilian Caracara Eagle. Pl. 68, f. 6. Bill somewhat elongated, deep, and laterally compressed, upper mandible strongly hooked at the tip, base covered with a hispid cere; nostrils narrow, elliptical, somewhat oblique near the ridge of the beak; wings nearly equal to the tail in length, and fourth quills the longest; tarsus long and naked; claws of moderate length, slightly curved.

Falco Islandicus. Jerfalcon. Pl. 67, f. 3. Bill hooked, generally curved from its base, at which there is a coloured cere, partially covered with hairs at its base; mandibles notched in some species; nostrils lateral, open, oval, or roundish, situate in the cere; tarsus wholly or partly covered with feathers; toes strong, long, provided with long, sharp claws; wings long, the first quill and the third of equal length, the second longest.

Harpyia destructor. The Harpy Eagle. Pl. 68, f. 7. Bill strong, upper mandible very thick at the base, straight for a certain length, from whence it suddenly curves downwards with a strong arch towards the point, which is very sharp; lower mandible short, straight, and obtuse; nostrils transverse, oval; wings reaching to the middle of the tail; tarsus very strong, partially covered with feathers in front, strongly reticulated below.

Aquila fucosa. Wedge-tailed Eagle. Pl. 68, f. 2. Bill straight at the base, strong, greatly hooked at the point, compressed, with the sides inclining upwards, and forming a narrow ridge or culmen; nostrils oval, lateral, transverse; wings large, fourth and fifth quills the longest; tarsus clothed with feathers to the toes; toes short, the outer and middle ones united at the base by a membrane; claws strong, hooked, sharp, and grooved beneath.

Haliaetus leucocephalus. White-headed Eagle. Pl. 67, f. 2. Bill elongated, strong, straight at the base, curving in a regular arc in advance of the cere to the tip, and strongly hooked; culmen broad and flat; nostrils large, luniform, transverse, pierced in the cere; wings ample, the fourth quill the longest; tarsus half covered with feathers, front naked and scutellated, sides and back reticulated, toes divided their whole length; claws strongly hooked, and grooved beneath, claw of the hallux larger than that of the inner toe, which exceeds in length those of the middle and outer toes.

Astur atricapillus. Goshawk. Pl. 68, f. 13. Bill short, bent from its base, sides compressed, upper mandible with a lobe upon its cutting margin; nostrils oval, opening obliquely; wings short, hardly reaching the centre of the tail when closed, fourth quill longest, inner webs of the first five deeply notched, tarsus of medium length, scutellated in front; middle toe much longer than the other; hallux strong; claws strong, incurved, and sharp.

Buteo Americanus. American Hen Harrier. Pl. 68, f. 10. Bill rather slender, incurved from its base; upper mandible slightly sinuated, with an obtuse lobe, sides compressed; under mandible shallow, the tip obliquely truncated; cere large; nostrils pyriform, the narrow end turning upwards; wings long, first quill very short, not exceeding the seventh in length; the second shorter than the fifth; the third and fourth the largest in the wing, the first four with their webs deeply notched; tarsus short, naked in front, or feathered to the toes; toes short, united at the base; claws strong, but not much hooked.

Elanus furcatus. Swallow-tailed Hawk. Pl. 68, f. 12. Bill weak, of medium length, compressed, nearly straight at the base, and hooked at the tip; wings long, with the second feathers generally the longest, the first and second with their inner webs strongly notched; tail long, more or less forked; tarsus short, feathered half way down, naked part reticulated; claws strong, incurved; under surface in some species partly rounded.

Bubo nævia. Mottled owl. Pl. 68, f. 11. Bill short, strong, bent from the base, compressed towards the tip; nostrils large, oval, or rounded, placed in the upper part of the cere; facial disc small, somewhat incomplete about the eyes; head provided with tufts in the form of horns; auditory opening small, oval, destitute of an operculum; wings rather short, concave; third and fourth quill-feathers generally the largest; tarsus and toes clothed with feathers; outer toe reversible; claws long, moderately curved, and very sharp.

Noctua Dalhousei. Dalhousie's Owl. Pl. 17, f. 4. Bill bending from the base, much curved; cere short, in the anterior part of which the nostrils are placed; auditory conch large, with a narrow operculum; facial disc complete; wings of medium length, ample and rounded; the third and fourth quills longest, and nearly equal; inner webs of the first primaries notched; tail slightly rounded, and longer than the wings when closed; tarsus and toes more or less feathered; claws moderately incurved; the inner and middle one grooved, and the outer one and the hallux nearly cylindrical.

ORDER II.—OMNIVORA.

Bill of medium size, robust, sharp at the edges; upper mandible more or less convex, and notched near the point; feet provided with four toes, three before, and one behind; wings of medium size, with the quill-feathers terminating in a point.

Opisthocomus cristatus. Crested Hoatzin. Pl. 67, f. 27. Bill short, thick, convex, bent at the point; base laterally dilated; lower mandible strong, with an angular termination; nostrils situate in the middle of the bill, covered by a membrane; legs strong; tarsus shorter than the middle toe; toes bordered by rudimentary membranes; first quill of wing short; the four next graduated, and the sixth longest.

Buceros Abyssinicus. Abyssinian Hornbill. Pl 67, f. 6. Bill very large, long, convex, curved, and sharp at the edge, and serrated at the margin, with a horny protuberance near the base of the upper mandible rising into a crest; nostrils behind the base of the bill covered by a membrane; legs short, strong; lateral toes equal, the external one united to the second joint; first three wing quills graduated, the fourth or fifth longest.

Prionites ruficapillus. Red Headed Saw-Bill. Pl. 69, f. 6. Bill medium size, strong; head convex above, bent and compressed towards the point; edges of both mandibles serrated; nostrils basal, lateral, oblique, open, partly concealed by feathers; toes lateral, unequal, the internal one very short, joined at its base; external united to the second joint; wings short, first three quills graduated, the fourth and fifth longest.

Corvus Corax. Raven. Pl. 67, f. 7. Bill straight at the base, thick; sides compressed, bent towards the point, and edged; nostrils oval, open, placed at the base of the bill, covered by reflected bristly feathers; wings pointed; the first quill shorter than the others, the third and fourth longest; tarsus and feet strong, plated, with three toes before, and one behind; claws strong, curved; toes divided; tarsus longer than the middle toe.

Garrulus Canadensis. Canada Jay. Pl. 67, f. 8. Bill shorter than the head, conical, slightly compressed, strait at the base, rather reflected towards the tip, which is faintly emarginate; lower mandible of nearly equal thickness, its culmen equally convex with that of the upper; nostrils basal, lateral, covered by short cetaceous feathers; wings rounded, first quill short, the fourth, fifth, and sixth, of nearly equal length, and longest in the wing; tail of medium length; tarsus longer than the middle toe, outer toe joined at its base to the middle one, and longer than the inner; hallux strong, with a dilated sole; claws stout, moderately curved, and sharp.

Quiscalus Versicolor. Purple Grakle. Pl. 67, f. 23. Bill straight, strong, smooth, somewhat compressed at the base; edge angular, bent inwards; upper mandible forming an acute angle, with the feathers of the head tapering towards its point; nostrils dilated, oval, covered by the membrane; tarsus annulated; middle toe attached to the exterior one, the length of the first joint, but quite separate from the interior one; wings medium length; first and fifth quills of equal length, the third and fourth the longest; tail with twelve feathers.

Nucifraga guttata. Speckled Nutcracker. Pl. 67, f. 22. Bill long, straight, narrowed at the point; upper mandible rounded, longer than the under, both terminated in an obtuse, depressed tip; nostrils basal, round, open, and concealed by protruding hairs; three toes before, and one behind; tarsus longer than the middle toe; wings accuminated, fourth quill-feather longest.

Pyrrhocorax alpinus. Red-legged Crow. Pl. 67, f. 12. Bill of medium size, slender, compressed, bent, smooth, and slightly notched; nostrils basal, lateral, ovoid, entirely concealed; tarsus strong, longer than the middle toe; toes almost wholly separated; claws strong, bent; wings cuneiform, the fourth and fifth quills longest.

Barita eructica. Noisy Roller. Pl. 67, f. 11. Bill long, strong, convex above, notched at the point, destitute of a basal furrow; nostrils lateral, pierced longitudinally in the bill, covered above, and half closed by the corneous substance; legs strong; tarsus longer than the intermediate toe; external toe united to the first joint, the internal one free; hallux long, strong; wings of medium size or long, the fourth or sixth quill longest.

Glaucopis cinerea. Wattle Bird. Pl. 67, f. 13. Bill of medium length, thick and stout; upper mandible convex, arcuated, curved towards the point, covering the edges of the lower, at the base of which is a fleshy membrane or wattle; nostrils basal, lateral; legs strong; tarsus longer than the middle toe; hallux with a long and crooked nail.

Gracula religiosa. Sacred Mino. Pl. 67, f. 10. Bill of medium length, strong, greatly compressed, convex above, narrow at the point, where it is notched in some species; nostrils lateral, open, partly concealed by the facial feathers; legs strong; tarsus length of the middle toe, the external one joined at its base, the internal one free; hallux short; third wing-quill longest.

Bufaga rufescens. Reddish Oxpecker. Pl. 67, f. 19. Bill medium sized, strong, thick, obtuse; lower mandible stronger than the upper, both gibbous at the point; nostrils basal, half closed by an arched membrane; tarsus longer than the middle toe; wings of medium size, first quill very short, the second almost as long as the third.

Bombycivora cedorum. Cedar Bird. Pl. 67, f. 30. Bill short, strait, broad at the base; upper mandible slightly curved at the point, with a small notch; nostrils basal, ovoid, open, concealed by protruding bristles; three toes before, and one behind, the exterior joined to the middle one; wings of medium size, first and second quills longest.

Ptilonorynchus nuchalis. Ruffed Ptilonorynchus. Pl. 69, f. 20. Bill short, strong, depressed at the base, bent, notched at the point; lower mandible gibbous in the centre; nostrils basal, lateral, round, concealed by the feathers; legs short, strong; tarsus longer than the middle toe, which is attached to the exterior one by the first joint; hallux strong, curved; the fourth and fifth wing quills longest.

Coracias viridis. Green Roller. Pl. 69, f. 5. Bill straight, compressed, higher than broad, upper mandible bent towards the point; nostrils linear, lateral; legs short, strong, formed for walking; three toes before, and one behind, entirely divided; wings long, first quill somewhat shorter than the second.

Colaris Afra. African Colaris, or Roller. Pl. 69, f. 12. Bill short, strong, depressed, sides dilated, much broader than deep, ridge rounded, point a little hooked, some species having a notch, and others not; lower mandible concealed by the margin of the upper; nostrils basal, long, cleft diagonally, half shut by a membrane which is covered with feathers; legs short; tarsus shorter than the middle toe, anterior toes joined at their base; wings long, second quill longest.

Oriolus Sinensis. Chinese Oriole. Pl. 67, f. 15. Bill form of a lengthened cone, horizontally compressed at the base, and marginated; upper mandible surmounted by a ridge, notched at the point; nostrils basal, lateral, naked, and horizontally pierced in the membrane which is large; tarsus same length as the middle toe, shorter in some species, and middle toe joined to the exterior one; first wing-quills very short, the third longest.

Icterus Phœniceus. Red-winged Troupial. Pl. 69, f. 2. Bill as long or longer than the head, straight like an elongated cone, pointed, sharp, somewhat compressed, destitute of a distinct ridge or notch, base covered by feathers; margins of mandibles more or less incurvated; nostrils basal, lateral, and covered by a horny rudimentary membrane; tarsus as long, or longer, than the middle toe; wings long, third and fourth quills longest.

Yephantes spurius. Orchard Baltimore. Pl. 69, f. 4. Bill nearly straight, entire, edge straight, a little sharp and thin; base of upper mandible forming an angle in front; nostrils dilated, and covered by a membrane; tongue cartilaginous, fringed at its extremity; tarsus naked, annulated; middle toe attached to the base of the exterior one, and totally separated from the interior; wings of medium length; second and third quills the longest.

Sturnus unicolor. Sardinian Starling. Pl. 69, f. 1. Bill straight, form of an elongated cone, depressed and slightly obtuse, base of upper mandible projecting on the forehead, the point much depressed, and destitute of a notch; nostrils basal, lateral, half closed by an arched membrane; wings long, first quill very short, the second and third longest; three toes before, and one behind; the exterior joined at its base to the middle one.

Pastor cristatellus. Chinese Pastor. Pl. 67, f. 26. Bill the form of an elongated cone, slightly arcuated; edge greatly compressed, point with a small notch; nostrils basal, lateral, ovoid, half closed by a membrane, furnished with small feathers; legs strong; three toes before, and one behind, the exterior joined at the base to the middle one; first quill of wing very small, the second and third longest.

Paradisea rubra. Red-tailed Bird of Paradise. Pl. 67, f. 16. Bill of medium length, straight, quadrangular, compressed, pointed, somewhat convex above; ridge between the feathers of the forehead; nostrils basal, marginal, open, but entirely concealed by the feathers; legs short; tarsus longer than the middle toe; lateral toe unequal, the internal one united to the second joint; hallux strong, longer than the toes; first five wing-quills graduated, the sixth and seventh longest.

Ptiloris Paradiseus. New Holland Ptiloris. Pl. 69, f. 21. Bill long, greatly arcuated, upper mandible unequal, and notched near the tip; nostrils basal, nearly concealed by the feathers of the forehead; tarsus short and strong; feet with three free toes in front, and a very strong hallux, the middle toes longest; claws strong and hooked; first quill of wings the longest.

Lamprotornis gularis. Gorget Bird of Paradise. Pl. 68, f. 4. Bill of medium size, convex above, compressed and notched at the point; base depressed, a ridge between the feathers of the forehead; nostrils basal, lateral, ovoid, half closed by an arched membrane, frequently covered by feathers; legs long; tarsus longer than the middle toe; internal toe joined at its base, the external one free; fourth and fifth wing-quills longest.

ORDER III.—INSECTIVORA.

Bill of medium size, or short, straight, rounded, or awl-shaped, slightly edged; upper mandible curved and notched at the point; frequently provided at the base with coarse protruding hairs; feet with three toes before, and one behind, articulated on the same level, the exterior united at its base, or to the first joint of the middle toe.

Merula livida. Cat Thrush. Pl. 69, f. 13. Bill of medium size, sharp-edged, compressed and recurved at the tip, upper mandible notched near the point; at the opening of the mandibles, there are long bristles; nostrils basal, ovoid, lateral, half concealed by a naked membrane; tarsus longer than the middle toe, to which last the exterior one is united at its base.

Chloropsis gampsorhynchus. Hook-billed Chloropsis. Pl. 69, f. 22. Bill of medium size rather slender, tapering, incurvated, acute, trigonal at the base, compressed at the middle and point; edges of the mandibles turned inwards; nostrils basal, lateral, membrane naked; wings rounded, of medium size, first quill short, second and third longer, the fourth and fifth the longest, and nearly equal; tarsus and toes short, the external and middle one attached at the base; hallux strong, nails sulcated, compressed, incurved.

Cinclus superciliosa. Supercilious Dipper. Pl. 67, f. 28. Bill rather slender, slightly recurved, compressed at the sides; point of the upper mandible bent over the lower one; nostrils basal, lateral, longitudinally cleft, and partly covered by a membrane; three toes before, and one behind; the exterior joined at its base to the middle one; tarsus longer than the middle toe; wings short.

Menura Novæ Hollandiæ. New Holland Menura. Pl. 69, f. 3. Bill straight, broader than deep at the base, somewhat slender, bent and notched at the point, the base with protruding setaceous plumes; lower mandible shorter than the upper; nostrils placed in the middle of the bill, large, oval, and covered by a membrane; claws as long as the toes, broad, obtuse, convex above; wings short, concave.

Pitta cyanura. Blue-tailed Pitta. Pl. 69, f. 8. Bill of medium size, strong, hard, compressed; slightly inclined from its base, and bent and notched at the point; ridge elevated at its base; nostrils basal, lateral, half closed by a naked membrane; legs long, slender, tarsus double the length of the middle toe; the internal toe united at the first joint; wings short, rounded, the three first quills equally graduated, the fourth and fifth the longest; tail short, equal, or rounded.

Myiothera fusca. Brown Antcatcher. Pl. 69, f. 10. Bill long, straight, convex above, the ridge somewhat arched, and bent abruptly at the point, lower mandible conical, and a little turned up at the point; nostrils basal, lateral, half concealed by a membrane; legs long, slender, or of medium length; lateral toes nearly equal, the internal one united to the first joint; wings short, rounded, the fourth and fifth quills longest; tail short, equal, or long and graduated.

Thamnophilus olivaceus. Olive Bush-Shrike. Pl. 67, f. 25. Bill short, robust, thick, somewhat gibbous, expanded at the base, dilated at the sides, compressed towards the point, which is obtuse, greatly bent, and notched; nostrils situate a little from the base, lateral, rounded, or oval, open, pierced in the horny substance of the bill; tarsus longer than the middle toe; external toe united to the first joint; wings short, rounded, the fourth, fifth, and sixth quills longest and equal.

Vanga cristata. Crested Vanga. Pl. 69, f. 7. Bill long, hard, margined, much bent at the point, and sharp; nostrils a little distant from the base, lateral, and pierced in the horny substance, covered above by a cartilage; base of bill with stiff hairs; tarsus as long, or longer than the middle toe, external toe united to the first joint; the third wing-quill longest.

Lanius excubitor. Great American Shrike. Pl. 69, f. 11. Bill of medium size, strong, straight from its base, and greatly compressed; upper mandible much bent towards the point, which is hooked, and strongly notched, base destitute of a cere, provided with strong, protruding hairs; nostrils basal, lateral, nearly round, and half closed by a membrane, and frequently half concealed by hairs; tarsus longer than the middle toe; three toes before, and one behind, separate; third and fourth wing-quills longest.

Psaris Vieilloti. Vieillot's Psaris. Pl. 69, f. 23. Bill short, thick, conical, round, hard, ridged, depressed at the base, compressed at the point, which is hooked and notched, destitute of a nasal furrow; nostrils remote from the base, lateral, round, open, and pierced in the corneous substance; legs strong; tarsus short, length of the middle toe; external toe united to the first joint, the internal one at the base; wings of medium size, the third and fourth longest.

Sparactes cristatus. Crested Sparactes. Pl. 69, f. 24. Bill strong, thick, somewhat depressed at the base, sides much dilated, destitute of a projecting ridge, point somewhat bent, compressed, and slightly notched, with a distinct nasal furrow; lower mandible strong, broad, with an obtuse point; nostrils basal, lateral, situate in a furrow of the corneous substance; tarsus strong, and longer than the middle toe.

Ocypterus viridis. Madagascar Ocypterus. Bill somewhat depressed at the base, with the point compressed and notched; upper mandible convex above, and bent at the point; nostrils lateral, distant from the base, pierced in the corneous substance, concealed by short hairs at the base; legs and toes short; wings long, the second and third quills longest and equal.

Tricophorus barbatus. Bearded Tricophorus. Pl. 68, f. 2. Bill short, strong, conical, compressed at the point, dilated at the base, and bristled; upper mandible bent, and slightly notched towards the point; tarsus shorter than the middle toe, the external one united to the second joint; fourth, fifth, and sixth wing-quills longest.

Edolius cristatus. Crested Edolius. Pl. 69, f. 25. Bill strong, depressed and bristled at the base, and compressed at the point, upper mandible convex, bent, and hooked at the point; nostrils basal, lateral, half covered with the bristles and feathers; tarsus short, slender; fourth, fifth, and sixth wing-quills longest; tail more or less forked.

Ceblepyris niger. Black Ceblepyris. Pl. 68, f. 17. Bill short, thick, strong, dilated at the base; somewhat tumid and compressed at the point; upper mandible arcuated, and hooked towards the point; lower mandible straight, nearly equal to the upper; nostrils basal, lateral, ovoid, concealed by close-set hairs; tarsus short and slender; lateral toes unequal, united at the base; fourth and fifth wing-quills longest.

Coracina gymnodera. Bare-necked Coracina. Pl. 69, f. 26. Bill straight, thick, angular, convex above, compressed, and tapering at the point, and slightly notched, with short hairs at the base; nostrils basal, roundish, open before, and closed behind by a feathered membrane; tarsus strong, shorter than the middle toe; fourth and fifth quill feathers longest.

Querula rubicollis. Purple Throated Querula. Pl. 68, f. 15. Bill depressed, triangular, both mandibles tumid; upper mandible sloping and hooked, and slightly notched towards the point; lower mandible very slender, and turned up at the tip; base provided with nuchal bristles; tarsus naked, annulated; the middle toe joined to the external one, length of first articulation, but totally separated from the interior, wings long, first and eighth quills equal; the second and sixth shorter, the fourth the longest of the whole; tail with twelve feathers.

Ampelis cærulea. Blue Chatterer, Pl. 69, f. 49. Bill short, somewhat depressed, deeper than broad; trigonal at the base, notched, and abruptly bent at the point; nostrils basal, lateral, rounded, half closed by a membrane; tarsus length of middle toe, sometimes shorter, lateral toes united to the second joint; second wing-quill longest.

Casmarhynchos variegatus. Variegated Chatterer. Pl. 69, f. 28. Bill broad, greatly depressed, soft and flexible at the base, corneous, compressed, and notched at the point; nasal furrow large, ovoid, open, placed near the point of the bill, and provided with small feathers; tarsus longer than the middle toe; third and fourth quills longest.

Procnias ventralis. Blue Berry-eater. Pl. 68, f. 8. Bill broader than the forehead, dilated on the sides, strong, depressed, and greatly compressed and notched at the point; ridge a little raised at the base; nostrils basal, tubular, bordered by a membranous circle; tarsus longer than the middle toe; second and third wing-quills longest.

Rupicola elegans. Elegant Rupicola Pl. 69, f. 13 Bill of medium length, strong, slightly arcuated, bent and notched at the point; lower mandible straight, pointed; nostrils basal, lateral, ovoid, concealed by the semicircular feathers of the tuft, tarsus strong, length of middle toe, and partly covered by feathers; external toe united beyond the second joint; first wing-quills filiform, much elongated.

Phibalura flavirostres. Yellow-billed Phibalura. Pl. 69, f. 29. Bill very short, somewhat conoid, convex above, and dilated on the sides; upper mandible notched at the point, lower one straight; nasal furrow very small, nostrils basal, covered by a membrane; first and second wing-quills longest; tail long, slender, and greatly furcated.

Pipra caudata. Fork-tailed Manakin. Pl. 69, f. 14. Bill trigonal, compressed and notched at the base, which is dilated: nostrils basal, lateral, open, half concealed by a feathered membrane; wings and tail usually short; two exterior toes united at about half their length; fourth and fifth wing quills longest.

Pardalotus striatus. Striated Manakin. Pl. 69, f. 48. Bill very short, thick, dilated at the base, with a distinct ridge, both mandibles equally strong, and of same length, convex, and somewhat obtuse, the upper one notched; nostrils basal, lateral, and covered by a membrane, tarsus slender, longer than the middle toe.

Todus viridis. Green Tody. Pl. 69, f. 16. Bill long, broader than deep, formed of two thin plates, with a distinct ridge; point of upper mandible straight, divided at the tip, the lower obtuse and truncated; nostrils open, rounded, base of mandibles beset with long hairs; toes lateral, unequal, the external one united to the third joint, and the internal one to the second, wings short, fourth quill longest.

Platyrhynchos collaris. Collared Platyrhynchos. Pl. 68, f. 11. Bill broader than the face, dilated on the sides, greatly depressed, point bent and notched; nostrils basal, round, or oblique, closed above by a feathered membrane; tarsus longer than the middle toe; exterior toe united to the middle one, to the first joint; nail of the hallux strong, hooked; third and fourth wing-quills longest.

Muscipeta regia. Coast Muscipeta. Pl. 69, f. 44. Bill greatly depressed, broader than deep; upper mandible with a sharp ridge, hooked and incurved on the lower, and generally notched; lower mandible much depressed, and sharp, base provided with long hairs, which frequently project beyond the bill; nostrils basal, open, lateral toes unequal, the external one united to the second joint; first three wing-quills graduated, the third and fourth longest.

Muscicapa Saya. Says Muscicapa. Pl. 67, f. 25. Bill strong, angular, depressed at the base, compressed and curved towards the point; base beset with long, stiff hairs; nostrils basal, lateral, ovoid, partly covered by hairs; tarsus length of the middle toe; lateral toes always equal.

Setophaga cærulea. Blue Gnat-catcher. Pl. 69, f. 45. Bill entirely depressed with an acute ridge, and beset with bristles at its base; fourth and fifth wing-quills equal, and a very little shorter than the second and third; tarsus long, slender, and naked, lateral toes equal, scarcely longer than the hallux, and considerably shorter than the middle one.

Vireo olivacea. Red-eyed Chat. Pl. 67, f. 25. Bill straight, long, abruptly bent and notched at the point, both mandibles compressed at the sides; nostrils basal, roundish; base of the bill with bristles; wings long, pointed; second and third quills equal and longest; first and fourth nearly equal; tarsus longer than the middle toe; the three anterior toes more or less connected at the base, interior one shortest; nails much curved and compressed; that of the hallux strongest.

Malurus Brownii. Brown's Malurus. Pl. 69, f. 36. Bill slender, deeper than broad; upper mandible slightly arcuated, base with small stiff hairs; nostrils basal, lateral; tarsus slender, exterior toe united to the second joint; wings very short, rounded; tail very long and slender.

Sylvia virens. Black-throated Green Warbler. Pl. 67, f. 20. Bill straight, slender, subulate, base deeper than broad; upper mandible with its point frequently notched, under one straight; nostrils basal, lateral, ovoid, partly covered by a membrane; tarsus longer than the middle toe; exterior toe joined at its base to the middle one; first wing-quills very short, second scarcely longer than the third.

Regulus Americanus. American Kinglet. Pl. 67, f. 14. Bill straight, slender, deeper than broad, compressed, the edges inflected; nostrils basal, with slender protruding bristles; first wing-quill short, second shorter than the third, which is the longest; tarsus longer than the middle toe.

Troglodytes palustris. Marsh Wren. Pl. 69, f. 42. Bill slender, slightly compressed, arcuated and emarginated; nostrils basal, half closed by a naked membrane; wings short and rounded, fourth and fifth quills of equal length, and longer than the others; tail short, rounded, erect; tarsus the length of the middle toe.

Saxicola rubicola. Stone Chat. Pl. 69, f. 46. Bill straight, slender, slightly carinated, and advancing upon the forehead; upper mandible a little bent above, and emarginate; nostrils basal, lateral, ovoid, partly concealed by a membrane; tarsus considerably longer than the middle toe; external toe joined to the middle one at its base; third and fourth quills longest.

Accentor alpinus. Alpine accentor. Pl. 69, f. 47. Bill of medium length, straight and strong, with an acute point; edges of mandibles compressed, the upper one emarginate; nostrils basal, naked, pierced in the membrane, which is large; tarsus strong; exterior toe united at its base to the middle one; third wing-quill longest.

Motacilla borealis. The Arctic Wagtail. Pl. 67, f. 35. Bill straight, subulate, slender, angular between the nostrils; edges of lower mandible compressed; nostrils basal, lateral, oval, partially concealed by a naked membrane; tarsus considerably longer than the middle toe; exterior toe joined to the middle one at the base; hallux strong and long in some species; tail very long, equal, horizontal; one of the greater coverts as long as the quills.

Enicurus coronatus. White-crowned Enicurus. Pl. 68, f. 22. Bill elongated, broad at the base; abruptly compressed towards the point; tip curved; nostrils situate in a groove, with an elevated membrane; tarsus slender; hallux short, strong; tail furcated.

Anthus rufulus. Reddish Pepit. Pl. 68, f. 46. Bill straight, cylindrical, slender, subulate near the tip, edges inflected towards the middle, base of upper mandible ridged, point slightly notched: nostrils basal, lateral, half closed by an arcuated membrane; hallux generally longer than the middle toe; third and fourth wing-quills longest.

Neops ruficauda. Red-tailed Neops. Pl. 68, f. 5. Bill slender, much compressed at the sides, entire and pointed; upper mandible straight, lower mandible shorter, curved downwards in the middle, and upwards at its tip, which is sharp; nostrils basal, oval, covered by a membrane; external and internal toes attached to the middle one as far as the first joint.

ORDER IV.—GRANIVORA.

Bill more or less conical, short, strong; culmen, or ridge, more or less depressed, advancing upon the forehead; mandibles generally destitute of notches; three toes before, and one behind, the anterior ones entirely divided; wings of medium length.

Alauda arvensis. Skylark. Pl. 69, f. 9. Bill short, subconic, mandibles of equal length, upper one slightly convex; nostrils basal, lateral, partly concealed by reflected feathers; claw of hallux much produced, nearly straight, first quill of wings short or wanting, third the longest; coronal feathers capable of being raised into a crest.

Parus ater. Coal Titmouse. Pl. 67, f. 5. Bill short, straight, robust, conical, compressed, pointed, base beset with small hairs; nostrils basal, rounded, concealed by projecting feathers; tarsus strong; toes divided to their origin, claw of the hallux large, and bent; first wing-quill of medium length, or nearly wanting in some species, fourth and fifth the longest.

Emberiza Lapponica. Lapland Long-spurred Bunting. Pl. 69, f. 41. Bill short, robust, conical, compressed, upper mandible narrower than the under one, edges of both sharp and inflected; nostrils basal, rounded, surmounted, and partly covered by the feathers of the forehead; toes divided; hallux with a short, bent claw; tail furcated, or slightly rounded.

Tanagra multicolor. Many-coloured Tanager. Pl. 69, f. 30. Bill short, strong, triangular at the base, carinated, greatly compressed and bent at the point; upper mandible longer than the under; edges of the mandibles inflected; under mandible straight, and somewhat gibbous towards the middle; nostrils basal, lateral, rounded, partly concealed by projecting feathers; tarsus length of middle toe; external toe joined at its base, the internal one free; second and third wing-quills longest.

Saltator olivaceus. Olive-coloured Saltator. Pl. 68, f. 25. Bill thick at the base, robust, convex above, sides laterally compressed; upper mandible arcuated, embracing the sides of the lower mandible, curved and notched at the point; lower mandible straight, somewhat shorter than the upper one; nostrils basal, small, and open; middle toe united to the base of the exterior one, interior quite free; wings of medium length, the first and fourth quills longest.

Ploceus personatus. Masked Weaver. Pl. 69, f. 31. Bill conical, sharp, strong, inflected, compressed at the point, edges of the mandibles bent inwards; nostrils basal, ovoid, open, situate near the ridge; tarsus same length as the middle toe; anterior toes united at the base; fourth quill longest.

Loxia leucoptera. White-winged Crossbill. Pl. 69. f. 38. Bill rather long, strong, greatly compressed, both mandibles equally convex, and crossing each other near the points, when closed; nostrils basal, round and lateral, concealed by reflected bristly feathers; toes divided their whole length; first wing-quill longest; tail bifurcated.

Psittirostra psittacea. Sandwich Island Parrot Bill. Bill short, greatly hooked and gibbous at the base; upper mandible bent over the lower one at the point; lower, broad, rounded, with an obtuse point; nostrils basal, lateral, half concealed by a feathered membrane; tarsus longer than the middle toe; toes divided their whole length, the lateral ones equal; first wing-quill obsolete, the second shorter than the third.

Pyrrhula vespertina. Evening Grosbeak. Pl. 69. f. 33. Bill short, thick, gibbous at the sides, compressed at the point and towards the ridge; both mandibles convex, particularly the upper one, the tip of which overhangs the lower one; nostrils basal, lateral, rounded, very frequently concealed by feathers in front; tarsus shorter than the middle toe; toes divided their whole length; wings short, fourth quill longest; tail slightly rounded or square.

Vidua superciliosa. Supercilious Whidaw Bunting. Pl. 69. f. 32. Bill straight conical, sharp at the point, inflected at the base, ridge of upper mandible raised; slightly bent at the tip; edges of under mandible somewhat inflected; nostrils basal, and partly concealed by feathers in front; tarsus shorter than the middle toe; third and fourth wing-quills longest; central tail quills or rectrices excessively elongated in the males; or the upper coverts are so.

Fringilla elegans. Elegant Linnet. Pl. 68. f. 21. Bill short, strong, straight, conical; upper mandible gibbous, depressed above, and a little bent at the point; nostrils basal, round placed near the forehead, partly concealed by the front feathers; tarsus shorter than the middle toe; toes entirely separated; wings short; third and fourth quills longest; tail varied.

Phytotoma Bloxami. Bloxam's Plant-Cutter. Pl. 69. f. 37. Bill rather short, slightly curved, with the ridge subdepressed, and rounded, base broad, the frontal feathers partly extending over the bill; margins of mandibles sulcated, the upper one widely and the under closely serrated, externally entire; tongue short entire; wings of medium length, first quill rather short, second longer, third, fourth, and fifth longest; feet strong, toes of moderate length, lateral ones equal; neck slender, long, and slightly curved.

Hyreus Abyssinius. Abyssinian Hyreus. Pl. 69. f. 35. Bill conical, thick, straight, somewhat serrated; nostrils ovate; feet with three toes; two before, and a hallux, which is strong, and provided with a hooked claw.

Colius Senegalensis. Senegal Coly. Pl. 69. f. 30. Bill short, thick, concav, a little compressed at the point; mandibles convex, the upper one covering the lower; nostrils basal, lateral, partially concealed by feathers; tail very long, conical; tarsus short; toes separated their whole length; hallux reversible; wings short; third quill longest.

ORDER V.—ZYGODACTYLI.

Bills of different forms, more or less curved, or greatly hooked, frequently straight and angular; feet always with two toes before and two behind, the exterior hind toe often reversible.

Family I. Bill more or less curved; feet with two toes before and generally two behind, the exterior hind toes in some instances reversible.

Musophaga variegata. Variegated Musophaga. Pl. 68. f. 26. Bill short, strong, broad, ridge elevated and arcuated; notched at the point; lower mandible with an angular extremity; nostrils basal, frequently concealed by feathers; less strong, tarsus equal in length to the middle toe; the exterior reversible; lateral toes equal; fourth and fifth wing-quills longest.

Indicator major. Great Honey Guide. Pl. 68. f. 23. Bill short, depressed, sides dilated, slightly bent and notched at the point; ridge distinct; nasal furrow large, nostrils basal, a little tubular; tarsus shorter than the external toe; toes united to the first joint; third wing-quill longest.

Cuculus cupreus. Cupreous Cuckow. Pl. 68. f. 28. Bill as long as the head, compressed and slightly curved; nostrils basal, placed in the margin of the mandible, invested by a naked, prominent membrane; legs feathered lower than the knee; toes united at their base; hind toes entirely divided; the exterior reversible; third quill longest; tail long, more or less graduated.

Coccyzus cæruleus. Blue Cuckoo. Pl. 68, f. 29. Bill rather long, strong, compressed its whole length; slightly arcuated from the base; under mandible straight, sloping at its point; nostrils basal, lateral, half closed by a naked membrane; tarsus slender, much longer than the middle toe; wings short, rounded, first five quills graduated.

Centropus Senegalensis. Senegal Coucal. Pl. 68, f. 30. Bill thick, compressed, deeper than broad, carinated, arcuated towards the point; nostrils basal, lateral, diagonally cleft; tarsus strong, longer than the exterior toe; two anterior toes joined at the base; inner hind toe, with a long subulate claw.

Phœnicophaus pyrrhocephalus. Malcoho. Pl. 68, f. 31. Bill longer than the head, strong, thick, rounded, smooth, arcuated, the base provided with divergent bristles; nostrils remote from the base, lateral and linear, orbits naked, covered with papillæ; tarsus longer than the external toe; wings short.

Leptosomus viridis. African Cuckoo. Pl. 68, f. 32. Bill nearly triangular, laterally compressed, with a prominent ridge, upper mandible a little arcuated, the lower one straight; nostrils in the middle of the bill, half closed by an elongation of the corneous matter; tarsus broad, depressed, covered with rough scales, wings long, fourth quill longest; tail long, equal.

Scythrops Novæ Hollandiæ. New Holland Scythrops. Pl. 68, f. 33. Bill long, convex above, laterally compressed, curved at the point; upper mandible longitudinally grooved; nostrils basal, naked, rounded; orbits naked; tarsus shorter than the middle toe; two external toes united at the base; tail long, rounded.

Saurothera vetula. Long-bellied Cuckoo. Pl. 68, f. 19. Bill longer than the head, slender, laterally compressed, convex above, edges of the upper mandible straight, slightly dentated; point abruptly hooked; nostrils oblong, covered by a membrane; tarsus short, smooth, and annulated; toes slightly attached at the base; hind ones quite free; wings of medium length; bastard wing very short; second and third quills longest; tail with ten feathers.

Pteroglossus maculatus. Spotted-billed Aragon. Pl. 69, f. 18. Bill longer than the head, slender, convex above, externally serrated, and curved at the point; nostrils placed at the bottom of the bill, concealed behind the corneous mass, vertical, orbicular, open; tarsus the length of the external toe; two anterior toes united to the second joint; wings short, concave; the first four quills equally graduated; tail long, graduated.

Ramphastos Aracari. Aracari Toucan. Pl. 69, f. 15. Bill extremely large, convex above, broader than the head at the base, somewhat incurved at the point, both mandibles serrated at the edges; nostrils placed close to the head, concealed behind the base of the bill; vertical, surrounded by a membrane; tarsus as long as the external toe; two anterior toes united to the second joint; tail short.

Crotophaga ani. American keel-bill. Pl. 69, f. 19. Bill short, thick, greatly compressed, carinated above; angulated at the edges; tarsus long, slender, a little longer than the external toe; wings short; tail rounded, consisting of eight broad feathers.

Trogon Pavonius. Quizel. Pl. 67, f. 21. Bill shorter than the head, thick, strong, arcuated above, broader than high, curved towards the point, margins dentated, base beset by long bristles; nostrils basal, open; legs short; tarsus not the length of the external toe; partially covered by feathers; exterior toe reversible; fifth wing-quill longest.

Capito cyanocollis. Blue-necked Barbet. Pl. 68, f. 24. Bill long, straight at the base, broader than deep, upper mandible longer than the under one, curved at the point; nostrils basal, lateral, pierced in the corneous substance, concealed by stiff hairs; tarsus as long as the exterior toe; two middle toes united to the second joint; wings short.

Bucco tamatia. Spotted-bellied Barbet. Pl. 68, f. 27. Bill strong, acute, laterally compressed, covered with strong bristles at the base; upper mandible, emarginate and incurved; nostrils basal, lateral; tarsus shorter than the external toe; anterior toes united to the second joint.

Pogonias erythromelas. Red-throated Pogonias. Pl. 68, f. 34. Bill short, strong, with a prominent arcuated ridge; edge of upper mandible furrowed or smooth, with one or two strong teeth; lower mandible less deep than the upper; nostrils basal, lateral, with strong bristles at the base; tarsus as long as the exterior toe; the two anterior toes united to the second joint.

Psittacus discurus. Racket-tailed Parrot. Pl. 68, f. 35. Bill short, thick, gibbous, very strong, both mandibles convex; greatly bent and hooked at the point; lower mandible short, obtuse; base of bill provided with a cere; head large; nostrils orbicular, open; pierced in the cere; legs short, very strong; tarsus shorter than the exterior toe; internal toes united at their base; tail much varied in different species.

Family II.—Bills straight and angular.

Picus Megillanicus. Megellanic Woodpecker. Pl. 68, f. 36. Bill long, or of medium length, straight, angular, cuneated at the tip; nostrils basal, open, covered by setaceous feathers; tongue round, vermiform; legs strong; two toes before and two behind, in some instances one only behind; anterior toes joined at their base, the posterior behind; tail with twelve feathers, the lateral ones very short.

Galbula macroura. Gold and Green Jacmar. Pl. 69, f. 17. Bill long, straight, or slightly bent towards the point, quadrangular and acute; nostrils basal, oval, partly covered by a naked membrane; tarsus shorter than the exterior toe; the fore toes united to the third joint.

Yunx torquilla. Wryneck. Pl. 67, f. 9. Bill short, straight, in the form of a depressed cone; ridge rounded, slender at the point; nostrils basal, naked, and partly closed by a membrane; two first toes united at their insertions; the hind ones divided; tongue long, vermiform, armed at the point with a horny substance; tail with ten soft flexible feathers.

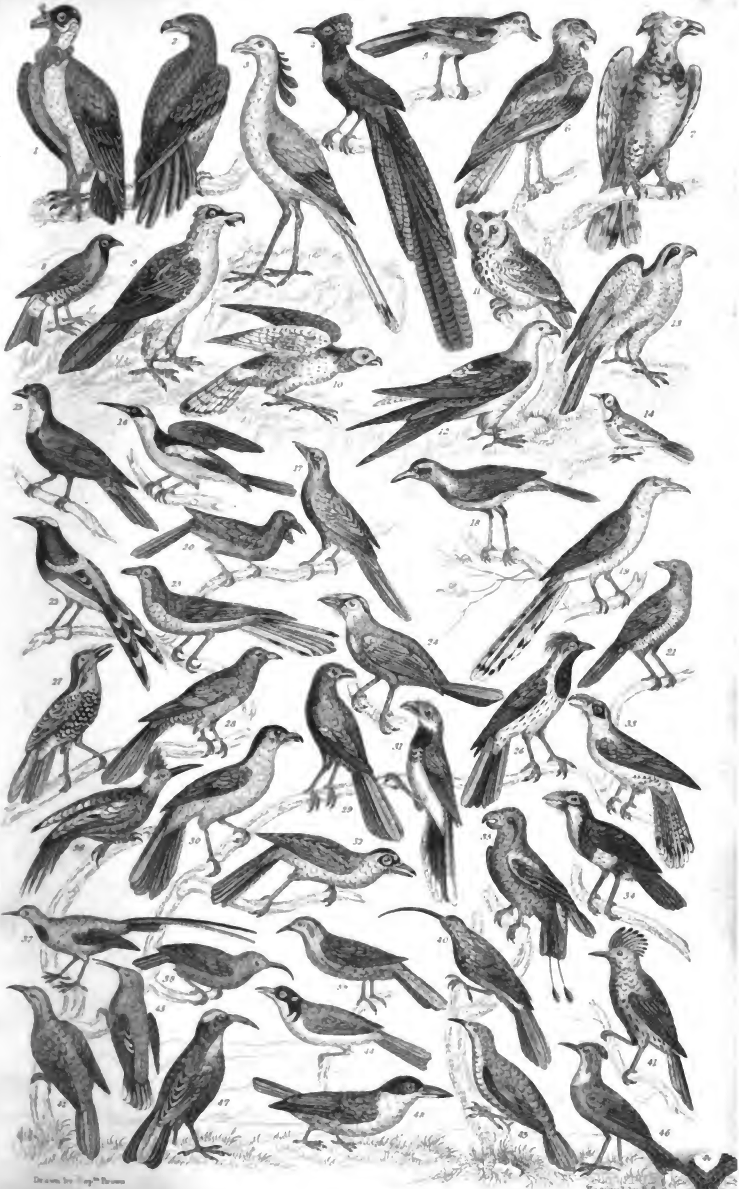
ORDER VI.—ANISODACTYLI.

Bill more or less arcuated, frequently straight; always subulate and slender; feet with three toes before and one behind, external one united at the base to the middle one; hallux generally long, all having long, bent claws.

Oxyrhynchus flammiceps. Bright-billed Oxyrhynchus. Pl. 68, f. 34. Bill short, straight, base triangular; point subu-

ORNITHOLOGY.

PLATE LXVIII



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Engraved by R. S

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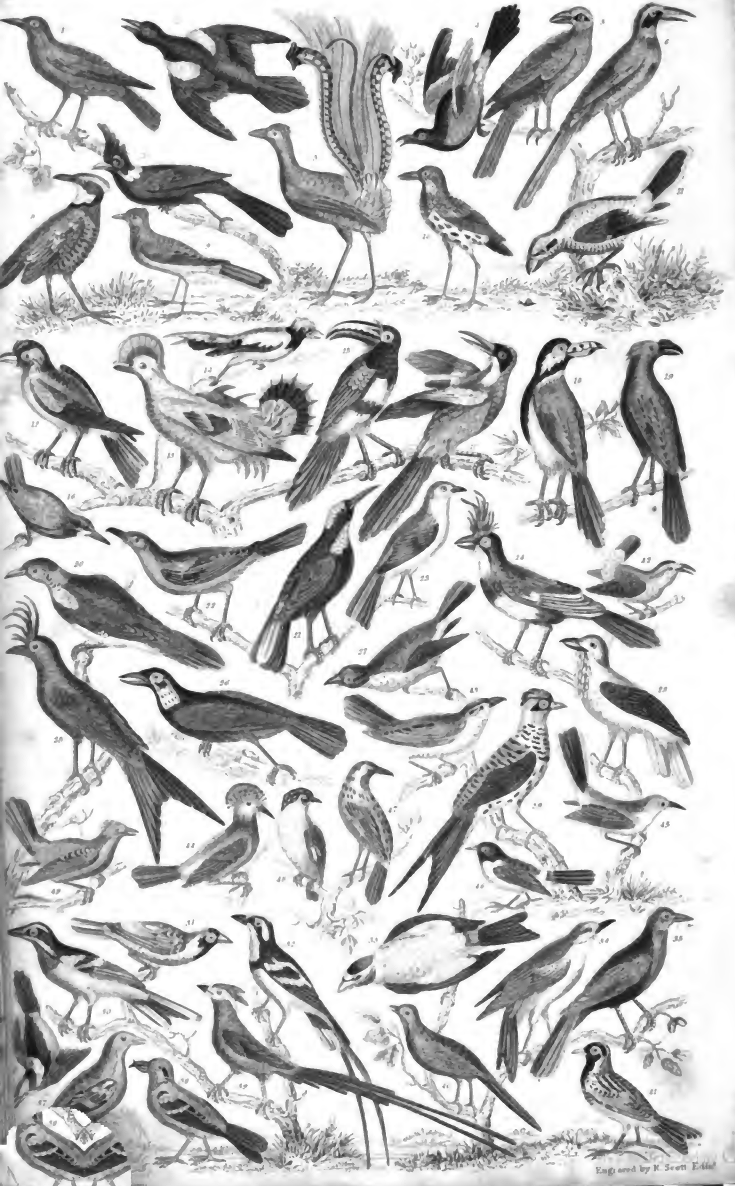
ORNITHOLOGY. PLATE 70



Engraved by R. Scott Edin^r

late; nostrils basal, lateral, naked; partly covered by a membrane; tarsus short, nearly as long as the middle toe; three toes before, the lateral ones equal, external united at the base, internal separate; fourth and fifth quills longest.

Sitta pusilla. Slender Nuthatch. Pl. 67, f. 17. Bill straight, cylindrical, slightly compressed, point acuminate; nostrils basal, partly concealed by reflected bristles; tongue short, horny; three toes before, exterior joined at its base to the middle one; hallux very long, with a long hooked claw; tail with twelve feathers.

Orthonyx maculatus. Spotted Orthonyx. Pl. 69, f. 40. Bill very short, compressed, nearly straight, notched at the point: nostrils central, open, surmounted by bristles; tarsus longer than the middle toe; claws longer than the toes, laterally furrowed; wings very short; tail long, pointed.

Dendrocolaptes falcirostris. Hookbilled Dendrocolaptes. Pl. 68, f. 40. Bill depressed; base trigonal; straight, or bent; nostrils basal, lateral; tongue short, cartilaginous; exterior toe united to the middle one at the second joint, internal very short, claws hooked and furrowed.

Xenops genibarbis. The Xenops. Pl. 69, f. 39. Bill short, slender, subulate, acute, greatly compressed; nostrils basal, lateral, covered by a naked membrane; lateral toes equal, external one united to the second joint; claws strong, compressed, bent; tail cuneiform.

Anabates leucophrus. White-browed Anabates. Pl. 68, f. 42. Bill straight, shorter than the head, or the same length in some species; compressed, deeper at the base than broad, a little bent at the point, entire; nostrils basal, lateral, oval, partly covered by a feathered membrane; tarsus longer than the middle toe, the exterior toe united to the second joint, and the interior at the base; wings short; shafts of tail feathers weak.

Opetiorhynchus rufus. Reddish Opetiorhynchus. Pl. 68, f. 18. Bill longer than the head, slender, subulate, base depressed, point compressed; tongue short, cartilaginous; nostrils lateral, placed near the base, half closed by a naked membrane; tarsus double the length of the middle toe; lateral toes equal, the exterior united at the base; wings short, first three quills graduated, the third and fourth longest; tail short, slightly graduated.

Certhia maculata. Black and White Creeper. Pl. 67, f. 18. Bill long or of medium length, more or less curved, triangular, compressed, slender; nostrils basal, naked, horizontal, half closed by a membrane; three toes before, the exterior united at its base to the intermediate one; claws greatly hooked, that on the hallux longest; tail graduated, with stiff pointed shafts; fourth wing-quilll longest.

Cœreba cyanea. Azure Creeper. Pl. 68, f. 16. Bill slightly arcuated, thick at the base; edges of mandibles inflected, point sharp; upper mandible slightly notched; tongue long, not extensible, bifid, filamentous; tarsus longer than the middle toe; lateral toes equal, tail of medium length.

Trochilus eurynomus. Scaly-barked Humming Bird. Pl. 67, f. 33. Bill generally long, straight, or arcuated, tubular, very slender, base depressed, acuminate; upper mandible nearly concealing the lower one; tongue long, extensible, bifid, tubular; nostrils open in front, covered by a broad membrane; legs very short; tarsus shorter than the middle toe; three anterior toes nearly divided; wings graduated, first quill longest.

Nectarinia melanogaster. Black-breasted Soul-Manga. Pl. 68, f. 37. Bill long, slender, subulate, more or less arcuated, effuse and depressed at the base; mandibles equal, edges of the under reflected, partly concealed by the upper one; tongue long, extensible, tubular, bifid; nostrils situate near the base, lateral, closed above by a naked membrane; tarsus as long, or longer than the middle toe, lateral toes united at their base; wings without the first quill, or with a very short one; third and fourth longest.

Climacteris scandens. Climbing Climacteris. Pl. 68, f. 45. Bill short, subulate, greatly compressed; mandibles equal, acuminate; nostrils covered by a naked membrane; tarsus length of the middle toe, which with the hallux, is very long; claws long, hooked, furrowed at the sides; exterior toe united to the second joint, the anterior to the first joint; third and fourth quills longest.

Tichodroma phœnicoptera. Wall Creeper. Pl. 68, f. 43. Bill very long, cylindrical, slender, slightly arcuated, angulated at the base, depressed at the point; nostrils basal, naked, half closed by an arched membrane; exterior toe joined to the middle one at the base; claw on the hallux very long; tail rounded, feathers with weak shafts.

Upupa epops. Hoopoe. Pl. 67. f. 31. Bill very long, slightly arcuated, slender, triangular, compressed; nostrils basal, lateral, ovoid, open, and surmounted with feathers in front; exterior toe united to the middle one of the first joint; tail square, consisting of ten feathers.

Epimachus Brisbanii. Brisbane's Epimachus. Pl. 68, f. 47. Bill considerably shorter than the head, slender, more or less arcuated, compressed; mandibles acuminate, the upper one slightly notched at the point, and longer than the lower one; gape wide extending to under the eyes; tongue short, cartilaginous; nostrils basal, lateral, open before, half closed by a feathered membrane; legs short; tarsus longer than the middle toe; external toe united to the first joint; fourth and fifth quills longest.

Drepanis vestiaria. Scarlet Drepanis. Pl. 68, f. 38. Bill very long, rounded above, thick and triangular at the base, subulate at the point; upper mandible longer than the under; tongue short, cartilaginous; nostrils half closed above; tarsus double the length of the middle toe; lateral toes equal; third, fourth, and fifth quills longest.

Meliphaga lunulata. Crescent Naped Honey Eater. Pl. 68, f. 44. Bill length of the head, in some species shorter, compressed, somewhat arcuated; emarginate and acute towards the point; nostrils lateral, ovoid, covered by an arched membrane; tongue long, extensible, terminated by cartilaginous filaments; external toes united to the second joint, the internal to the first; hallux long, very strong.

ORDER VII.—ALCYONES.

Bill long, or of medium size; pointed and nearly quadrangular, either slightly arcuated or straight; tarsus very short; three toes united before and one behind.

Merops Bullockii. Bullock's Bee Eater. Pl. 67, f. 32. Bill pointed with acute edges, slightly arcuated; nostrils basal, lateral, ovoid, concealed by protruding hairs; tarsus short; toes united, the exterior to the second joint, and the interior to the first joint of the middle toe; hallux broad at its base; second quill longest.

Alcedo Macleayii. Macleay's Kingfisher. Pl. 68, f. 48. Bill long, straight, quadrangular, acuminate, sharp-edged, and very rarely depressed; nostrils basal, lateral, oblique, nearly closed by a naked membrane: legs short, naked above the knee; exterior toe united to the second joint, interior to the first joint of the middle toe.

Dacelo gigantea. Gigantic Dacelo. Pl. 67, f. 34. Bill thick, strong, quadrangular, conical; mouth gaping to the eyes; upper mandible longest, broadly notched near its point, on each side; nostrils oblong, half closed by a feathered membrane, tarsus shorter than the middle toe; external toe united to the third joint, the internal to the second; wings of medium size.

ORDER VIII.—CHELIDONES.

Bill very short, greatly depressed, and very wide at the base; upper mandible curved at the point; legs short; three toes before, either entirely divided or connected at the base by a short membrane; hallux reversible; claws much hooked; wings long.

Hirundo albicollis. White-necked Swallow. Pl. 70, f. 2. Bill short, triangular, base divaricate, depressed, mouth gaping nearly to the upper mandible, slightly hooked at the point; nostrils basal, oblong, partly closed by a membrane, surmounted by feathers in front; legs short, toes and claws slender, exterior toe united to the first joint of the middle one; wings long, first quill longest; tail generally furcated, and consisting of twelve feathers.

Cypselus melbus. White Bellied Swift. Pl. 70, f. 4. Bill very short, triangular, divaricated, and depressed at the base; gape as far as under the eyes; upper mandible hooked at the point; nostrils placed at the upper part of the bill; longitudinally cleft, open, margins raised, feathered; legs very short, with the four toes directed forwards, entirely divided; toes and claws short, thick; wings very long; tail with ten feathers.

Caprimulgus leopetes. Berbice Goatsucker. Pl. 70, f. 9. Bill very small, slightly curved, depressed at the base, mouth extremely wide; nostrils basal, wide, closed by a membrane, surmounted by feathers; legs short; anterior toes united to the first joint; middle claw long, serrated on the edge, but smooth in some of the foreign species; hallux reversible; tail round or forked, consisting of ten feathers.

Podargus humeralis. Cold-River Night Jar. Pl. 70, f. 7. Bill broader than the head, abruptly acuminate, and deflexed at the tip; upper mandible spatuliform, arcuated; surrounded by stiff bristles; basal, nostrils linear, hidden by a bristled membrane; wings shorter than the tail; toes entirely divided; claws nearly equal.

ORDER IX.—COLUMBÆ.

Columba aromatica. Aromatic Pigeon. Pl. 67, f. 30. Bill of medium size, strait at the base, tip, or horny point, compressed and deflected; base of upper mandible covered by a soft skin, in which the nostrils are situate, towards the middle of the bill; point more or less curved; feet with three entirely separated toes in front, and one behind; claws short, blunt, strong; wings of medium length, acuminate; first quill rather shorter than the second, which is the longest.

Lophyrus coronatus. Crowned Pigeon. Pl. 67, f. 24. Bill straight, rather compressed, swelling a little at the point; upper mandible with a furrow, bent at the tip; lower mandible grooved, short, swelling at the point, and somewhat reflected; nostrils small, orbicular, situate in a groove; tarsus long, strong, covered with round scales; anterior toes united at the base by a small membrane; tail with twelve feathers.

ORDER X.—GALLINÆ.

Bill short, convex in some genera, covered by a cere; upper mandible arcuated from its base, in some species, bent only at at the point; nostrils lateral, covered by a membrane, naked or surmounted by feathers; tarsus long; three anterior toes, united at their base by a membrane; hallux articulated on the tarsus above the junction of the anterior toes.

Pavo muticus. Japan Peacock. Pl. 70, f. 5. Bill convex above, thick, bent towards the point, naked at the base; nostrils placed near the ridge, a little from the base, open; cheeks partially naked; tarsus longer than the middle toe, with a conoid spur; head crested; tail consisting of eighteen feathers, elongated, broad, capable of being expanded, like a fan.

Euplocomus ignitus. Macartney's Cock. Pl. 70, f. 3. Bill long, slightly arcuated from its base, where it is somewhat divaricate; nostrils placed towards the centre, and near the ridge, skin of the nostrils stretching backwards, covering the sides of the head; tarsus longer than the middle toe, nails short, strong; tail generally bifurcated and large, with the feathers broad and pointed.

Gallus furcatus. Fork-tailed Cock. Pl. 70, f. 22. Bill of medium size, strong, and naked at the base, upper mandible arcuated, convex, bent towards the point; head surmounted by a fleshy crest; ears naked; three anterior toes united to the first joint; hallux raised from the ground; tarsus provided with a long and bent spur; middle feathers of the tail arcuated; wings short.

Phasianus versicolor. Diard's Pheasant. Pl. 70, f. 10. Bill short, thickened, naked at the base, bent towards the point; nostrils basal, lateral; cheeks naked, warty; ears covered; anterior toes united to the first joint; tarsus with spurs in the males, tail elongated, cuneiform, composed of eighteen feathers; wings short.

Lophophorus impeyanus. Impeyan Lophophorus. Pl. 70, f. 6. Bill long, thick, greatly arcuated, broad at the base; upper mandible arched; very long, extending considerably beyond the under one, edged at the point; ridge elevated; nostrils basal, lateral, half closed by a thinly feathered membrane; tarsus covered with feathers above, and provided with a long, sharp spur; anterior toes united by a membrane; hallux elevated; tail short, rounded; head with a crest.

Tragopan satyrus. Nepaul Tragopan. Pl. 70, f. 24. Bill of medium size, slightly arcuated from its base; nostrils a little way from the base of the bill, and nearly central; from the base of the lower mandible is suspended a loose pendent skin, susceptible of inflation; face naked; behind each eye a slender horn-like process; tarsus in both species armed with a spur; tail rather short.

Polyplectron emphanum. Crested Polyplectron. Pl. 70, f. 13. Bill of medium size, straight, slender, compressed; upper mandible bent towards the point; nostrils placed in the middle of the bill, lateral, half closed by a naked membrane; orbits and cheeks naked; tarsus long, slender, and in the males furnished with two or more spurs; anterior toes united by a membrane; hallux elevated; tail, long, rounded.

Meleagris ocellata. Honduras Turkey. Pl. 70, f. 15. Bill short, thick, base covered with a naked skin; head and upper part of the neck furnished with a naked tuberculated skin; a loose, pendent caruncle on the upper part of the bill; throat provided with a longitudinal, pendulous, carunculated wattle; tarsus of the male with a spur; wings short, consisting of eighteen feathers, spreading into a circle.

Argus giganteus. Argus Pheasant. Pl. 70, f. 8. Bill as long as the head, straight, compressed; base naked; upper mandible arcuated, bent towards the point; nostrils lateral, situate in the middle of the bill, half closed by a membrane; head, cheeks, and neck, naked; tarsus slender, smooth; anterior toes united by a membrane; hallux joined on the tarsus; tail ascending, compressed, consisting of twelve feathers, two central ones greatly elongated.

Numida cristatus. Crested Pintado. Pl. 70, f. 11. Bill short, thick, arcuated, base covered by a warted membrane; a carunculated wattle suspended from the under mandible; nostrils placed in the cere, divided by a cartilage; head naked or feathered, crown provided with a callous horn or crest; tarsus smooth; anterior toes united by a membrane; hallux attached to the tarsus; tail short, bent down.

Pauxi galeata. Galeated Curassow. Pl. 70, f. 1. Bill short, strong, arcuated, convex, compressed; base of the upper mandible corneous, dilated; nostrils basal, lateral, open below; tarsus long, smooth; anterior toes united by a membrane; hallux articulated to the tarsus, partially touching the ground; wings short.

Crax alector. Crested Curassow. Pl. 70, f. 12. Bill long, thick, sides compressed, point incurved, base covered by a cere; nostrils lateral, situate in the cere, half covered, open in front; crown ornamented with revoluted plumes; three anterior toes united at their base; tail broad, pendent.

Penelope marail. Marail. Pl. 70, f. 14. Bill medium sized, broader than deep, point compressed and bent; nostrils lateral, ovate, half covered by a membrane, open in front; cheeks naked; throat with a longitudinal wattle, the centre carunculated; tarsus reticulated; anterior toes united by a membrane; hallux articulated on the same level; wings short.

Tetrao Canadensis. Spotted Grouse. Pl. 70, f. 18. Bill short, thick, arcuated above, convex, bending towards the point, base naked; nostrils basal, half closed by an arched scale above, and concealed by small feathers; eyebrows naked, with scarlet warts; tarsus feathered; toes united to the first joint; hallux margined with asperities.

Lagopus Saliciti. Willow Ptarmagan. Pl. 70, f. 17. Bill very short, base invested by feathers; upper mandible convex, and bent towards the point; nostrils basal, lateral, partly closed by an arcuated membrane, and almost concealed by close-set feathers at the base of the bill; eyebrows naked; furnished with a fleshy comb; wings short, concave, third and fourth quills longest; tail generally square at the extremity; tarsus and toes completely feathered, hallux very short, and hardly touching the ground with the point of the nail; nails long, and nearly straight.

Pterocles arenarius. Banded Sandgrouse. Pl. 70, f. 19. Bill of medium length, compressed, and slender, in some species; upper mandible straight, bent slightly towards the point; nostrils basal, half closed by a membrane; toes short, united to the first joint; hallux very small, articulated high on the tarsus; fore part of tarsus feathered, back part naked; tail conical, in some species the two central feathers are elongated and filiform; wings long, acuminate, first quill longest.

Syrrhaptes Pallasii. Pallas's Sandgrouse. Pl. 70, f. 27. Bill short, conical, slender; upper mandible slightly bent, with a groove along the ridge; nostrils basal, lateral, covered by feathers in front; feet with three toes only, directed forwards, and united their whole length; tarsus and toes covered with woolly feathers; tail conical, two central feathers elongated, and filiform; as also the first and second quills.

Ortyx neoxenus. Welcome Quail. Pl. 70, f. 16. Bill very short, thick, highly arched; nostrils basal, half closed by an arcuated membrane; tarsus longer than the middle toe; toes united by a membrane to the first joint; tail long, cuneiform and rounded at its extremity.

Perdix picta. Painted Partridge. Pl. 70, f. 23. Bill short, compressed, strong, base naked; upper mandible arcuated, convex, much curved at the point; nostrils basal, lateral, half closed by an arcuated, naked membrane; toes united by a membrane to the first joint; tail with fourteen or eighteen feathers, short, rounded, and slanting downwards; wings short.

Cryptonyx coronatus. Crowned Cryptonyx. Pl. 70, f. 26. Bill short, thick, compressed, mandibles of equal length, upper one straight, a little bent at the point; nostrils lateral, longitudinally cleft, placed near the middle of the bill, covered above by a broad, naked membrane; tarsus long; toes united at their base by a membrane; hallux not touching the ground, destitute of a claw; wings short.

Tinamus sylvicolus. Barred Tinamoo. Pl. 70, f. 31. Bill straight, slender, depressed; broader than deep, point rounded, ridge distinct, forming a large nasal furrow, in which the nostrils are placed laterally; tarsus long, often with asperities behind; toes short, entirely divided; hallux very short; tail very short, or none; wings short.

T. rufescens. Guaza. Pl. 70, f. 32.

Hemipodius tachydromus. Andalusian Turnix. Pl. 70, f. 29. Bill straight, slender, much compressed, with an elevated ridge, and curved towards the point; nostrils lateral, linear, partly closed by a naked membrane; tarsus long; three anterior toes, but destitute of a hallux; tail feathers slender, concealed by the upper coverts; first quill longest.

ORDER XI.—ALECTORIDES.

Bill shorter than the head, or of the same length; strong; upper mandible convex, frequently hooked at the point; tarsus long, slender, three toes before, and one behind; hallux articulated higher on the tarsus than the toes.

Psophia crepitans. Golden-breasted Trumpeter. Pl. 70, f. 30. Bill short, conical, curved, greatly bent at the point; upper mandible longer than the under; nasal furrow wide, extended; nostrils situate near the centre of the bill, wide, diagonal, closed behind by a naked membrane; legs long, slender, middle and exterior toe united, the interior separated; hallux articulated interiorly, and on a level with the toes; wings short, concave; tail very short.

Dicholophus cristatus. Crested Dicholophus. Pl. 67, f. 27. Bill longer than the head, thick, arcuated; gape wide, extending to the eyes, depressed at the base, compressed, and slightly hooked at the point; nasal furrow large; nostrils small, covered by a membrane; legs long, slender; toes very short and thick, united at the base by a membrane; hallux articulated to the tarsus, and not touching the ground; claws short, strong; wings destitute of spines.

Glareola isabella. White-throated Glareola. Pl. 70, f. 33. Bill short, convex, tip compressed; upper mandible curved half its length; nostrils basal, lateral, obliquely cleft; legs feathered to the knee; tarsus long, slender, exterior toe united to the middle one by a short membrane, the inner toe quite separate; hallux articulated on the tarsus; claws long, subulate; wings very long.

Palamedea cornuta. Horned Screamer. Pl. 70, f. 35. Bill short, conically convex, greatly curved at the point, compressed its whole length; nasal furrow large; head small, covered with down, armed with a slender and flexible horn; nostrils remote from the base of the bill, lateral, oval, open; legs short, thick; toes very long, lateral one connected with the centre toe by a short membrane; wings ample, and spurious, wings provided with spurs.

Chauna chavaria. Faithful Jacana. Pl. 70, f. 28. Bill shorter than the head, conico-convex, slightly arcuated, curved at the tip; base provided with small feathers; lores naked; nostrils oblong; legs long, slender; toes long, united by a membrane; wings furnished with two spurs.

ORDER XII.—CURSORES.

Bill of medium size; legs long, naked above the knee; feet with only two or three toes, directed forwards.

Struthio camilus. Ostrich. Pl. 67, f. 38. Bill straight, obtuse, depressed, angulated and rounded at the point; mandibles equal and flexible; nostrils near the middle of the bill; legs very long, strong, muscular, with only two toes directed forwards, the inner one much the shortest, and provided with a large blunt claw; tibia very fleshy to the knee; wings short, unfit for flight, composed of long, soft, flexible feathers, and armed with a double spur.

Rhea Americana. American Ostrich. Pl. 70, f. 25. Bill straight, short, soft, base depressed, tip slightly compressed, and obtuse; lower mandible greatly depressed, flexible, and rounded at the tip; nostrils large, longitudinally cleft, open, placed on the lateral surface of the bill; legs long; feet with three anterior toes, and a callosity behind; wings short, feathers more or less long, a spur on the tip of the spurious wing.

Dromiceus Novæ Hollandiæ. Emu. Pl. 67, f. 37. Bill

straight, edges greatly depressed, tip rounded; head feathered; throat naked; feet with three anterior toes; wings very short.

Casuarius galeatus. Galeated Casuary. Pl. 70, f. 23. Bill straight, short, compressed, rounded towards the point, with a keeled ridge, and the base provided with a bony, rounded protuberance; under mandible soft, flexible, and angular near the extremity; nostrils round, placed in the lateral part of the point of the bill; legs muscular, feet with three anterior toes, inner short, armed with a long and strong claw; tibia almost entirely covered with feathers; wings short, not adapted for flight.

Otis tetrax. Little Bustard. Pl. 70, f. 34. Bill straight, conical, compressed; tip of upper mandible slightly arched; nostrils remote from the base, open, oval, and approximate; legs long, naked above the knee, three short anterior toes, united at their base, and bordered by a membrane; wings of medium length, third quill longest.

Cursorius Asiaticus. Coromandel Courier. Pl. 70, f. 21. Bill shorter than the head, depressed at the base, curved and acuminate towards the point; nostrils oval, surrounded by a small protuberance; legs long, slender; feet with three anterior short toes, entirely divided, interior one shortest; claws very small; second wing-quills longest.

ORDER XIII.—GRALLATORES.

Bill variously shaped, generally straight, in the form of an elongated cone, compressed, rarely depressed, legs slender, long, more or less naked above the knee; three anterior, and one posterior toe or hallux, which is united on a level with the front toes, or more elevated.

FAMILY I.—WITH THREE TOES ONLY.

Œdicnemus crepitans. Thick Knee. Pl. 71, f. 5. Bill longer than the head straight, strong, tip compressed, ridge carinated; under mandible forming an angle with the upper; nostrils placed in the middle of the bill, cleft longitudinally, open in front; legs long, slender; three anterior toes united to the second joint by a membrane, which extends along the toes; tail cuneiform.

Calidris arenaria. Sanderling. Pl. 71, f. 3. Bill of medium size, slender, straight, soft, flexible, compressed from the base, and depressed towards the tip, flattened and obtuse; nostrils lateral, longitudinally cleft; legs slender; anterior toes almost entirely divided; wings middle-sized, first quill longest.

Falcinellus pygmæus. Pigmy Curlew Pl. 71, f. 9. Bill arcuated, soft, compressed its whole length, depressed at the point; nasal furrow elongated; nostrils basal, linear, lateral; tarsus longer than the middle toe; feet with three anterior toes only.

Himantopus nigricollis. Black-necked Longshank. Pl. 71, f. 2 Bill long, slender, cylindrical, base depressed, point compressed; half of mandibles channelled; nostrils lateral, linear, long; legs very long and slender; three anterior toes, middle one united to the exterior by a broad membrane, and to the interior by a rudimentary one; claws very small, flat; wings very long, first quill considerably the longest.

Hæmatopus ater. Black Oyster-catcher. Pl. 71, f. 4. Bill long, strong, compressed, point much flattened and cuneated; nostrils lateral, longitudinally cleft in the channel of the bill; legs strong, muscular; three anterior toes, the middle one united to the first joint, interior one margined by a rudimentary membrane; wings medium-sized, first quill longest.

Charadrius vociferus Kildeer Plover. Pl. 72, f. 7. Bill shorter than the head, slender, straight, compressed; mandibles gibbous towards the point; nostrils longitudinal, placed in the membrane which covers the nasal furrow; legs slender; three anterior toes, exterior connected to the middle one by a short membrane, the interior divided; tail slightly rounded or even; wings medium size, second quill longest.

FAMILY II.—WITH FOUR TOES.

Vanellus albicapillus. White-crowned Lapwing. Pl. 71, f. 1. Bill short, straight, slender, compressed, point gibbous; nostrils lateral, longitudinally cleft; legs slender, three anterior toes, and one behind, exterior connected to the middle one by a short membrane, hallux almost obsolete, or very short; not touching the ground; wings elongated.

Stripsilas collaris. Turnstone. Pl. 72, f. 5. Bill medium-sized, strong, straight, slightly inclined upwards, ridge depressed, point truncated; nostrils basal, lateral, half closed by a membrane; a short naked space above the knee; anterior toes connected at the base by a very short membrane; hallux articulated to the tarsus; wings acuminate.

Grus torquata. Collared Crane. Pl. 72, f. 6. Bill as long, or longer than the head, strong, straight, compressed, point obtuse; lateral base of mandible deeply sulcated, ridge elevated; nostrils central, closed behind by a membrane; region of the eyes and base of the bill naked and papillous, or covered with feathers; legs long, with a large naked space above the knees; the middle toe united to the exterior one by a rudimentary membrane; the interior toe divided: hallux articulated higher on the tarsus.

Anthropoides virgo. Numidian Crane. Pl. 72, f. 1. Bill the length of the head, compressed, entire, thick, convex, and furrowed near the point; nostrils concave, ovoid, open, situate in the ridge of the bill, covered behind by a membrane; tarsus long, smooth, and slightly reticulated, three anterior toes united at the base by a membrane, interior one free; wings long, first, second, and third quills longest, second prolonged beyond the first.

Aramus scolopaceus. Scolopaceous Heron. Pl. 72, f. 4. Bill somewhat longer than the head, straight, hard, and bending slightly at the point; lower mandible a little tumid before, and concave behind, angular, and pointed. nostrils lateral, remote from the base of the bill; legs long, strong; anterior toes quite divided; hallux long, resting on the ground; nails long, bent; wings medium-sized, third quill longest.

Ardea purpurea. Purple Heron Pl. 71, f. 6. Bill as long, or longer than the head, strong, straight, compressed, accuminate; upper mandible slightly sulcated; ridge rounded, nostrils basal, lateral, longitudinally cleft in a groove, half closed by a membrane; orbits and lores naked; legs long, slender, with a bare space above the knee; exterior toe united to the middle one by a short membrane; claws long, compressed, that of the middle toe interiorly dentated.

Ardea garzetta. Egret. Pl. 72, f. 3.

Botaurus exilis. Least Bittern. Pl. 72, f. 8. Bill same length, or longer, than the head, strong, higher than broad; mandibles of equal length, upper somewhat deeper than the under one, sulcated two-thirds its length, gently curving from the base to the point; ridge broad, flat at the base, but becoming narrow and rounded from before the nostrils to the tip; under mandible strong, tapering to the point; edges inflected, very sharp, and finely serrated near the tip; nostrils basal, linear, longitudinal, placed in a furrow, partly covered by a naked membrane; legs of medium length; toes long, slender, unequal; wings long, rounded; three first quills longest.

Nycticorax violacea. White-crowned Night-heron. Pl. 72, f. 10. Bill very strong, rather longer than the head, compressed, upper mandible arcuated, and slightly bulging towards the base, sulcated three-fourths its length, emarginated; ridge rounded. nostrils basal, longitudinal, placed in the furrow, covered by a naked membrane; lores and orbit naked; legs of medium length, slender, exterior toe united to the middle one by a membrane, as far as the first joint, claws short, falcated, that of the middle toe pectinated; tibia naked for a short space above the knee; first quill shorter than the second, third longest.

Ciconia alba. White Stork. Pl. 71, f. 7. Bill long, straight, strong, acutely conical; ridge rounded, of equal height with the head, under mandible slightly bent upwards; nostrils nearly basal, longitudinal, placed in the groove; region of the eyes naked; legs long; three anterior toes united to the first joint, hallux articulated on the same level; wings of medium size.

Argala gigantea. Gigantic Adjutant. Pl. 72, f. 12. Bill greatly longer than the head, form of an elongated cone, slightly curved from the base, which is as thick as the head, tapering to an obtuse point; ridge but little elevated; nostrils ovate, situate near the base of the bill; head and neck divested of feathers: neck with a long, naked, fleshy appendage; legs long; tibia wholly naked; feet with three anterior toes united by a scolloped membrane; hallux rather long, resting on the ground; wings of medium length, first quill longest.

Mycteria Senegalensis. Senegal Jabiru. Pl. 72, f. 2. Bill very long, thick, smooth, laterally compressed, acute; both mandibles inclining upwards; upper mandible trigonal, lower mandible more thickened; nostrils longitudinal, narrow, remote from the base of the bill; legs long, strong; three quarters of the tibia naked, three anterior toes slightly united at their base by a membrane; hallux articulated high on the tarsus, with its point resting on the ground; wings long, third, fourth, and fifth quill longest.

Anastomus Coromandelinus. Coromandel Anastomus. Pl. 72, f. 14. Bill thick, greatly compressed, gaping towards the middle; upper mandible denticulate on the margins, furrowed at the base, nostrils linear; legs long, slender; three anterior toes united by a short membrane; hallux articulated on the same level as the toes.

Scopus Umbretta. Tufted Umbre. Pl. 72. f. 20. Bill compressed, soft, inclining at its point; upper mandible surmounted its whole length by a projecting ridge, and grooved; nostrils oblique; tarsus longer than the middle toe; exterior toe united to the middle one, length of first joint; hallux resting on the ground.

Phœnicopterus ruber. Red Flamingo. Pl. 71, f. 8. Bill thick, strong, deeper than broad; upper mandible nearly straight for about half its length, where it is slightly arcuated, and from whence it suddenly bends downwards to within two-thirds its length, where it is abruptly hooked, and terminates with a lanceolate point; the under edge corresponds somewhat in form with the upper side, where it is sharp and cutting; ridge notched; under mandible envelops the upper; nostrils oblong, ovate, longitudinal, placed near the base of the bill; legs very long, the anterior toes webbed to their points; hallux small, articulated high on the tarsus; wings of medium size, second quill longest.

Recurvirostra Americana. American Avoset. Pl. 71, f. 10. Bill very long, slender, weak, depressed its whole length, flexible, undulated, turned up at the point; upper mandible longitudinally channelled on its surface, under one laterally; nostrils linear, long; legs long, slender; anterior toes united by a membrane as far as the second joint; hallux very short, articulated high on the tarsus; wings acuminate, first quill longest.

Cancroma cochlearia. Crested Boat-bill. Pl. 72, f. 11. Bill longer than the head, greatly depressed; broader than deep, dilated towards the middle; ridge prominent, grooved on each side, in which the oblique nostrils are situate; upper mandible in the form of a boat reversed, the lower one acuminate; anterior toes united at their base; hallux on a level with the toes.

Platalea agaga. Roseate Spoonbill. Pl. 71, f. 11. Bill very long, greatly depressed, much dilated, and spatuliform towards the point; upper mandible channelled, and transversely sulcated at the base; nostrils approximated, oblong, open, bordered by a membrane; face and head wholly or partially naked; legs long; anterior toes united the length of the second joint by deeply indented membranes; hallux long, resting on the ground.

Tantalus loculator. Wood Ibis. Pl. 71, f. 12. Bill very long, nearly straight, laterally compressed, destitute of a nasal furrow, base as thick as the head, short, and curved at the tip; upper mandible arcuated; sides dilated, tip compressed, cylindrical, and slightly notched; under mandible equal with the upper one, inflected at the base, and slightly bent towards the tip; both mandibles greatly inflected, and sharp; face destitute of feathers; nostrils longitudinal, oblong, cleft in the horny substance; tarsus double the length of the middle toe; toes united by a broad scalloped margin; hallux long, resting on the ground; wings long, first and second quills longest.

Ibis ruber. Scarlet Ibis. Pl. 71, f. 21. Bill long, slender, arcuated, broad at the base, tip depressed, obtuse, rounded; upper mandible deeply furrowed; nostrils almost basal, situate near the upper part of the bill, oblong, straight, placed in the membrane which covers the furrow; face, and in some species, part of the head and neck naked; legs naked above the knee; toes united as far as the first joint, hallux long, the point reaching the ground.

Numenius phæopus. Wimbril. Pl. 71, f. 13. Bill strong, arcuated, compressed, point hard, and slightly obtuse; upper mandible projecting beyond the lower, rounded at the point, and channelled three-fourths of its length; nostrils lateral, linear, pierced in the furrow; face feathered; legs slender, naked above the knee, toes united by a membrane to the first joint; hallux articulated to the tarsus, and touching the ground.

Tringa alpina. Dunlin. Pl. 71, f. 14. Bill medium-sized, long in some species, slightly arcuated, curved, or straight at the point, soft, flexible, base compressed; point depressed, dilated, obtuse; both mandibles channelled near their extremities; nostrils lateral, conical, placed in the membrane which covers the furrow; legs slender, naked above the knee; toes entirely divided; in a few species the exterior and middle toes are connected by a membrane; hallux articulated to the tarsus.

Totanus semipalmatus. Semipalmated Sandpiper. Pl. 71, f. 15. Bill medium length, straight, compressed, but rarely recurved, base soft, tip hard, sharp, and acuminate; mandibles furrowed at the base, upper one bent down at its extremity on the under; nostrils linear, longitudinally cleft in the furrow; legs long, slender, naked above the knee; middle toe united to the outer by a membrane, which in some species extends to the second joint.

Limosa fedoa. Marbled Godwit. Pl. 72, f. 17. Bill very long, more or less recurved, soft, flexible, depressed towards the point; both mandibles longitudinally channelled; point dilated, obtuse; nostrils lateral, longitudinally cleft in the groove; legs long, slender; a large naked space above the knee; exterior toe united to the middle one by a membrane to the first joint; hallux articulated on the tarsus.

Scolopax Wilsonii. Wilson's Snipe. Pl. 71, f. 19. Bill long, straight, compressed, slender, soft, tip tumid, and hooked; both mandibles channelled half their length, the point of the upper one projecting beyond that of the under; nostrils basal, lateral, longitudinally cleft near the edge of the mandibles, and covered by a membrane; legs slender, with a small naked space above the knee; toes entirely divided; the exterior and middle one rarely united.

Ryncha variegatus. Variegated Snipe. Pl. 71, f. 18. Bill longer than the head, gibbous towards the point, greatly compressed, inflected, upper mandible furrowed throughout, the under one at the point only; nasal furrow reaching the middle of the bill; tongue as long as the bill, acute; nostrils linear; tarsus longer than the middle toe; toes entirely divided; hallux articulated on the tarsus.

Eurypyga Helias. Variegated Helias. Pl. 71, f. 16. Bill long, straight, hard, compressed, point a little tumid; nasal furrow very deep; lower mandible sulcated at the sides; point notched; nostrils basal, linear, long; legs long, slender, tarsus longer than the middle toe; external toe united by a membrane, internal divided, all provided with membranaceous borders; hallux on a level with the toes; tail very long.

Rallus Virginianus. Virginian Water-rail. Pl. 72, f. 19. Bill longer than the head, slender, slightly arcuated, or straight, compressed at the base, cylindrical at the point; upper mandible channelled; nostrils lateral, longitudinally cleft in the furrow, half closed by a membrane; legs long, strong, a small naked space above the knees; toes entirely divided; hallux articulated to the tarsus; wings rounded, third and fourth quills longest.

Gallinula Martinico. Martinico Gallinule. Pl. 71, f. 17. Bill shorter than the head, compressed, conical, base deeper than broad; ridge advancing on the forehead; points of both mandibles compressed, of equal length; upper slightly bent, the lower one forming an angle; nostrils longitudinally cleft, lateral, placed in the middle of the bill, half closed by a membrane, legs long, naked above the knee; toes long, divided, and provided with a narrow edging.

Parra ænea. Bronzed Jacana. Pl. 71, f. 38. Bill as long as the head, straight, slender, compressed; somewhat inflected towards the tip, base depressed, dilated in front into a naked plate, or elevated crest; mandibles unequal; nostrils oval, lateral, situate near the middle of the bill; legs very long, slender; tibia with a long naked space; toes very long, slender, entirely divided; wings ample.

Porphyrio tavoua. Martinico Porphyrio. Pl. 72, f. 15. Bill strong, hard, thick, conical, nearly as deep as long, shorter than the head; upper mandible dilated, and depressed as it approaches the head; nostrils lateral, placed in the horny substance, nearly round and pervious; legs long, strong; toes in some species very long, quite divided; edged with a very narrow membrane.

ORDER XIV.—PINNATIPEDES.

Bill straight, of medium size; upper mandible slightly curved at the tip; legs middle-sized; tarsus slender, or compressed; three anterior and one hind toe, which is anteriorly articulated on the tarsus.

Fulica Americana. American Coot. Pl. 71, f. 20. Bill of medium size, strong, straight, conical, compressed, much deeper than broad at the base; ridge projecting in front, and dilated into a naked plate; mandible of equal length, the upper slightly curved, dilated at the base, lower one forming an angle; nostrils lateral, placed in the middle of the bill, longitudinally cleft, half closed by a membrane; legs long, slender, naked above the knee; toes long, united at their base with scolloped membranes along their sides.

Podoa Senegalensis. Senegal Podoa. Pl. 72, f. 23. Bill as long as the head, cylindrical, straight, acuminate; point notched; ridge distinct, nasal furrow large; nostrils lateral, and nearly central; legs short, placed very far back; tarsus rounded; toes united by a lobed membrane; hallux smooth; tail very broad.

Phalaropus Hyperboreus. Hyperborean Phalarope. Pl. 72, f. 62. Bill long, straight, slender, weak, depressed at the base, mandibles channelled to the point; tip of the upper bent down on the lower, obtuse, point of the lower one subulate; nostrils basal, lateral, oval, prominent, surrounded by a membrane, legs medium-sized, slender, tarsus compressed; toes connected to the first joint, from whence they are provided with scolloped serrated membranes; hallux destitute of a membrane.

Podiceps cornutus. Horned Grebe. Pl. 72, f. 18. Bill medium-sized, straight, compressed, hard, in the form of an elongated, acuminated cone; upper mandible slightly inclined at the point; nostrils lateral, concave, oblong, closed behind by a membrane; legs long, open in front, pervious, placed far backwards; tarsus greatly compressed; toes much flattened, provided with a simple lobe; hind toe compressed and scalloped; claws broad, very flat; wings short, destitute of a tail.

ORDER XV.—PALMIPEDES.

Bill variously formed; legs short, placed more or less backwards; anterior toes wholly or partially connected by webs; in some families all the toes are united by one membrane; hallux articulated interiorly to the tarsus, or wanting in some genera.

Cereopsis cinereus. New Holland Cereopsis. Pl. 72, f. 16. Bill very short, strong, depth at the base nearly equal to its length, covered by a cere, prolonged towards the point, which is arcuated and truncated; nostrils open, placed in the middle of the bill; tarsus longer than the middle toe; toes palmated, with deeply notched membranes; hallux long, articulated to the tarsus; claw thick, strong; wing coverts nearly as long as the wings.

Chionis necrophagus. White Sheathbill. Pl. 71, f. 44. Bill strong, conico-convex, compressed, inclining towards the point, hard; base of the upper mandible covered by a movable corneous sheath, with longitudinal furrows; nostrils marginal, placed in the middle of the bill, on the edge of the corneous substance; naked part of the tibia small; middle and exterior toes semipalmated, anterior one united only at the base, all provided with a rudimentary border; wings tuberculated.

Rynchops flavirostris. Yellow-billed Skimmer. Pl. 71, f. 33. Bill long, straight, compressed into a blade-like form, truncated at the apex; upper mandible much shorter than the under one; nostrils remote from the base, lateral and marginal, tarsus slender, longer than the middle toe; toes united by a membrane; hallux articulated to the tarsus; tail bifurcated, shorter than the wings.

Sterna minuta. Lesser Tern. Pl. 71, f. 32. Bill as long, or longer than the head, nearly straight, compressed, slender, edged and acuminate; mandibles of equal length, upper slightly inclining towards the tip; nostrils placed in the middle of the bill, longitudinally cleft, pervious; legs small, naked above the knee; tarsus very short, toes connected by a membrane, hallux detached; wings very long and pointed; tail somewhat forked.

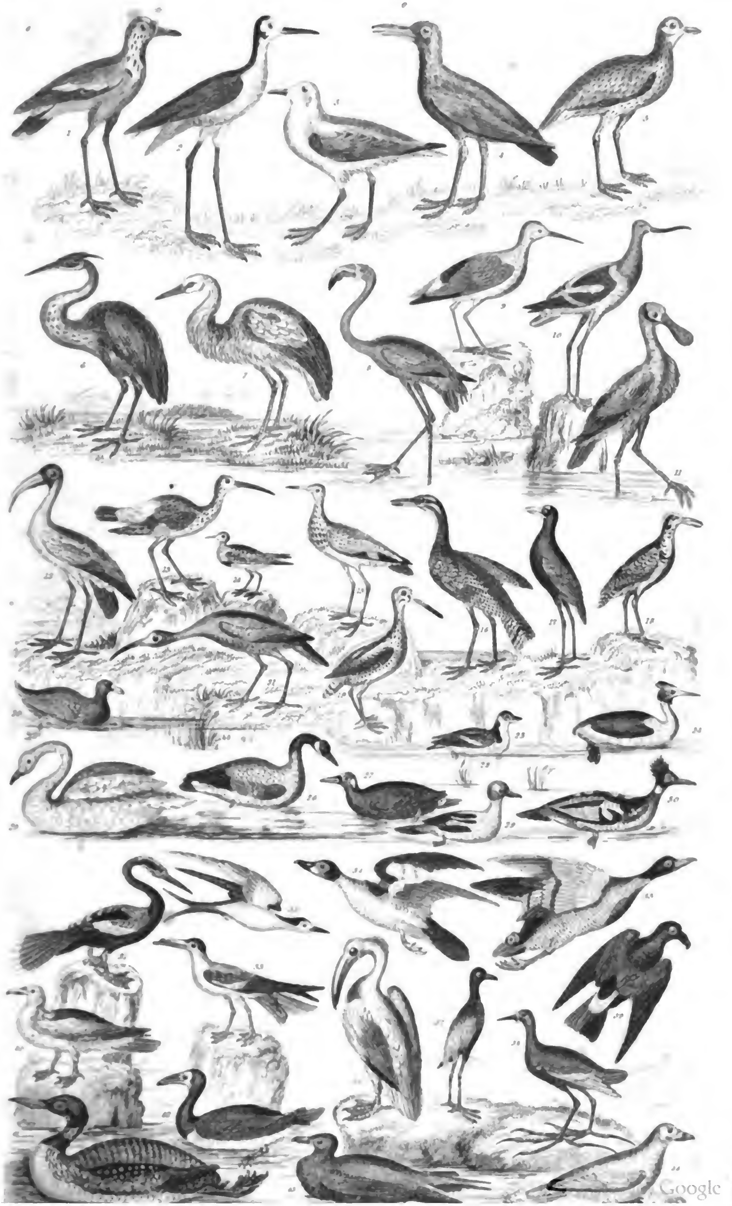
Larus glauca. Burgomaster Gull. Pl. 71, f. 40. Bill long, or medium-sized, strong, hard, compressed, edged, bent towards the point; lower mandible angulated near the tip; nostrils lateral, situate in the middle of the bill, longitudinal, straight, pervious; legs slender, naked above the knee, tarsus long, toes webbed to the tips; hallux free, short, articulated high on the tarsus; wings long; tail equal.

Lestris Richardsonii. Richardson's Skua. Pl. 71, f. 43. Bill medium-sized, cylindrical, strong, hard, sharp-edged, compressed, hooked at the point; upper mandible covered with a cere as far as the horny tip, the lower angulated; nostrils placed immediately behind the horny tip or dertrum, diagonal, narrow, pervious, closed behind; legs slender, naked above the knees; tarsus long; toes completely webbed, hallux very small, and on a level with the toes; claws large, greatly hooked, tail slightly rounded, central feathers elongated.

Procellaria obscura. Diving Petrel-Puffin. Pl. 72, f. 24. Bill as long, or longer than the head, edged, very hard, base dilated; point compressed, arcuated, channelled, abruptly inflected towards the point; nostrils prominent at the surface of the bill, united and concealed by a tube, presenting either a double or single aperture; legs medium-sized, frequently long, slender, with the tarsus compressed; toes long, entirely webbed, hallux represented by an acuminate claw; wings long.

ORNITHOLOGY.

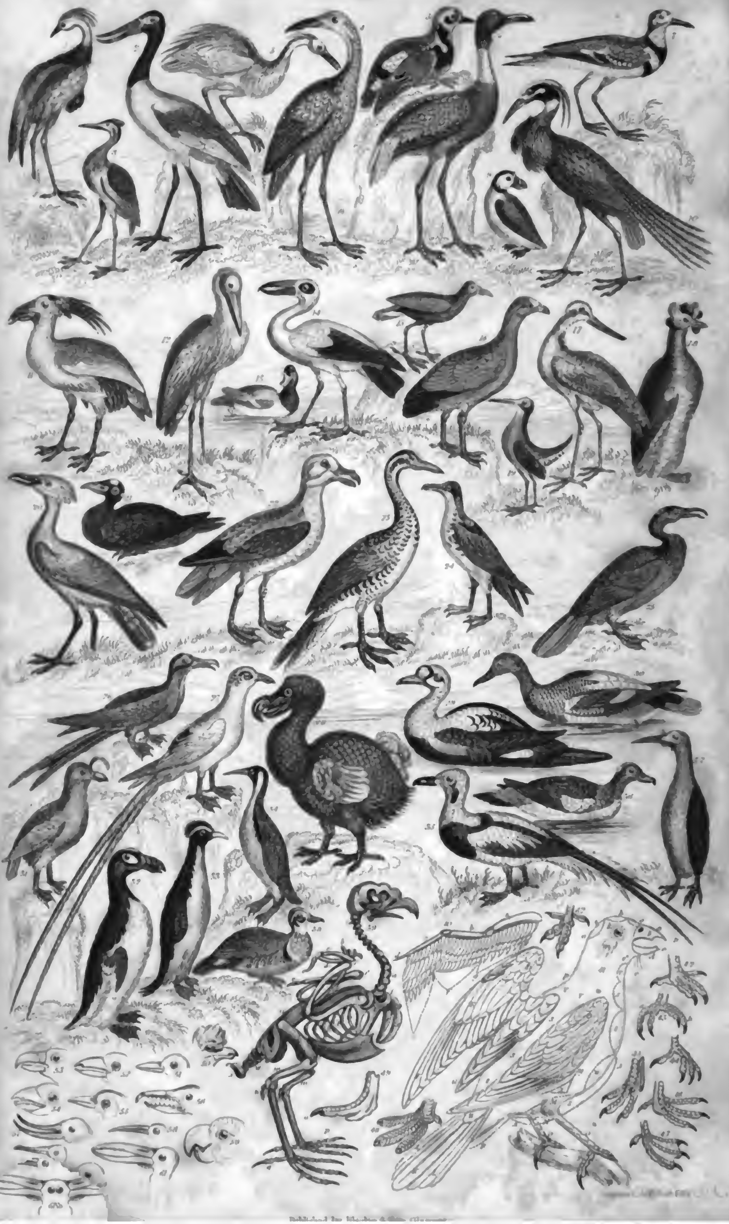
PLATE LXX



Google

ORNITHOLOGY

PLATE LXXII



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Thalassidroma Wilsonii. Wilson's Storm-Petril. Pl. 71, f. 39. Bill shorter than the head, greatly compressed in front of the nasal sheath, point of upper mandible abruptly hooked. that of the lower one slightly angulated, following the curve of the upper; nostrils situate in a sheath, with two apertures in front; tarsus long, slender; toes united by a membrane, exterior and middle ones nearly of equal length, and longer than the interior; hallux represented by a small straight nail; wings long, acuminate, first quill shorter than the third, second longest; tail square, or slightly forked.

Pachyptila Fosteri. Foster's Pachyptila. Bill thick, strong, greatly depressed, very broad; upper mandible gibbous at the sides, interior margin provided with cartilaginous plates; ridge distinct, compressed, point hooked; nostrils basal, placed in a tube, exhibiting two apertures; toes united by a deeply cut membrane; hallux represented by a claw.

Halidroma Urinatrix. Diving Halidroma. Bill short, straight, compressed, margined, longitudinally furrowed, tip hooked; lower mandible with a small, dilatable, naked pouch; nostrils distinct, base concealed under a tube; legs short; feet with three anterior palmated toes only; wings short.

Diomedea exulans. Wandering Albatross. Pl. 72, f. 22. Bill very long, strong, margined, compressed, straight, suddenly curved; upper mandible channelled on the sides, greatly hooked at the point, under one smooth, truncated at the tip; nostrils remote from the base, lateral, tubular, covered on the sides, open in front; legs short; feet with three long, webbed toes only, lateral one margined; wings very long and narrow; quills short, secondaries long.

Anas bochas. Mallard. Pl. 71, f. 35. Bill longer than the head, depressed; broad, straight from the nostrils to the point; mandibles with tooth-like laminæ, those of the upper mandible hardly projecting beyond the margin; nostrils nearly basal, lateral; wings of medium length, acuminate, toes webbed, hallux free; tail short, slightly cuneiform; middle feathers curled up in some species.

Merica Americana. American Wigeon. Pl. 72: f. 36. Bill shorter than the head, higher than broad at the base; strait from the nostrils; depressed and narrowed towards the point, which is armed with a medium-sized hooked nail; mandibles with lamelliform teeth, points slightly projecting beyond the margins, in the centre of the bill; nostrils almost basal, lateral, small, oval, pervious; three anterior toes united by a membrane; hallux with a narrow web, resting with its tip on the ground; wings acuminate; tail wedge-shaped, acute, consisting of fourteen feathers.

Chauliodus strepera. Gadwell. Pl. 72, f. 30. Bill length of the head, depressed, as broad as high at the base, rather narrowing towards the tip, which is provided with a small nail, both mandibles acuminate, those of the upper one projecting beyond the margins; nostrils nearly basal, lateral, oval, and pervious; toes webbed; hallux small and free.

Dendronessa Sponsa. Summer Duck. Pl. 72, f. 38. Bill shorter than the head, considerably narrowed towards the tip, height at the rictus greater than its width; its frontal angles prolonged, mandibles strongly teethed; nail on the tip robust, arched or hooked; nostrils large, pervious, lateral; forehead sloping, tarsus length of middle toe; toes united by a membrane, hallux articulated high on the tarsus, nails narrow, slightly bent and sharp; wings shorter than the tail, which consists of sixteen wide, rounded feathers.

Somateria spectabilis. King Eider. Pl. 72, f. 29. Bill inflected, and elevated at the base, extending high up the forehead, forked or divided by an acute angle of feathers, before the nostrils strait, semi-cylindrical, terminated by a strong vaulted nail, hooked and rounded at the extremity, both mandibles with lamelliform, strong, widely set tooth-like plaits; nostrils in the centre of the bill, small, and oval; legs short, toes webbed, exterior nearly as long as the middle one; hallux with a long, lobated membrane; wings medium length, acute, first quill longest; tail of fourteen feathers.

Oidemia perspicellata. Surf Duck. Pl. 72, f. 21. Bill inflected, or tuberculated at the base, large, elevated, and strong; point much depressed, terminated by a large flat nail, with its extremity rounded, and slightly reflected; mandibles laminated, plates strong, broad, and widely set; nostrils lateral, elevated, oval, situate near the centre of the bill; legs placed far behind the centre of gravity; tarsus short; feet large, webbed, exterior toe as long as the middle one, longer than the tarsus; hallux with a large lobate marginal membrane; wings of medium length, concave, acute; tail short, graduated, acute.

Fuligula marila. Scaup Duck. Pl. 72, f. 13. Bill as long as the head; slightly elevated at the base, broad, depressed towards the point, which is round, and armed with a small deflected nail; mandibles laminated, plates broad, concealed by the deflected margins of the bill; nostrils nearly basal, lateral, oblong, small; tarsus much shorter than the middle toe; feet large, webbed, exterior and middle toes of equal length; hallux with a large, lobate membrane; wings concave, acute, first and second quills nearly equal; tail short, rounded, of fourteen or sixteen feathers.

Clangula albeola. Buffle-headed Garrot. Pl. 72, f. 29; and *C. Vulgaris*, Golden-eye Garrot. Pl. 71, f. 34. Bill shorter than the head, elevated at the base, tapering towards the point; nail of medium length, scarcely projecting beyond the edge of the mandible; mandibles with lamelliform teeth, widely set, concealed by the projecting margins of the bill; nostrils lateral, oval, in the anterior and lower part of the membrane; head large and high; legs short, toes long, webbed, middle and exterior ones of nearly equal length; hallux lobated.

Harelda glacialis. Long-tailed Hareld. Pl. 72, f. 35. Bill much shorter than the head, high at the base, narrow, abruptly contracted towards the point; nail arcuated; mandibles with laminated, wide set, tooth-like processes; nostrils nearly basal, lateral, linear, oblong, legs short; toes webbed; exterior toe nearly as long as the middle one; hallux with a large lobated membrane; wings of medium length, first and second quills equal; tail cuneiform, feathers acuminate, two central feathers elongated in the male.

Mergus serrator. Red-breasted Merganser. Pl. 71, f. 30. Bill medium-sized, or long, slender, in the form of an elongated cone, nearly cylindrical; base broad; point of upper mandible greatly hooked, and furnished with a strong nail; edges of mandibles serrated, the teeth recurved; nostrils lateral, situate towards the middle of the bill; legs short, placed backwards on the abdomen; toes completely webbed, hallux articulated on the tarsus.

Anser Canadensis. Canada Goose. Pl. 71, f. 26. Bill as long, or shorter than the head, deeper than broad at the base, and narrowed towards its extremity; entirely covered with a cere, or naked skin, with the exception of the nails of the mandibles, which are distinct and horny; laminæ of the upper mandible exposed; nostrils large, elliptical, longitudinal, placed near the middle of the bill; neck longer than in the genus *Anas*, and shorter than in *Cygnus*; legs longer than the former, and placed farther backwards; wings long, ample, tuberculated; toes palmated; hallux free, and articulated upon the tarsus, scarcely touching the ground with its tip; middle toe longest; nails falcate, dilated at the edges.

Cygnus Bewickii. Bewick's Swan. Pl. 71, f. 25. Bill equally wide throughout its length, much higher than broad at the base, where it is inflected and tuberculated, depressed towards the point; nail of upper mandible deflected, and covering that of the lower, which is flat; both mandibles with lamellated teeth placed transversely, and nearly concealed when the bill is closed; nostrils in the middle of the bill, oblong, lateral; legs short, placed behind the equilibrium of the body; toes entirely webbed; hallux small and free; wings long and ample.

Pelecanus ornocrotalus. White Pelican. Pl. 71, f. 36. Bill long, straight, broad, greatly depressed; upper mandible flattened, with a very strong hooked nail at its point, the lower formed by two bony branches, which are depressed, flexible, and united at the tip; from these branches are suspended a naked skin, in the form of a pouch, capable of great expansion; face and throat naked; nostrils basal, in the form of a narrow longitudinal slit; legs short and strong; all the four toes connected in a web.

Carbo graculus. Shag. Pl. 72, f. 25. Bill medium-sized or long, straight, compressed; upper mandible greatly bent at the point, and furrowed from the base to the tip; the lower one compressed; a membrane investing the base of the bill, extending to the throat, which, with the face, is naked; nostrils basal, linear, concealed; legs short, strong, placed far behind; the four toes included in a web, middle claw serrated; wings of medium length, first quill shorter than the second, which is the longest; tail rounded, of medium length, stiff and elastic.

Tachypetes aquila. Frigate Bird. Pl. 72, f. 26. Bill long, strong, edged, depressed at the base, and compressed at the sides, with a sutura above; tips of both mandibles strongly curved, the upper one terminated by a pointed hook; nostrils more or less concealed, and linear; legs placed far back, very short; tarsus shorter than the toes, and half feathered; toes long, and half wabbed; hallux articulated on a line with the toes, and semi-webbed; wings very long, straight; tail greatly furcated.

Sula fusca. Brown Gannet. Pl. 71, f. 42. Bill long, strong, in the form of an elongated cone, belog thick at the base, compressed near the point, which is obliquely curved; edges of mandibles serrated; mouth very wide, cleft beyond the eyes; face and throat naked; nostrils basal, linear, concealed; legs short, strong, placed far behind, all the toes connected by a web; claw of middle toe serrated; wings long; tail conical, consisting of twelve feathers.

Plotus anhinga. White-bellied Darter. Pl. 71, f. 31. Bill long, quite straight, slender, fusiform, acuminate; edges of upper mandible dilated at the base, but otherwise compressed and inflected; both mandibles finely serrated. nostrils linear, concealed in a shallow groove; legs short, thick, strong, tarsus considerably shorter than the middle and outer toe, all the toes connected by a web; wings long, tail very long.

Phæton phœnicurus. Common Tropic Bird. Pl. 72, f. 27. Bill length of the head, thick, strong, sharp at the edges, greatly compressed, slightly sloping from the base, acuminate; edges of mandibles dilated at the base, compressed and serrated the rest of their length; nostrils basal, lateral, pervious, covered above and near the base by a naked membrane; legs very short, placed far back; all the toes connected by a web; wings long; tail short, but with two very long filamentous central feathers.

Colymbus glacialis. Great Northern Diver. Pl. 71, f. 41. Bill medium-sized, straight, much acuminate, compressed; nostrils basal, lateral, concave, oblong, half closed by a membrane; legs placed far behind; tarsus compressed; toes very long, webbed; hallux short, with a loose rudimentary web· wings short; tail very short, and rounded.

Uria alle. Little Guillemot. Pl. 71, f. 23. Bill of medium size, or short, strong, straight, acuminate, compressed; upper mandible slightly bent towards the point, lower, forming an angle more or less open; nostrils basal, pervious, lateral, concave, longitudinally cleft, half closed by a broad feathered membrane; legs short, placed far behind; tarsus slender; feet with three anterior toes only, entirely webbed; wings short.

Phaleris cristatellus. Tufted Starikl. Pl. 72, f. 31. Bill shorter than the head, depressed, sides dilated, nearly quadrangular, notched at the point, lower mandible forming a salient angle; nostrils pervious, in the middle of the bill, near the ridge, linear, half concealed; legs short, placed far behind; tarsus slender, with three anterior toes only; claws greatly bent; wings of medium size, first quill longest.

Mormon fratercula. Puffin. Pl. 72, f. 9. Bill shorter than the head, deeper than long, greatly compressed; both mandibles arcuated, transversely furrowed, and notched towards the point; ridge of the upper mandible elevated above the level of the skull; nostrils lateral, marginal, linear, nearly concealed by a large naked membrane; legs short, placed far behind, provided with three anterior webbed toes only; claws greatly hooked; wings short.

Alca impennis. Great Auk. Pl. 72, f. 32. Bill straight, broad, compressed, much bent towards the tip, both mandibles half covered with feathers, and grooved near the point, upper mandible hooked, the lower forming a salient angle; nostrils placed in the middle of the bill, lateral, marginal, linear, almost entirely closed by a membrane, and covered with feathers; legs short, placed far behind, with three palmated anterior toes only; wings short.

Spheniscus chrysocome. Crested Penguin. Pl. 72, f. 33. Bill shorter than the head, compressed, very thick, strong, straight, hooked at the tip, obliquely grooved; edges of both mandibles inflected, the under one covered with feathers at the base, with the tip truncated; nostrils situate near the centre of the bill, and cleft in the furrow; legs very short, placed far behind, with four anterior toes, of which three are connected by a deep web, the fourth being little more than a tubercle; wings incapable of flight.

Apterodytes Patachonica. Patagonian Penguin. Pl. 72, f. 34. Bill shorter than the head, slender, straight, inflected at the tip; upper mandible furrowed throughout its length, the under wider at the base, and covered with a naked and smooth skin; nostrils placed in the upper part of the bill, concealed by the feathers of the forehead; legs very short, thick, situate very far behind, with four anterior toes, three of which are webbed, and the fourth very short; wings incapable of flight.

ORDER XVI.—INERTES.

Bill variously formed; body apparently thick, covered with down and feathers, with distant webs; legs placed far behind; tarsus short; three toes before, divided to the base, hallux short, articulated exteriorly; claws thick and sharp; wings not formed for flight.

Apteryx Australis. Australian Apteryx. Pl. 72, f. 37. Bill very long, subulate, soft, furrowed its whole length, inflected and gibbous at the point; base covered by a crinated cere; nostrils placed near the point of the upper mandible, at the termination of a tubular furrow; legs short, feathered to the knees; wings rudimentary, terminated by a spur.

Didus ineptus. Dodo. Pl. 72 f. 28. Bill long, strong, broad and compressed; upper mandible bent at the point, transversely furrowed, lower mandible straight, gibbous, bent upwards at the point; nostrils placed in the centre of the bill, lying obliquely in a furrow; tarsus short; three anterior divided toes; hallux short, claws short and bent; wings not formed for flight.

ORNITHORYNCHUS. See *Platypus*.

OROGRAPHY (from ὄρος, a mountain, and γράφω, I write); the description of mountains, their chains, branches, &c. The most ancient, and perhaps the most accurate, method of measuring the heights of mountains, is by trigonometrical survey. The great difficulty to be encountered in this method of measurement arises from the optical delusion occasioned by the different states of the density of the atmosphere, causing a proportionate change of refraction, which may, however, be corrected by hygrometric observation. In modern times, it has been usual to ascertain the heights of mountains by barometrical observation, as being much more convenient, and sufficiently correct for all practical purposes. There is a proportionate relation between the height of the mercury in the barometer, and the altitude of the point of observation, which may guide in ascertaining within certain limits the acclivities and declivities of any line of travel, so that by observing the rises and falls in the barometer, and noting the distances, an outline may be obtained of the profile of the tract. Corrections have to be made for variations of temperature, humidity, and latitude, for ascertaining which, many experiments have been made, and formulæ deduced for the guidance of the observer. For an easy rule for such observations, see our article *Barometer*, and for tables to facilitate calculation, see De la Beche's Geology.

ORONOKO. See *Orinoco*.

ORPHAN ASYLUMS; establishments in which orphans who have not relations able to support them are provided for and educated. The care which society at large is bound to take of destitute orphans is, in many countries, an important point of political economy. The question of most consequence, in relation to the public support of orphans, is, whether it is best, in a moral, physical, and economical point of view, to bring up large numbers of orphans in great establishments, where they live together, or to put them out singly in trust-worthy families, paid by the community. In Germany, this question has been long and thoroughly discussed; and it appears that the majority of persons in that country, conversant with the subject, prefer the plan of bringing them up in separate families. Both systems have their inconveniences and advantages. It would appear to be cheaper, as well as better for the morals of orphans, to educate them in separate families; and, in the way in which asylums have been generally conducted on the continent of Europe, the health of the children has appeared not to be so well taken care of as in families. Some asylums, however, form brilliant exceptions, as the great asylum at Potsdam, near Berlin. The history of the origin of orphan asylums is uncertain. What the Romans understood by *pueri* and *puellæ alimentarii*, cannot properly be compared to our publicly supported orphans. Trajan, who did much in favour of orphans, both the Antonines, and Alexander Severus, established foundations for them; but such institutions do not seem to have become frequent till the introduction of the Christian religion. In the middle ages, however, in which so many institutions beneficial to mankind originated within the walls of thriving and opulent cities, orphan asylums became frequent in such places, particularly in the larger commercial towns of the Netherlands. In Germany, the first asylums are found in the free cities; yet their origin does not go beyond the sixteenth century. One of the most famous asylums in the world is that established by A. H. Franke (q. v.) at Halle, in 1698. In Britain, there are few asylums exclusively appropriated to orphans, these being generally disposed of in our poor-houses, &c.

ORPHEUS; one of the old sages and bards of the Greeks (about forty years before the Trojan war); according to common accounts, the son of the muse Calliope and the Thracian river-god Oagrus; according to others, of Apollo. He was educated by Linus, together with Thamyris and Hercules. His melodious voice, and his lyre with seven strings, as the story says, drew after him rocks and trees, tamed the wildest animals of the mountain forests, and calmed the whirlwinds and tempests. Some poets mention him as a king of Thrace; and the *Argonautica* (which goes under his name, though unquestionably a later production) calls him the sovereign of the Ciconians, rich in herds. Ovid also represents the ceremony of his marriage with Eurydice, or Agriope, as having taken place there. After the death of his beloved wife, the disconsolate poet wandered over the earth. When he returned home, the Ciconian women, who felt his grief as an insult, were so much excited, during the celebration of Bacchanalian orgies, that they seized the young man, and tore him to pieces in their madness. According to the *Argonautica*, on the contrary, Orpheus had already reached a venerable old age when he sailed for Colchis. He had previously visited several other countries, and especially Egypt. Enriched with knowledge, he returned, and instituted among the Greeks the Dionysian and other mysteries. He amended and regulated their religious doctrines, and led a life of singular purity. He was the inventor or maker of the lyre, the oldest musical instrument adapted to soften the fierceness of savage minds. The ancients frequently mention his works, yet it is certain that he never wrote any thing; but his ideas, his doctrines, and fables, thrown into a poetical form, have been handed down by tradition. At a very early period, poems ascribed to Orpheus were in circulation throughout Greece; but, even in ancient times, doubts were felt with regard to their authenticity; and it is probable that, as early as the age of Aristotle, none of them were entirely authentic, but that they contained portions of the poet's doctrines. We possess, under the name of Orpheus, an *Argonautica* (edited by Schneider, Jena, 1803); some sacred hymns; a work upon the properties of minerals, probably of the fourth century after the Christian era (edited by Tyrwhitt, London, 1781), and several fragments. The best edition of these works is that of Hermann (Leipsic, 1805). The Orphic poetry embraces the whole cycle of the esoteric religious doctrines, and the doctrines of the mysteries.—See George Henry Bode's *Orpheus, Poetarum Graecorum antiquissimus*, a prize essay (Gottingen, 1824, 4to).

ORR, Hugh, was born January 13, 1717, at Lochwinnoch, in the county of Renfrew, Scotland. He was educated a gunsmith and house-lock filer; and at the age of twenty went to America. One year he resided at Easton, Massachusetts, and the next he removed to Bridgewater. There he built a shop, and set up the first tilt-hammer in that part of the country, where he was for several years the only maker of edge tools, of which he manufactured many sorts. In 1748, he made five hundred muskets for the province of Massachusetts Bay, and, during the revolutionary war, commenced anew the manufacturing of arms. In concert with a French gentleman, he set up a foundery for the casting of cannon. These were cast solid and bored: most of them were iron; a few were brass. A great quantity of cannon-shot was also cast at the same furnace, and, together with the cannon, formed a valuable acquisition to the country at that period. Besides spreading the manufacture of edge tools through various parts of Massachusetts, Rhode Island, and Connecticut, Mr Orr originated the business of exporting flax-seed from the part of the country in which he resided, and probably gave the first impulse to the manufacturing of cotton. For several years, he was elected a senator for the county of Plymouth, and enjoyed the intimacy and confidence of governor Bowdoin. He died in December, 1798, in the eighty-second year of his age. In private life, he was exemplary; and his attachment to his adopted country was pure and ardent.

ORRERY, an astronomical instrument for exhibiting the motions of the heavenly bodies, was first constructed by Graham; but its name is derived from one made by Rowley for the earl of Orrery, which was supposed by Sir R. Steele to be the first ever constructed; and he therefore gave it the above name, in honour of the earl, whose name it has ever since retained, though the error on which it was adopted has long been corrected. The principal use of the orrery, is to illustrate the theory of the earth and moon, and to render it obvious and intelligible,—to exhibit to our senses the manner in which all these changes and phenomena take place, which depend on the annual and diurnal revolution of the earth, and the monthly revolution of the moon. It is so constructed, therefore, as to represent all the variety of the seasons; the vicissitudes and lengths of days and nights, also the nature of eclipses of the sun and moon, and various other phenomena. By means of this apparatus, many individuals who have not sufficient leisure to apply themselves to the study of astronomy, may, in the course of a short time, attain to a complete knowledge of several of the most remarkable appearances of the heavenly bodies, which otherwise might remain to them mysterious and inexplicable. Various forms of this instrument have been invented; but of these, the two that have been most approved of are the whole and the half sphere planetarium. At first this machine appears to have been constructed without any sphere, and with nothing more than the sun, having the earth and moon revolving around it; but soon after it was invested with half a sphere, and then with a whole sphere, in order to exhibit a more full and correct representation of the celestial bodies and of the whole solar system.

An improved orrery was invented by Mr Huygens, and is still preserved in the university of Leyden. It represents the revolutions of the five primary planets about the sun, and that of the moon about the earth, so that the situations of the planets, with their conjunctions and oppositions, are clearly seen and discovered for any time past, present, or to come. About the middle of the last century, Ferguson, the self-taught astronomer, constructed a variety of orreries, much esteemed for their accuracy and ingenuity. In 1791, an elaborate machine of this sort was exhibited in London, representing all the most remarkable motions, revolutions, and phenomena of the universe. This piece of mechanism exhibited the whole phenomena of the solar system, with the satellites of the earth, Jupiter, and the other planets, preserved in constant motion by a chronometer, even to the very diurnal rotation of the planets, and the unequal motions in their elliptic orbits. The merit of this machine is due to the celebrated M. Hahn, of the academy of sciences at Erfurt, who left it unfinished, but it was afterwards completed by M. A. de Mylius. This orrery was purchased by the British government, and sent out with lord Macartney, among other curiosities of his embassy, as a present to the emperor of China. Within the present century, many ingenious orreries have been constructed, among which, that of Mr Fulton, a self-taught artist in Fenwick, Ayrshire, may be considered the most remarkable. His machine exhibits the annual and diurnal motions of all the planets, the motions of the satellites in their proper periodic times and due degrees of inclination. By means of an engraved plate, all the planets and satellites may be placed in their proper relative positions for any given time, and by the application of a chronometer, this orrery may be made to exhibit the real aspect of the solar system at the exact period on which it may happen to be examined. Many attempts have been made to produce what are called transparent orreries, by means of the magic lantern; but to say the least of it, these are calculated—if for any thing—more to amuse than to instruct.

The difference between an orrery and a planetarium is understood to consist in this, that a planetarium exhibits by wheel-work the periodic or tropical revolutions of the primary planets round the sun, without any reference to their rotations, whereas the orrery gives, besides the revolutions of the primary planets, the revolutions of some or all of the secondaries, and the rotation of the earth, together with the moon's anomalistic revolution, and her revolution with respect to the period of the retrograde motion of the nodes. Hence the orrery, when constructed on its most comprehensive plan, may be said to comprise within itself the planetarium, the tellurium, the lunarium, and the machine for Jupiter's satellites.

ORRERY (Charles Boyle), earl of, second son of Roger earl of Orrery, was born, in 1676, at Chelsea, and, at fifteen, entered at Christ-Church, Oxford. While there, he published a new edition of the epistles of Phalaris, of which doctor Bentley questioning the authenticity, he wrote an answer entitled Doctor Bentley's Dissertation on the Epistles of Phalaris examined, which produced the controversy with doctor Bentley (q. v.), in which the wit was all on one side and the truth on the other. On the death of his brother, he succeeded to the earldom, and, in 1709, was sworn of the queen's privy council. He was also envoy-extraordinary from the queen to the states of Flanders and Brabant, at the critical period of the treaty of Utrecht, and, on his return, was raised to the dignity of a British peer, under the title of *lord Boyle*. He retired from court soon after the accession of George I., and, in 1722, was sent to the Tower on suspicion of being concerned in Layer's plot, but was discharged after six months' imprisonment. Besides the edition of Phalaris, he published a comedy, called, *As you find It*, and some verses. He died in 1731. His name has been given to a well-known astronomical instrument invented by Graham. See *Orrery*.

ORRIS ROOT; the root of a white flowering species of iris, the *I. Florentina*, a native of the south of Europe. In a dried state, it is well known, on account of its communicating a grateful odour, resembling that of violets. It was formerly much employed in medicine, but is now little valued except as a perfume. It is exported from the Mediterranean in considerable quantities, and, among other uses, is employed in the manufacture of hair-powder.

ORSINI; one of the most celebrated princely families in Italy, and which, in former times, had large possessions in Hungary. In the eleventh century, it held a brilliant rank among the Roman nobility, and, in spite of the rivalship of the powerful family of Colonna, maintained its splendour under the protection of several popes who belonged to it. The founder was John Cajetan, whose descendant Matthew Rubens had three sons, who founded three lines, of which there remains at present only one, that of Orsini-Gravina, derived from Napoleon Orsini, the youngest son of Matthew. Francis Orsini (descended from this Napoleon) was made, in 1417, count of Gravina, a city in the Neapolitan district of Bari. His son James obtained the title of *duke*. The eleventh duke after him, Peter Francis, in 1667, gave up the dukedom of Gravina to his brother Dominicus, and, in 1724, was chosen pope. He ruled, under the name of *Benedict XIII.*, until 1730, when another Orsini (Clement XII.) obtained the triple crown. The latter raised the nephew of Benedict XIII., prince Beroald Orsini, to the dignity of prince of the papal see, after the emperor Charles VI. had already, in 1724, made him a prince of the German empire. The seat of the family was commonly in Naples. The family has given several distinguished men to Italy, among whom Nicholas Orsini and his cousin Lorenzo obtained some reputation in the war of Venice against the league of Cambray. The former distinguished himself by taking and violently defending Padua, in 1509, against the emperor Maximilian I.; and the latter was the first who disciplined the Italian infantry, so that they could stand the attacks of the formidable Swiss and Spanish troops.

ORT (German for *place*); appearing in geographical names, as *Fredericsort*.

ORTHITE; (ὀρθός, straight) because it always occurs in straight layers, generally in feldspar. It bears a strong resemblance to gadolinite, and consists of peroxide of cerium 19·5, protoxide of iron 12·44, protoxide of manganese 3·44, yttric 3·44, silex 32·0, alumine 14·8, lime 7·84, water 5·36. It is found in the mine of Finbo, in the vicinity of Fahlun, in Sweden.

ORTHODOXY (from the Greek ὀρθόδοξος, from ὀρθός, right, and δόξα, opinion), used only in religious matters, signifies just notions on religious subjects. Such sects, therefore, as claim to be solely in possession of religious truth can admit no others to be orthodox. In the Roman Catholic understanding of the word, he is orthodox who believes what the church believes and teaches; what is contained in the gospel, the traditions, the decrees of the councils, and the silent agreement of the church. The Greek Catholics call, in their turn, themselves *orthodox*, and the Roman Catholics *heterodox*. In Britain, the word is often used to designate Calvinists, as well by themselves as by people not belonging to their sect. See *Heretics*, *Acatholici*, and *Heterodox*.

ORTHOGRAPHIC PROJECTION OF THE SPHERE is that projection which is made upon a plane passing through the middle of the sphere, by an eye placed vertically at an infinite distance.

ORTHOGRAPHY; that part of grammar which teaches the nature and properties of letters, and the just method of spelling or writing words, making one of the four greatest divisions or branches of grammar.

ORTHOPÆDIC INSTITUTES; the name given by the Germans to establishments devoted to the cure of deformities, chiefly those of the spine, ribs, and pelvis. The word is from ὀρθός (straight) and παιδεία (the formation of a child). It is a branch of surgery much cultivated of late, and astonishing cures have been effected by perseverance and ingenuity. One of the most perfect of these institutes exists at present at Würsburg, Germany, under Mr Heine.—See his *Réglement intérieur de l'Institutorthopédique dit Carolin* (Würzburg, 1826), and *Historical Account of the Foundation of the Orthopædic Caroline-Institute*, with scientific views respecting deformities of the human body. The cases subjected to treatment in that institute are, 1. the crooked neck (*caput obstipum*); 2. curvature of the spine towards one side (*scolosis*); 3. curvature of the spine backwards (*kyphosis*); 4. curvature of the spine forwards (*lordosis*); 5. deviation of the ribs and clavicles from their proper situation and connexion; 6. deformities caused by unnatural shortness of the muscles round the hips; 7. deformity from weakness of the spine; 8. unnatural motions of the upper arm in the joints; 9. club hand, and faulty extension and flexion of the hand; 10. crookedness of the upper arm, or fore-arm; 11. contraction of the thigh towards the back; 12. contraction of one thigh towards the other; 13. faulty rotation of the thigh-bone, so that the point of the foot is turned unnaturally outwards or inwards; 14. contraction of the lower leg towards the thigh; 15. knees unnaturally bent, so as to be too far from or too near to each other; 16. club-feet bent inwards (*vari*); 17. club-feet turned outwards (*valgi*); 18. flat feet; 19. crookedness of the thigh-bone and the other bones of the leg; 20. deformities of the lower extremities from weakness; also complication of several of these deformities. There are many orthopædic institutions in Germany and France. That of doctor Leithoff, at Lubeck, is the oldest in Germany.

ORTLES-SPITZE, or ORTLER; a mountain in Tyrol, on the borders of Engadina. By some measurements its elevation is 15,430 feet, the third highest in Europe. Its summit was first reached, in 1802, by Joseph Pichler, a hunter of Passeyr.

ORTOLAN (*emberiza hortulana.*) This bird, so celebrated in the annals of gastronomy, is a native of the southern parts of Europe, though it even visits England, Sweden, &c. It appears to be identical with the *miliaria* of Varro, which was sold at such enormous prices to the epicures of ancient Rome. When killed at the proper time, these birds are very fat, but they are not so much esteemed as when they are caught alive, and artificially brought to their highest degree of perfection. This is done by confining them in a chamber from which the rays of the sun are excluded, and which is lighted by lamps kept constantly burning. There the birds are plentifully supplied with food of the most nutritive kind till they become mere lumps of fat. Their flesh is said to be extremely delicate, but so rich as soon to satiate the appetite. The ortolans are prepared for the table in various ways. Sometimes they are roasted in an eggshell—a method of cookery borrowed from the ancients. A great traffic was formerly carried on from the island of Cyprus in these birds. They are caught in vast numbers in that place, and pickled in casks, each containing from three to four hundred, prepared with spice and vinegar. In some years the number of casks exported has amounted to 400, or, upon an average, 14,000 of these highly-prized morsels. The ortolan is also reared for its vocal talents, which, however, are not of the first order. The ortolan is yellow on the throat and around the eyes; the breast and belly are red; the upper part of the body brown, varied with black.

ORTUS COSMICUS; the rising of the stars, as the expression is used by the ancient poets. As the calendar of the ancients was far from being exact, since the received length of the year differed from the actual length, they found it necessary, at a very early period, to have recourse to other signs of the lapse of time. The rising of the stars was compared with the rising and setting of the sun, and certain regulations were made accordingly. The rule, for instance, of beginning certain agricultural labours on the first day of the year was very inexact, since, for the above-mentioned reasons, that day happened in different parts of the year. On the other hand, the rule was correct to undertake them upon the day when Sirius rises at sunset, since this always happens at the same time of the year. We find, therefore, in the ancient poets and historians, especially those on agriculture, expressions which refer to this division of time. Thus the name of *ortus cosmicus* is given to the rising of a star with the sun; and *ortus acronyctos* means the rising of a star at sunset. See Lalande's *Abrégé d'Astronomie*.

ORVILLE, James Philip d'; an eminent writer on classical literature, was born at Amsterdam, of French extraction, in 1696. He studied at the university of Leyden, and, having determined to devote himself to the belles-lettres, travelled in England, Italy, France, and Germany, visiting the public libraries, and forming an acquaintance with the most celebrated classical scholars. On his return to Holland, about 1730, he obtained the chair of history, rhetoric, and Greek literature, at Amsterdam, which he occupied till 1742. He died 1751. His works are *Miscellaneæ Observationes criticæ novæ*, carried on periodically in conjunction with Burmann; an edition of the Greek romance of Chariton, with a commentary (1750, 4to); and Observations on Sicily, published after the death of the author, by Burmann, under the title of *Sicula* (1764, folio).

ORYCTOGNOSY. See *Mineralogy*.

ORYCTOLOGY; the science of the various formation of mountains; hence it is a branch of geology.

OSAGE, a river of Missouri, rises in the country west of the state, about longitude 97° west, and latitude 36° 30′ north. It flows into the state of Missouri, and joins Missouri river 133 miles above the Mississippi. It has a very winding course, is 397 yards wide at its mouth, and is navigable for boats 600 miles. Much of the land watered by it is very fertile. The two native tribes, the Great Osages and the Little Osages, live in separate settlements on this river, about 400 miles from its mouth. The Great Osages consist of about 3800; the Little Osages 1700. About 150 miles south-west of these settlements are the Osages of Arkansas, nearly 2000 in number. The united foreign missionary society have sent missionaries to the settlements in Arkansas, and in Missouri territory.

OSAGE ORANGE. See *Fustic Wood*.

OSCILLATION, in mechanics; vibration, or the reciprocal ascent and descent of a pendulum.

Axis of oscillation is a right line passing through the point of suspension parallel to the horizon.

Centre of oscillation is that point in a vibrating body in which, if all the matter of the body were collected into it, the vibrations would be performed in the same time as before.

OSIANDER, Frederic Benjamin, one of the most distinguished German professors of midwifery, was born in 1759, at Zell, in the kingdom of Würtemberg. In 1792, he was appointed professor of midwifery in the university of Gottingen, and director of the lying-in hospital, which was established in 1751, and had become the first school of midwifery in Germany. Osiander remained its director for thirty years, during which time about 3000 scholars enjoyed his instructions there. From eighty to a hundred women were received there annually, and it often happened that several years passed without the occurrence of a single death. He published the history of this interesting institution, and a description of all the remarkable cases which occurred from 1794. He died in 1822. Osiander's numerous works, on almost every branch of medicine, are enumerated in Saalfeld's History of the University of Gottingen, from 1788 (Gottingen, 1820), and in Meusel. Among these is Manual of Midwifery (in German), 1796, and Manual of Accouchment (Tubingen, 1818—1821, 2 vols., in German), with a collection of drawings; On the Diseases which took place in the Period of Development of the Female Sex (Gottingen, 1817, and continued, Tubingen, 1820 to 1822, 2 vols.)

OSIER. See *Willow*.

OSIRIS, an Egyptian god. See *Isis*, *Hieroglyphics*, and *Egypt*.

OSMAN. See *Caliph*, and *Ottoman Empire*.

OSMAZOME. If cold water, which has been digested for a few hours on slices of raw muscular fibre, with occasional pressure, be evaporated, filtered, and then treated with pure alcohol, a peculiar animal principle will be dissolved, to the exclusion of the salts. By dissipating the alcohol with a gentle heat, the osmazome is obtained. It has a brownish-yellow colour, and the taste and smell of soup. Its aqueous solution affords precipitates, with infusion of nut-galls, nitrate of mercury, and nitrate and acetate of lead.

OSMELITE; a mineral species found mixed with datholite, in trachytic veins, near Wolfstein, on the Rhine. Hardness between fluor and apatite; specific gravity, 2·79 to 2·83; cleavage visible in one direction only; feels rather greasy. It emits, at the ordinary temperature of a room, a distinct clayey smell, whence its name, *osmelite*, or *smelling stone*.

OSMIUM; a metal discovered by Mr Tennant among platina grains, and thus denominated by its discoverer from the pungent and peculiar smell of its oxide. Exposed to a strong heat in a cavity in a piece of charcoal, it does not melt, nor is it volatile, if oxidation be carefully prevented. With copper and with gold it forms malleable alloys, which are easily dissolved in nitro-muriatic acid, and afford by distillation the oxide of osmium. The pure metal, previously heated, did not appear to be acted upon by acids. Heated in a silver cup with caustic alkali, it combined with it, and gave a yellow solution, similar to that from which it was produced. From this solution, acids separate the oxide of osmium. Oxide of osmium becomes of a dark colour with alcohol, and after some time separates in the form of black films, leaving the alcohol without colour. The same effect is produced by ether, and with greater rapidity. It parts with its oxygen to all the metals except gold and platina. Silver, kept in a solution of it some time, acquires a black colour, but does not deprive it entirely of smell. Copper, zinc, tin, and phosphorus quickly produce a black or gray powder, and deprive the solution of smell and of the property of turning galls blue. This black powder, which consists of the metallic osmium, and the oxide of the metal employed to precipitate it, may be dissolved in nitro-muriatic acid, and then becomes blue with the infusion of galls. If the pure oxide, dissolved in water, be shaken with mercury, it soon loses its smell, and the metal forms a perfect amalgam. By squeezing the superfluous mercury through leather, and distilling off the rest, a dark-gray or blue powder is left, which is the osmium.

OSNABRUCK; a principality of the kingdom of Hanover, formerly a bishopric in the circle of Westphalia, whose bishops, after the peace of Westphalia, were alternately Catholic and Protestant. The principal rivers are the Hase and the Hunte. It has 137,000 inhabitants, with a superficial area of 9100 square miles. The principal place of the same, called also in English *Osnaburg*, lies on the Hase, and is known in history by its having been the place for the conferences of the Protestant ambassadors in concluding the peace of Westphalia (q. v.), in 1648. The population is 10,900, engaged in the manufacture of coarse woollen cloths, leather and tobacco. There are also several linen bleach-fields; and the coarse linens called *Osnaburgs* are brought in from the surrounding country to be measured and stamped. Lat. 52° 16′ N.; lon. 8° 1′ E.; 70 miles W. of Hanover. See *Hanover*.

OSPREY; the fish-hawk. See *Eagle*.

OSSIAN (*Oisian*), the most celebrated of the Celtic bards, real or fabulous, is supposed to have flourished about 300 A. D. He was the son of Fingal, a Caledonian, or, according to the Irish writers, an Irish hero. Ossian is said, like some of the celebrated poets of antiquity, to have been blind, and to have soothed his anguish for the loss of his favourite son, Oscar, by the composition of his songs. His name has derived its celebrity from the publications of Macpherson. (q. v.) In 1760, Macpherson published a volume, entitled Remains of Ancient Poetry, collected in the Highlands of Scotland, and translated from the original Gaelic or Erse Language. He was then sent to the Highlands to make further collections, and, in 1762, published the Fingal, with sixteen smaller poems, and, in 1763, Temora, with five smaller ones. The best edition of these Ossianic poems is that of Campbell, with illustrations (1822). Macpherson declared the poems to be translations from Gaelic odes of the bard Ossian, which had been preserved, partly by oral tradition, and were partly found in manuscripts. The titles are taken from the name of the hero whose deeds they celebrate, or from that of the place where the events occur. Their genuineness was called in question by the reviewers on their first appearance, by Johnson (1775), Shaw (1761), Waller, and more particularly by Laing, in his History of Scotland, and in a separate dissertation on the subject. The other side of the question was taken by Blair, Sinclair, Home, Arthur, Young, &c., who proved that originals of Macpherson's English translations were to be found in the Highlands, and were attributed to Ossian; but there was nothing to show whether it was the same Ossian who flourished in the fourth century. The principal arguments against their genuineness were derived from the state of manners described in them being inconsistent with the wild and barbarous condition of the country; the impossibility of their having been preserved for fourteen centuries by oral communication only, and of their being intelligible, if preserved, to persons acquainted only with the language of their own times. Yet it could not be denied that the poems ascribed to Ossian contained no allusions to Christianity, and described a mode of life natural to the Highlanders; that they were entirely different from the old English and Scotch ballads; and that it was difficult to suppose that Macpherson could have composed so much poetry in so short a time, and still more improbable that he could have composed it in Gaelic, a language with which he was not very familiar. (He actually published in Gaelic the seventh song of Temora.) It was also suggested that had he been the real author, he would not have been ready to transfer the honour to another, and that their long preservation might be accounted for by the attachment of the Highlanders to their heroic period, and by the existence of bardic schools among them. In 1797, the Highland society of Edinburgh appointed a committee to examine the subject, the Report of which, by Mackenzie was published in 1805. In this it appeared that traditions of the Ossianic heroes had been preserved in Ireland, and that several manuscripts existed containing ancient ballads. These traditions and ballads, which had formed the subjects of the bardic songs as late as the first part of the eighteenth century, formed, according to the Report, the groundwork of Macpherson's Ossianic poems; he had translated them freely, connected them arbitrarily, and made such changes, additions, and improvements as he had thought proper. The longer epic poems, Fingal and Temora, were by no means to be conceived to have existed in their present form; the epic dress is altogether foreign from the originals, which were short poetical descriptions. The general subject of this whole series of ballads is the deliverance of Erin from the haughty Swaran, king of Lochlin, by Fingal. Whatever was the origin of the poems, they were admired by all the nations of Europe, and translated into all the European languages. In 1807, the Highland society published the Gaelic originals of fourteen Ossianic poems, with a literal Latin translation by Macfarlane (*Dana Oisien*; new ed. Edinburgh, 1818, 3 vols). "The last incident in their story," says Mackintosh, "is perhaps the most remarkable. In an Italian version (by Cesarotti), which softened their defects, and rendered their characteristic qualities faint, they formed almost the whole poetical library of Napoleon, a man who must be owned to be, by the transcendent vigour of his powers, entitled to a place in the first class of human minds. No other imposture in literary history approaches them in the splendour of their course."—The subjects of the Ossianic poems are partly narrative and partly lyric—heroic deeds of war, vivid pictures of Highland nature, the praise of better times past, complaints of wounded feeling, &c. Their form is quite peculiar; the language concise and abrupt; in the original it is metrical. They please by their successful delineation of the passions, picturesque expressions, bold, but lovely images and comparisons, their deep pathos, their tenderness and melancholy tone. On the other hand, it has been objected to them, that they are defective in the discrimination of character, and in variety of imagery.

OSSUNNA, DON PEDRO Y TELLEZ GIRON, duke of, celebrated for his government of Naples and Sicily, was born at Valladolid, in 1579. His grandfather, viceroy of Naples, took him, when two years old, to

Italy. At the age of ten, he returned to Spain, and was educated at Salamanca. His satirical wit made him many enemies at the court of Philip II., and he was banished from the capital on account of a disrespectful answer to the king. After the death of Philip, he returned, attached himself to the duke of Lerma, the favourite minister of Philip III., and took the title of *duke of Ossunna*. The courtiers, however, again found means to procure his banishment, and he served six campaigns in Flanders. In this interval he visited England and France, and was received with many marks of favour by Henry IV. and James I., the former of whom was delighted by his wit, and the latter with his learned conversation in Latin. In 1607, the duke of Lerma procured permission for him to return, and Ossunna exercised his influence in effecting the acknowledgment of the independence of the United Netherlands by the treaty of 1609. His opposition to the expulsion of the Moors (q. v.) from Spain, exposed him to the persecutions of the inquisition, which, however, was unable to fix any charge upon him. The viceroyalty of Sicily was soon after conferred on him, and he remained there till 1615. The restoration of public security, the repression of the violences of the nobles, the encouragement of commerce and agriculture, and the deliverance of the coasts from the ravages of the Turks, prove the vigour and wisdom of his administration. In 1616, he was appointed viceroy of Naples. He resisted with success the claims of Venice to the exclusive navigation of the Adriatic. Philip, at the instigation of the papal nuncio, having formed the design of introducing the inquisition into Naples, Ossunna refused to obey his orders to this effect, and his enemies were busy in their efforts to bring him into disgrace with the court. To avoid the storm which now threatened him, he married his daughter to the son of Lerma. His opposition to the establishment of the inquisition had, however, excited the animosity of the clergy, who were very powerful in Naples; and, as he foresaw that the intrigues of the court would sooner or later strip him of his power, he formed the bold plan of raising himself to the sovereignty of the country. In prosecution of this design, he sounded the dispositions of Savoy, Venice, and France, in 1617, and formed connexions with Holland and the Porte. (See Daru's *Histoire de Venise*.) A part of his plan became known; a capuchin denounced the viceroy in Madrid, and he was recalled in 1619, but returned in a sort of triumph. On the accession of Philip IV., however, he was arrested, and proceedings were commenced against him. They continued three years, but nothing was proved against him; and he died in the castle of Almeda, in 1624, full of witty sallies to the last. See Leti's *Life of the Duke of Ossunna* (Paris, 1700).

OST, the German for *east*, appearing, of course, in a number of geographical names.

OSTADE, ADRIAN VAN, a painter of the Flemish school, was born at Lubeck, in 1610, and studied under Francis Hals. His pictures are characterized by an exact imitation of nature, and his admirable representations of subjects, which in other hands would only have been disgusting. They usually consist of the interiors of alehouses or kitchens, with Dutch peasants smoking, quarrelling, or drinking; but he throws such expression into the heads of his characters, that their vulgarity is lost in our admiration of their truth and animation. His colouring is rich and clear, his touch spirited and free, and all his works are highly finished. On the approach of the French troops, in 1662, to Haarlem, Ostade sold all his pictures and effects, in order to return to Lubeck; but at Amsterdam he was prevailed upon to remain, and he practised his profession with great reputation until his death, in 1685.

Isaac van Ostade, his brother and scholar, was born at Lubeck, about 1612. His earliest pictures, which he painted in imitation of his brother, were greatly inferior; but he afterwards adopted a style of his own, in which he was successful; and he was often solicited by contemporary landscape painters to add his figures to their pieces. He died young.

OSTEND; a fortified and well built place in the Belgic province of West Flanders, with 10,500 inhabitants, and a harbour on the North sea, into which the largest ships can enter only at flood tide; lat. 51° 13′ N.; lon. 2° 55′ E.; sixty-six miles west of Brussels. It communicates by canals with Bruges and Ghent on the east, and with Nieuport on the west. Regular post-office packets convey the mail twice a week from Dover to Ostend, and from Ostend to Dover. Ostend is celebrated in history for the siege (1601—1604) which it sustained against the whole Spanish power for three years. It finally capitulated on honourable terms. See *Netherlands*, and *Belgium*.

OSTEOLITE (from the *Greek*); a petrifaction of a bone. See *Geology*, and *Organic Remains*.

OSTEOLOGY. See *Anatomy*, and *Bones*.

OSTIA; at the mouth of the Tiber, whence Rome received her supplies of all commodities by sea, celebrated in the poem of Virgil, and the traditions which represent Æneas as having landed there. Sixtus IV. and Julius II. surrounded it with fortifications. It has also a bishop's palace, with a church. During summer, on account of the *malaria*, it has but ten inhabitants, and in winter not above a hundred. The ancient Ostia, now only known by its ruins, is near the modern. Formerly, when it had 30,000 inhabitants, it formed a semicircle round the river, which makes a bend there. Ostia was never a seaport, but an unfortified anchorage ground, in which, from the time of Ancus Martius to the latest period of the republic, the Roman fleet lay moored. This made it possible for pirates to pillage the fleet in the midst of Ostia, which Cicero, in his speech for the Manilian law, so bitterly condemns. At a later period, this anchorage became so obstructed, that, even in the time of Strabo, only light vessels could go up the stream. Just before Ostia the Tiber divides into two branches; the right branch, on account of its straighter direction, appears to fill up less. Claudius and Trajan therefore built a port on the right arm of the Tiber, to supply the city more safely: this is now called *Porto*, and its prosperity caused the decline of the once important Ostia. As early as A. D. 420, Rutilius Numantianus describes Ostia as inaccessible, and Procopius (*De Bello Goth.* 1st vol., p. 26) speaks of it as in his time (the middle of the sixth century) entirely destroyed. With its decay it is probable the *malaria* increased; and the neighbouring salt-works, founded by Ancus Martius, and now scarcely discoverable, aqueducts, as also an adjoining marsh, were also pernicious. The invasion of the Saracens, who disturbed the peace of the few remaining inhabitants, caused the fortifying of the present Ostia. A celebrated picture, by Raphael, commemorates the naval battle between the Neapolitans and the Saracens.

OSTRACION is the name adopted by Linnæus for a genus of fish, which appear as if they were invested in a coat of mail; for, instead of scales, they have regular bony compartments, forming a kind of cuirass that covers the body and head, so that all the movable parts are the tail, the fins, the mouth, and a small projection at the gills. The greatest number of their vertebræ are likewise inflexible.

Their jaws are each armed with ten or a dozen conical teeth. They have but little flesh, but their liver is large, and furnishes a great quantity of oil. This genus is not well understood by naturalists, and requires close study; all the species of it are inhabitants of warm countries, and differ exceedingly in form and size. Most of them are armed with spines.

OSTRACISM; a judgment of the assembly of the people in Athens, which checked the influence of powerful citizens by an exile of ten years. If any person was regarded as obnoxious, every citizen who was of this opinion wrote the name of the person to be banished on a shell (ὄστρακον), which he deposited in the place appointed in the forum. This place was enclosed by wooden balustrades, and had ten gates, at which the ten tribes of Athens entered at the assemblies of the people. The archons counted the shells deposited by the citizens, and if at least 6000 were in favour of the banishment of the accused, the banishment took effect; otherwise, he was acquitted. Persons were exiled by the ostracism for ten years, and, after the expiration of this period, the exiled citizen was at liberty to return to his country, and take possession of his wealth, and all his civil privileges. To this sentence no disgrace was attached; for it was never inflicted upon criminals, but only upon those who had excited the jealousy or suspicion of their fellow-citizens, by the influence which they had gained by peculiar merit, wealth, or other causes. Aristotle and Plutarch called the ostracism the *medicine of the state.* Still it was often used by bad and envious men to accomplish their unlawful designs, and to destroy the influence of patriotic citizens.

OSTRICH (*struthio*). No bird is, perhaps, more celebrated than the ostrich, not only from the beauty and value of its plumage, but also from its great size and peculiar habits. It is generically distinguished by its straight and depressed bill, and the shortness of its wings, which are unfitted for flight. The African or true ostrich (*S. camelus*) is from seven to nine feet high from the top of its head to the ground; most of this, however, is made up by the great length of its neck. Its head is small, and both it and the neck are destitute of feathers, having only a few scattered hairs. The feathers on the body are blackish; those of the wings and tail are white, sometimes marked with black. The wings are furnished with spurs. The thighs are naked, and the legs hard and scaly. The ostrich inhabits the burning and sandy deserts of Africa in large flocks. This bird appears to have been known from the earliest ages: it is constantly alluded to in the Old Testament, and was one of the forbidden articles of food to the Jews. Fashion has set too high a value on the feathers of the ostrich to admit of his remaining undisturbed, even in the desolate regions which he inhabits. Anciently, also, it appears that this bird was sought for to grace the table of the epicure; thus that prince of gourmands, Heliogabalus, caused the brains of 600 of them to be served up at one meal. The hunting of the ostrich is exceedingly laborious, as he is far swifter than the fleetest horse. The mode adopted by the Arabians and Moors is to pursue the bird as long as possible, when the chase is taken up by another on a fresh horse, till the bird is worn down. This is the more readily done, as the ostrich, instead of pursuing a straight course, runs in a circuitous direction. It is also said that they are taken by a hunter covering himself with one of their skins, and then approaching them sufficiently near to surprise them. They are tamed, and are bred in some parts of Africa. The female lays from ten to twelve eggs in a hole in the sand; and, although she does not incubate them continually, no bird has a stronger affection for its offspring, or watches its nest with more assiduity. Contrary to the general opinion, she always broods over her eggs at night, only leaving them during the hottest part of the day. If the eggs be touched by any one during the absence of the birds, they immediately discover it, on their return, by the smell, and not only desist from laying any more in that place, but likewise destroy all that may have been deposited. Barrow states that in the interior of the eggs there are frequently found small, oval-shaped pebbles, of a pale yellow colour, and exceedingly hard. The eggs are said to be a great delicacy, and prepared for the table in various ways. The ostrich, in a tame state, swallows, with the greatest voracity, rags, leather, iron, or stone. Doctor Shaw says, "I saw one at Oran that swallowed, without any seeming uneasiness or inconvenience, several leaden bullets, as they were thrown upon the floor, scorching hot from the mould."

The American ostrich (*S. rhea*) is very closely allied to the preceding, and may be considered its representative in the western continent. This bird inhabits various parts of South America to the southward of the equator, but is principally found on the great plains in Buenos Ayres and the adjoining states. It is not as large as the African ostrich, and is of a uniform gray colour, except on the back, which has a brown tint. The back and rump are furnished with long feathers, which are not as rich and full as those of the true ostrich, and are but little esteemed as articles of dress or ornament, being principally used for brushes for driving away flies, or cleaning articles from dust. This bird possesses the same remarkable speed as the former species, and its running is accompanied with a singular motion of its wings. It raises one, which it holds for some time stretched out, then depresses it, and erects the other. It is taken by chasing it on horseback, and catching it with the lasso, or by means of balls connected by a strip of hide, and thrown in such a way as to entangle its legs. It discovers the same indiscriminate voracity as the ostrich, and the size of the articles it can swallow is astonishing: one that was in Philadelphia a few years ago could swallow a whole onion, the diameter of which was apparently larger than that of its own neck. The distension produced by this root, as it descended to the stomach, could be readily traced. The natural food of this bird is fruit, grain, and, in fact, most vegetable substances. The individual just alluded to fed eagerly on grass or clover.

OSTROG; an affix of several Russian geographical names, signifying *strong*.

OSTROGOTHS. See *Goths*.

OSTROLENKA; a village in Poland, thirty-one leagues north-east from Plock, with 1850 inhabitants. This place is celebrated for a battle between the French and the Russians, February 25, 1806, and a battle between the Poles, under general Skrzynecki, and the Russians, under marshal Diebitsch, May 26, 1831. This engagement was very sanguinary, and the Poles were at length obliged to retreat.

OSTROV (*Russian*) signifies *island;* for instance, *Lissie-Ostrova* (Fox Islands).

OSTRYA. See *Iron-Wood.*

OSWEGATCHIE; a township of St Lawrence county, New York, on the St Lawrence river. The principal village is the post-borough Ogdensburgh, which stands on the St Lawrence, directly north of the mouth of Oswegatchie river. It is the capital of the county, and contains the county buildings. It is also a port of entry and delivery, and has a custom-house. Ogdensburgh has considerable commerce and manufactures. Its distance from Albany is 209 miles; and it stands opposite Prescot and Fort Wellington, in Canada. Population of Oswegatchie, 3934.

OSYMANDYAS; one of the Pharaohs of ancient Egypt, who flourished about 1500 years B. C. He erected the gigantic works of Thebes, built the Memnonium in the city of the hundred gates, and, according to Diodorus, inscribed on his colossus, "I am Osymandyas, king of kings: if any man will know my greatness and my resting-place, let him destroy one of my works." Heeren (*Historical Works*, xiv. 241 seq., and 317 seq.) conjectures that Osymandyas was a name of the great Rameses, or Sesostris, as all the works of art in the Memnonium relate to traditions of the exploits of this great sovereign. (See *Memnon*.) According to some writers, Osymandyas belonged to the fifteenth dynasty, and lived about 2300 years B. C. According to the explanation by the Cav. St Quentin, member of the Turin academy, of the hieroglyphics on the pedestal of a colossus made of hard red sand-stone, which is in the museum of Egyptian antiquities at Turin (taken by Drovetti, in 1818, from the ruins of the ancient temple of Carnac), that statue, the largest, and perhaps, also, one of the most beautiful which have been brought uninjured from the banks of the Nile to the continent of Europe, is the statue of king Osymandyas.

OTAHEITE. See *Society Islands*.

OTFRID, or OTFRIED; the author of one of the earliest specimens of composition in the German language. He was a native of Suabia, and lived in the middle of the ninth century. After having become a monk of the abbey of Weissenburg, in Alsace, he studied under Rabanus Maurus, abbot of Fulda. He then returned to his monastery, where he opened a school of literature, and wrote a variety of works in prose and verse. The most important of these is a rhymed version, or paraphrase, of the gospels, in old High German, still extant, in which there are some passages of lyrical poetry. Schers published it, with a Latin translation, in his edition of Schilter's *Thesaurus Antiquitatum Teutonicarum*.

OTHMAN. See *Caliph*.

OTHO, MARCUS SALVIUS, successor of the emperor Galba, was descended from a consular family, and passed his youth in luxury and debauch, being the confidant of Nero. This emperor appointed him proconsul in Lusitania, that he might remove an obstacle to the gratification of his passion for Poppæa Sabina, the wife of Otho, to whose beauty her husband himself had first called his attention. Otho held his place with honour for ten years. He was the first to declare for Galba, when he rebelled against Nero, and accompanied him to Rome, where he was made consul immediately after Galba ascended the throne, A. D. 67. As Galba did not adopt him for his successor, and as he was greatly distressed, having squandered away all his fortune, he determined to effect the fall of the emperor. He succeeded, with the assistance of the pretorian bands and the other troops. Galba was murdered, and Otho proclaimed emperor. But the legions in Germany proclaimed Vitellius. In vain did Otho offer immense sums to gain them to his side. Vitellius refused the offer to reign as joint emperor, and led his army over the Alps. Otho, for whom most of the provinces had declared, sent against these veteran troops an army of newly-levied soldiers, but commanded by able generals, who defeated, in three battles, the divided army of Vitellius. Elated by his success, and becoming imprudent, Otho determined on a decisive battle against the now united troops of his adversary, and was beaten. Upon receiving information of his misfortune, he resolved, by a voluntary death, to end the civil war, and pierced himself with his dagger, after reigning three months and three days. Notwithstanding his luxurious habits, he had given proofs of a daring and resolute spirit, so as to be deemed worthy of a better fate.

OTHO I., emperor of Germany, son of Henry I., was born in 912. His haughtiness and selfish spirit excited the enmity of his brothers, and even his mother was so much disgusted at them, as to employ all her influence against him in favour of her second son, Henry. Otho's firmness, however, prevailed, and he was crowned king of Germany, at Aix-la-Chapelle, in 936. Wenceslaus, on whom he had conferred the duchy of Bohemia, having been murdered by his brother, the latter, on Otho's refusal to acknowledge his claim to the succession, determined to make Bohemia independent of Germany, and was not reduced until 950, after a fourteen years' war. Otho also brought to a successful issue the struggles with the dukes of Bavaria and Franconia, and invested his son Ludolf (949) with the duchy of Suabia, and his brother Henry with that of Bavaria. Conrad, count of Worms, married Otho's daughter, and received Lorraine. Otho likewise gained reputation in his dealings with foreign states. The Danes, who had invaded Germany, were driven back beyond the Eider, the Danish king was obliged to embrace Christianity, and acknowledge himself a vassal of the empire. Louis (Outremer) called in his aid against the great vassals under the powerful Hugh the Great. Otho reduced the rebels to terms, and confirmed the authority of the king. The Italians next required his assistance to deliver them from the oppressions of Berengarius II. Otho defeated the usurper, married the widow of the last king, and was crowned king of Lombardy, at Pavia, in 951. This marriage not only engaged him in ambitious attempts for the possession of Italy, but attracted many foreigners to his court, and involved him in family dissensions. His son Ludolf, and his son-in-law Conrad, duke of Lorraine, revolted, but were worsted, and deprived of their duchies, in 954, which were placed under Bruno, archbishop of Cologne, brother of Otho. Hardly were these transactions completed, when the Hungarians broke into Germany, but were defeated by Otho on the Lechfeld, near Augsburg (August 10, 955), with such slaughter, that they never ventured to renew their invasions. Otho next turned his arms against Berengarius, who had revolted. He was crowned king of Italy by the archbishop of Milan (961), and, soon after (962), emperor, by the pope John XII. The pope took the oath of allegiance to him, and the clergy promised that, for the future, the choice of pope should always be made in the presence of an imperial commissioner. John soon repented of having given himself a master, and flew to arms while the emperor was yet in Pavia. The latter hastened to Rome, deposed that pontiff, and placed Leo VIII. in the papal chair. No sooner was Otho returned to Germany, than the Romans restored John, and reversed the measures of the emperor, who again appeared in Rome, and punished his enemies. The Byzantine court refused to acknowledge Otho's claim to the imperial dignity; but he defeated the Greek forces in Lower Italy, and the Eastern emperor, John Zimisces, gave the Greek princess Theophania to his son in marriage. Otho died in 973, leaving the reputation of great courage and the strictest integrity. The clergy in Germany were indebted to him for their elevation, which he encouraged to counterbalance the power of the temporal vassals.

OTHO II., youngest son of Otho I. and the fair Adelaide, was born in 955. His elder brothers had all died before their father, who caused him to be crowned king of Rome—the first instance of the kind in German history. He inherited from his father a hasty and unsteady temper, which, while it led him to form great projects, also pushed him forward too impatiently to their execution. Adelaide at first held the reins of government. Otho, disgusted at his state of dependence, left the court, and a civil war broke out, at the head of which was his cousin Henry, the young duke of Bavaria. Otho completely humbled him, and granted the duchy to his nephew Otho of Suabia (978), who thus became the possessor of two great fiefs. He afterwards became involved in a war with Lothaire, king of France, for Lorraine. Lothaire attacked him in Aix-la-Chapelle, in 978, and Otho was obliged to retreat, but, having collected his forces, drove back Lothaire, laid waste Champaigne, and advanced towards Paris, the suburbs of which he burned. By the terms of the peace which was concluded in 980, Lorraine was left in its former relations to the empire. Otho next attempted to drive the Greeks from Italy; but they called in the Saracens to their aid, from Sicily (981), and Otho suffered a total defeat at Basentello, in Calabria. He himself escaped only by leaping into the sea, where he was picked up by a Greek ship that was sailing by. From this he afterwards made his escape by artifice; but he died soon after, at Rome, in 983. His son *Otho III.*, who succeeded him, was born in 980, and died in 1002. With him the male line of the imperial Saxon house became extinct.

OTIS, James, a distinguished American patriot, was born February 5, 1724—5, at Great Marshes, in what is now called West Barnstable (Mass.) His family was one of the most respectable in the colony, and of English origin. In June, 1739, he entered Cambridge college. The first two years of his collegiate course are said to have been given more to amusement than to study, his natural disposition being vivacious and ardent; but subsequently he was distinguished for his application and proficiency. After finishing his course at the university, he devoted eighteen months to the pursuit of various branches of literature, and then entered upon the study of the law, in 1745, in the office of Mr Gridley. Under that eminent lawyer he employed his legal novitiate, and then went to Plymouth, where he was first admitted to the bar. The two years, however, of his residence in that town, were more occupied in study than in practice, so that, when he removed to Boston, in 1750, he was well qualified to assume a high rank in his profession. This he quickly did: his practice became very extensive. On one occasion, he went, in the middle of winter, to Halifax, in consequence of urgent solicitation, to defend three men accused of piracy, and procured their acquittal. Although his professional engagements were so numerous, he cultivated his taste for literature, and, in 1760, published a treatise, entitled the Rudiments of Latin Prosody, with a Dissertation on Letters and the Principles of Harmony, in poetic and prosaic composition, collected from the best Writers. He also composed a similar work on Greek prosody, which remained in manuscript, and perished with all his papers. It was never printed, as he said, because "there were no Greek types in the country, or if there were, no printer knew how to set them." In 1755, he married Miss Ruth Cunningham, the daughter of a respectable merchant, who brought him a dowry at that time considered very large. Amid all the embarrassments which his affairs subsequently experienced, in consequence of his entire devotion to the concerns of the public, he sacredly preserved the fortune which he received with his wife, to whom it returned after his death. The public career of Mr Otis dates from the period when he made his famous speech against the "writs of assistance," for which an application had been made, by the officers of the customs, to the superior court of Massachusetts, in pursuance of an order in council, sent from England, to enable them to carry into effect the acts of parliament regulating the trade of the colonies. When that order arrived, Otis was advocate-general, and was, consequently, requested to lend his professional assistance in the matter; but, deeming the writs to be illegal and tyrannical, he refused, and resigned his station. He was then applied to, to argue against the writs, which he immediately undertook to do, in conjunction with Mr Thacher, and in opposition to his former preceptor, Mr Gridley, the attorney-general. Of the discourse which he pronounced, president Adams the elder says, "Otis was a flame of fire: with a promptitude of classical allusions, a depth of research, a rapid summary of historical events and dates, a profusion of legal authorities, a prophetic glance of his eyes into futurity, and a rapid torrent of impetuous eloquence, he hurried away all before him. American independence was then and there born. Every man, of an immense crowded audience, appeared to me to go away as I did, ready to take arms against writs of assistance." The court adjourned for consideration, and, at the close of the term, the chief-justice, Hutchinson, delivered the opinion; "The court has considered the subject of writs of assistance, and can see no foundation for such a writ; but, as the practice in England is not known, it has been thought best to continue the question to the next term, that, in the mean time, opportunity may be given to know the result." When the next term came, however, nothing was said about the writs; and though it was generally understood that they were clandestinely granted by the court, and that the custom-house officers had them in their pockets, yet it is said that they were never produced or executed. Otis had now fully committed himself against the designs of the British ministry, and thenceforward bent all his energies to maintain the freedom of his country. At the next election of members of the legislature, in May, 1761, he was chosen, almost unanimously, a representative from Boston, and soon became the leader, in the house, of the popular party. For the detail of his course, during the period in which he was a representative, we must refer our readers to the biography of him by Mr Tudor. In 1765, Mr Otis was chosen, by the Massachusetts legislature, one of the members of a committee appointed to meet the committees of the legislatures of other colonies at New York, in consequence of the passing of the stamp-act by parliament. They met in convention October 19, in the same year, and named three committees to prepare addresses to the king, lords, and commons. On the last Mr Otis was placed. In this convention, Mr Otis made the acquaintance of many distinguished men, from different colonies, and subsequently maintained, with several of them, a friendship and correspondence. In May, 1767, after the repeal of the stamp-act, Mr Otis was elected speaker of the house of representatives; but he was negatived by the governor, who entertained a peculiar animosity towards him, from his indefatigable endeavours to defeat every plan of encroachment. In the summer of 1769, the vehement temper of Mr Otis was so much wrought upon by the calumnies which he discovered that the commissioners of the customs in Boston had transmitted to England concerning him, by which, indeed, they sought to have him tried for treason, that he inserted an advertisement in the Boston Gazette, denouncing them in severe terms. The next evening he happened to go to the British coffee-house, where one of the commissioners, a Mr Robinson, was sitting with a number of officers of the army, navy, and revenue. As soon as he entered, an altercation arose, which was quickly terminated by a blow from Robinson's cane. Otis immediately returned it with a weapon of the same kind, when the lights were extinguished, and he was obliged to defend himself, single-handed, against numbers. After some time, the combatants were separated. Robinson retreated by a back passage, and Otis was led home, wounded and bleeding. He received a deep cut on his head; and to this has been partly attributed the derangement under which he afterwards laboured. Soon after this transaction, he instituted an action against Robinson, and obtained an award of £2000 sterling damages, which, however, he gave up on receiving a written apology, in which the defendant acknowledged his fault, and begged his pardon. In 1770, he retired into the country on account of his health. At the election in 1771, he was again chosen a representative; but this was the last year that he took a part in public concerns, except occasionally to appear at a town-meeting. He withdrew also, almost entirely, from the practice of his profession. His mind became seriously affected, and continued so, with some lucid intervals, until his death. Sometimes he was in a frenzied state; at others, he exhibited rather the eccentricity of a humourist than absolute derangement. The two last years of his life were passed at Andover. After he had been there for some time, he was supposed to be completely restored, and returned to Boston. He resumed his professional engagements, and pleaded a cause in the court of common pleas, in which he displayed considerable power, but less than was his wont. The interval of reason was not, however, of long duration, and he was induced to go back to Andover. Six weeks after his return, he was killed by a stroke of lightning, in the sixtieth year of his age, May 23, 1783.

OTTAR OF ROSES; an aromatic oil, obtained from the flowers of the rose, but in such small quantities that half an ounce can hardly be procured from a hundred pounds of the petals. This oil is solid and white at the common temperature of the atmosphere, but, on the application of heat, becomes fluid, and assumes a yellow colour. It is brought in considerable quantities from Turkey, and is sold at the extravagant price of from three to five pounds an ounce. That from the East Indies, where it is said to be chiefly manufactured, when genuine, has been sold at a much more exorbitant price. It is frequently adulterated with oil of sandal wood; but the fraud is easily detected by those who are accustomed to its scent, and also by the fluidity. The true ottar of roses is, undoubtedly, the most elegant perfume known.

OTTER (*lutra*, Storr). This animal somewhat resembles the weasels, with which it was classed by Linnæus, but differs from them by living almost constantly in the water, on which it almost solely depends for subsistence. It is distinguished by having eighteen teeth in each jaw, of which twelve are false molars. The feet are palmated, and the tail flattened horizontally. They are excellent swimmers, and feed almost entirely on fish. The common otter (*L. communis*) inhabits all parts of Europe, dwelling on the banks of rivers, in burrows, forming the entrance of its hole under water, and working upwards, making a small orifice for the admission of air in the midst of some thick bush. It is about two feet in length to the insertion of the tail, which is sixteen inches long. It is brown above and whitish around the lips, on the cheeks, and beneath. The otter can be domesticated, though, from its ferocious disposition, this is a task of much difficulty. When properly trained, they become very useful, one of these animals being able to supply a large family with fish. When the otter, in its wild state, has taken a fish, it carries it on shore, and devours the head and upper parts, rejecting the remainder. It is destructive, killing more than it can eat. The female produces four or five young in the spring of the year. It fights very obstinately when hunted, often inflicting severe wounds on the dogs. Its flesh is so fishy that the Romish church permitted the use of it on *maigre* days.

American otter (*L. Brasiliensis*). This species inhabits the whole American continent, but is rare in the Atlantic coast of the United States; in Canada, however, they are very numerous, 17,500 skins having been sent to England in one year, by the Hudson's bay company. Its habits are the same as that of the European species; both have a habit peculiar to these animals: this is sliding, or climbing to the top of a ridge of snow in winter, or a sloping moist bank in summer, where, lying on the belly, with the fore legs bent backwards, they give themselves an impulse with their hind legs, that enables them to glide swiftly down the eminence. This sport they continue for a long time. The American otter is about five feet in length, including the tail, which is eighteen inches. The colour of the whole body, except the chin and throat, which are a dusky white, is a glossy brown. The fur is much esteemed, and is very dense and fine. The common mode of taking them is by sinking a steel trap near the mouth of their burrow.

Sea otter (*L. lutris*). This species is much larger than the two last, being about the size of a large mastiff, and weighing from seventy to eighty pounds. Its colour, when in full season, is perfectly black; at other times of a dark brown. The fur is very fine, and sells at very high prices in China, to which the skins are usually taken. It is exclusively found between the 49th and 60th degrees north latitude, on the north-western coasts of North America, and the shores of Kamtschatka and the adjoining islands. It is always seen on the coast or in the immediate vicinity of salt water. It feeds on almost all kinds of fish and crustaceous animals. It runs very swiftly and swims with extreme celerity, either on its back, sides, or sometimes as if upright in the water. It is caught by placing a net among the sea-weed, or by chasing it in boats. The flesh of the young is said to be very tender, resembling lamb in flavour. The female brings forth but one at a birth, and is extremely careful and sedulous in her attention to her offspring, playing with it and fondling it in various ways, and never relinquishing it as long as she can defend it. The young continues with the dam till it is old enough to seek a mate, to whom it continues constant.

OTTOMAN EMPIRE, TURKISH EMPIRE, OTTOMAN or SUBLIME PORTE. The finest countries of the old world—Thrace, Greece, Asia Minor, Colchis, Armenia, Mesopotamia, Syria, and Egypt, together with the islands of the Archipelago, and spicy Arabia, whose commerce connects Asia and Africa with Europe, and unites the East with the West—have been ruled for five hundred years by the Turks, or Ottomans, a mixed people, composed of Tartars, robbers, slaves, and kidnapped Christian children. They are the only barbarians who have reduced civilized nations to their yoke without mingling with them, without adopting their language, their religion, their sciences, their arts, and their manners. This nation, originally a horde of robbers, become powerful by conquest, have remained strangers in the midst of Europe, and for four centuries have profaned with Asiatic despotism the classic soil of Athens, Sparta, Corinth, and Thebes, upon which, 2500 years ago, was maintained the independency of Europe, where flourished civil freedom and the refinement of polished life. We can here but briefly relate how it happened that a band of robbers from the steppes of Northern Asia should have pitched their camps in the country of Homer, of Solon, and of Pericles; and how this stronghold of despotism, erected by Asia in Europe, has yet refrained from adopting European policy.

It is only since the middle of the sixth century that history mentions the name of *Turks*. This tribe of Scythian Tartars was then settled on the banks of the Irtisch, at the foot of the Altai mountains, in the steppes of Northern Asia, on the confines of China and Persia, now inhabited by the Kirghises, Bucharians, Usbecs, and Turcomans. They carried on war with the Sassanides and Byzantine emperors, sometimes in alliance with one, sometimes with the other. About the middle of the eighth century, the eastern territories of the Turks became subject to China, and the western to Persia, which the Saracens had conquered. They now embraced Mohammedanism, and the caliph of Bagdad soon formed of them his body-guard. These military slaves successively supplied to the Saracens generals, to the caliphs *emirs al Omrah* (first ministers, like the Frankish *maires du palais*), and finally sovereign rulers. Thus the Turkish families of the Tulunides and Akshidides reigned in Palestine, Syria, and Egypt, during the ninth and tenth centuries, and that of the Gasnevides in Persia and India from the end of the tenth to the end of the twelfth century. At the same time, a Turkish tribe in Turkestan—the ancient seat of the Scythian Massagetæ, now that of the Tartars, upon the Jaxartes (Sir) and Oxus (Jihon), between lake Aral and the Caspian—threw off the Chinese yoke, and, under the name of *Seljooks* (from their leader), subdued, in the eleventh century, all Western Asia, where the warlike Togrul Beg, the grandson of Seljook, Alp Arslan, and Malek Shah founded a powerful empire, with which the crusaders contended for the possession of Palestine. In 1100, this was divided into three parts—Persia, Media, Chorasan, and the country beyond the Oxus—and there arose, during the twelfth and thirteenth centuries, the Mongols, a race differing entirely from the Tartars, to whom the Turks belong, in language and in manners. In connexion with other hordes, they destroyed the power of the Seljooks in Asia Minor; and several less powerful Mongol communities arose. But the leaders (emirs) of the Seljooks and Turcomans, who had been driven from their settlements by the Mongols, soon sallied forth from the valleys of mount Taurus, and divided Asia Minor among themselves. One of these emirs was Osman (i. e. *bone-breaker*), of the race of the Oguzian Turcomans. With his horde of some hundred Tartar families from the Caucasus, he forced (1239) the passes of Olympus, where about 800 Turcoman families still remain, and pitched his camp in the plain of Bithynia, under the protection of the Seljook sultan of Iconium. Reinforced by robbers, runaway slaves, and prisoners, he plundered the surrounding country, and took several provinces of Asia Minor from the Eastern empire of the Romans. After the death of his protector, in the year 1300 (700 of the Hegira,) he proclaimed himself sultan. He died in 1326.

Thus a bold and successful captain of a band of robbers, unobstructed by the weak and divided Byzantines, founded upon the ruins of the Saracen, Seljook, and Mongol power the empire of the Osman or Ottoman Turks in Asia; and, after him, the courage, policy, and enterprise of eight great princes, whom the dignity of caliph placed in possession of the standard of the prophet, and who were animated by religious fanaticism and a passion for military glory, raised it to the rank of the first military power in Europe (1300—1566.) The first of them was Orchan, son of Osman. In the year 1328, he fixed his residence in Bursa, capital of Bithynia, which he had conquered shortly before his father's death.—Concerning this bloody cradle of the Ottoman power, and the monuments of Osman and his successors to Amurath II., which are to be found there, see Von Hammer's *Journey from Constantinople to Brussa* (Bursa), *and to the Olympus* (Pest, 1818). He organized a valiant infantry, which he kept in constant pay, formed, in part, of Christian slaves brought up in the Mohammedan faith and the practice of arms. He subdued all Asia Minor to the Hellespont, and took the name of *Padishah*. The gate of his palace, of which the proud ruins are still to be seen, was called the *Porte*. He became son-in-law to the Greek emperor Cantacuzenus. This circumstance, and an alliance with the Genoese, who, from rivalry with the commerce of the Venetians, so powerful in the Levant, alternately courted the emperors of Constantinople and the powerful sultan of the Asiatic coast, and lent their ships to the Turks for transportation, made known to Orchan and his successors the weakness of the Eastern empire and the divisions of the Western, where religious schisms and the feudal system had destroyed all civil order, and where there was no authority or policy to hold together the whole. Asia no longer feared a crusade. More wise and intelligent than the padishahs of the eighteenth and nineteenth centuries, Orchan and his successors resolved to reduce feeble and divided Europe under the law of the prophet. Split into numerous governments, it invited them, as Asia Minor had formerly done, to victory and plunder.

Orchan's son, the brave Soliman, first invaded Europe in 1355. He fortified Gallipoli and Sestos, and thereby held possession of the straits which separate the two continents. The Ottoman armies now spread at the same time over Europe and Asia. In 1360, Orchan's second son and successor, Amurath I., took Adrianople, which became the seat of the empire in Europe, and conquered Macedonia, Albania, and Servia with his janizaries, composed of the children of Christians educated in the Mohammedan faith, together with the Timariots and Zaims, who, as vassals, were obliged to perform cavalry service. While yet elated with his victory upon the field of Caschau, the Servian Milosch Kobilowitsch, who had fought in vain for the freedom of his country, and lay severely wounded upon the ground, called him towards him, and, collecting his strength, plunged his dagger into his heart (1389). After him, the ferocious Bajazet, surnamed the *Lightning*, invaded Thessaly, and advanced to Constantinople. September 28, 1396, he defeated the Western Christians under Sigismund, king of Bohemia and Hungary, at Nicopolis, in Bulgaria, and slew 10,000 Christian prisoners; built a strong castle on the Bosphorus, and imposed a tribute upon the Greek emperor; but the arms of the Mongol Timur (see *Tamerlane*) called him back to Asia; and in the battle of Ancyra, in 1402, where more than a million warriors contested the empire of the world, the proud Bajazet was conquered and taken prisoner. Timur divided the provinces between the sons of Bajazet. Finally, in 1413, the fourth son of Bajazet, the wise and just Mohammed I., seated himself upon the undivided throne of Osman. In 1415, while the fathers of the council of Constance were burning John Huss and deposing three popes, to restore peace to the church, his victorious troops reached Salzburg, and invaded Bavaria. He conquered the Venetians at Thessalonica, in 1420; and his celebrated grand-vizier Ibrahim created a Turkish navy. He was succeeded by his son, the wise and valiant Amurath II. The brave George Castriot in Epirus (Scanderbeg, i. e. prince Alexander), the heroic John Hunniades, prince of Transylvania, and the fortress of Belgrade, the bulwark of the West, alone resisted him. After the conclusion of peace in 1440, he laid down the reins of government; but, the pope having absolved Ladislaus, king of Hungary and Poland, from his oath, and the Christians having penetrated to the borders of the Black sea, Amurath again girded on the sword of Osman, called down the vengeance of Heaven upon his perjured enemies, and conquered the Christians at Varna, in 1444. Ladislaus and Julian, the legate of the pope, were among the slain. The great Amurath again abdicated the throne, and was again recalled to it by danger. He humbled the pride of the janizaries, and conquered the Christians at Caschau, in 1449.

The Byzantine empire was already cut off from the West, when Mohammed II., the son of Amurath, and his successor, at the age of twenty-six, completed the work of conquest (1451—1481). The reading of ancient historians had inspired him with the ambition of equalling Alexander. He soon attacked Constantinople, which was taken May 29, 1453; and the last Paleologus, Constantine XI., buried himself under the ruins of his throne. Since that time, Stambul has been the residence of the Sublime Porte. Mohammed now built the castle of the Dardanelles, and organized the government of the empire, taking for his model Nushirvan's organization of the Persian empire. In 1456, he subdued the Morea, and, in 1461, led the last Comnenus, emperor of Trebizond, prisoner to Constantinople. Pius II. called in vain upon the nations of Christendom to take up arms. Mohammed conquered the remainder of Bosnia in 1470, and Epirus in 1465, after the death of Scanderbeg. He took Negropont and Lemnos from the Venetians, Caffa from the Genoese, and, in 1473, obliged the khan of the Crim Tartars, of the family of Gengis-Khan, to do him homage. In 1480, he had already conquered Otranto, in the kingdom of Naples, when he died, in the midst of his great projects against Rome and Persia. His grandson Selim I., who had dethroned and murdered his father, drove back the Persian power to the Euphrates and the Tigris. He defeated the Mamelukes, and conquered, in 1517, Egypt, Syria, and Palestine. Mecca submitted to him, and Arabia trembled.

During fifty years, the arms of the Ottomans, by sea and by land, were the terror of Europe and of Asia, especially under Soliman II. the Magnificent, also called the *Lawgiver*, who reigned between 1519 and 1566. In 1522, he took Rhodes from the knights of St John, and, by the victory of Mohacz, in 1526, subdued half of Hungary. He exacted a tribute from Moldavia, and was successful against the Persians in Asia, so as to make Bagdad, Mesopotamia, and Georgia subject to him. He was already threatening to overrun Germany, and to plant the standard of Mohammed in the West, when he was checked before the walls of Vienna (1529). But since Hungary, out of hate against Austria, had placed its king John Zapolya under the powerful protection of the padishah, and the successful corsair Barbarossa was master of the Mediterranean, had conquered Northern Africa (see *Barbary*), and laid waste Minorca, Sicily, Apulia, and Corfu, the sultan Soliman might have conquered Europe, had he known how to give firmness and consistency to his plans. The projects of the conqueror were rendered abortive by the policy of Charles V. He was resisted at sea by the Venetians, and the Genoese Andrew Doria, by the grand-master Lavalette in Malta, and by Zriny, under the walls of Zigeth.

Twelve sultans, all of them brave and warlike, and most of them continually victorious, had now, during a period of two centuries and a half, raised the power of the Crescent; but the internal strength of the state was yet undeveloped. Soliman, indeed, by his laws, completed the organization begun by Mohammed II., and, in 1538, united the priestly dignity of the caliphate to the Ottoman Porte; but he could not incorporate into a whole the conquered nations. He also imprisoned his successor in the seraglio—an education as little adapted to produce heroes as statesmen. From this time, the race of Osman degenerated, and the power of the Porte declined. From Soliman's death, in 1566, to our time, eighteen sultans have reigned, and among them all, there have not been two brave warriors, nor a single victorious prince. These sovereigns ascended the throne from a prison, and lived in the seraglio until, as not unfrequently happened, they again exchanged the throne for a prison. Several grand-viziers, such as Kiuprili, Ibrahim, and the unfortunate Mustapha Bairactar, alone upheld the falling state, while the nation continued to sink deeper into the grossest ignorance and slavery. Pachas, more rapacious and more arbitrary than the sultan and his divan, ruled in the provinces. In its foreign relations, the Porte was the sport of European politicians, and more than once was embroiled by the cabinet of Versailles in a war with Austria and Russia. While all Europe was making rapid progress in the arts of peace and of war, the Ottoman nation and government remained inactive and stationary. Blindly attached to their doctrines of absolute fate, and elated by their former military glory, the Turks looked upon foreigners with contempt, as infidels (*giaours*). Without any settled plan, but incited by a savage hatred and a thirst for conquest, they carried on the war with Persia, Venice, Hungary, and Poland. The revolts of the janizaries and of the governors became dangerous. The suspicions of the despot were quieted with the dagger and the bowstring, and the ablest men of the divan were sacrificed to the hatred of the soldiery and of the ulema. The successor to the throne commonly put to death all his brothers; and the people looked with indifference upon the murder of a hated sultan, or the deposition of a weak one.

Mustapha I. was twice dethroned (1618 and 1623); Osman II. and Ibrahim were strangled, the former in 1622, the latter in 1648. Selim II., indeed, conquered Cyprus in 1571, but, in the same year, don John of Austria defeated the Turkish fleet at Lepanto. A century after, under Mohammed IV., in 1669, Candia was taken, after a resistance of thirteen years; and the vizier Kara Mustapha gave to the Hungarians, who had been oppressed by Austria, their general, count Tekeli, for a king, in 1682; but, the very next year, he was driven back from Vienna, which he had besieged, and, after the defeat at Mohacz, in 1687, the Ottomans lost most of the strong places in Hungary. The exasperated people threw their sultan into prison. In a short time, the grand-vizier, Kiuprili Mustapha, restored order and courage, and recalled victory to the Turkish banners; but he was slain in the battle against the Germans near Salankemen in 1691. At last, the sultan Mustapha II. himself took the field; but he was opposed by the hero Eugene, the conqueror at Zentha in 1697, and, on the Don, Peter the Great conquered Azoph. He was obliged, therefore, by the treaty of Carlowitz, in 1699, to renounce his claims upon Transylvania and the country between the Danube and the Theiss, to give up the Morea to the Venetians, to restore Podolia and the Ukraine to Poland, and to leave Azoph to the Russians. Thus began the fall of the Ottoman power. A revolt of the janizaries, who, abandoning their ancient rigid discipline, wished to carry on commerce, and live in houses, obliged the sultan to abdicate. His successor, the imbecile and voluptuous Achmet III., saw with indifference the troubles in Hungary, the war of the Spanish succession, and the great Northern war. Charles XII., whom he protected after his defeat at Pultawa, finally succeeded in involving him in a war with Peter; but the czar, although surrounded with his whole army, easily obtained the peace of the Pruth, by the surrender of Azoph in 1711. In 1715, the grand-vizier attacked Venice, and took the Morea; but Austria assisted the republic, and Eugene's victories at Peterwardein and Belgrade (1717) obliged the Porte to give up, by the treaty of Passarowitz, in 1718, Temeswar, Belgrade, with a part of Servia and Walachia: it still retained the Morea. Equally unsuccessful were Achmet's arms in Persia: in consequence of which an insurrection broke out, and he was thrown into prison in 1730. In 1736, the Russian general Munich humbled the pride of the Ottomans; but Austria, the ally of Russia, was not successful, and the French ambassador in Constantinople effected the treaty of Belgrade (in 1739), by which the Porte regained Belgrade, with Servia and Walachia.

After a peace of thirty years, Mustapha III. became conscious of the rising greatness of Russia, and required Catharine II. to withdraw her troops from Poland; but the victories of Romanzoff, in the war between 1768 and 1774, determined the political superiority of Russia. At the same time, a Russian fleet was victorious on the Grecian seas, and Alexis Orloff called the Greeks to freedom—an unsuccessful attempt, indeed; yet Abdul-Hamid, at the peace of Kutschuk-Kainargi, in 1774, was obliged to renounce his sovereignty over the Crimea, to yield to Russia the country between the Bog and the Dnieper, with Kinburn and Azoph, and to open his seas to the Russian merchant ships. But the pride of the humbled Porte was aroused by the rapacious spirit of Russia, and the divan, in 1787, declared war against Catharine II. The war, however, was carried on during the reign of Selim III. with so little success, that Russia, by the peace of Jassy (1792) retained Taurida and the country between the Bog and the Dniester, together with Otchakoff, and gained some accessions on the Caucasus. Austria, also, to which the Porte, in 1777, had ceded the Bukowina, a part of Moldavia, had declared war in favour of Russia, but was induced, by the threats of Prussia, to restore Belgrade at the peace of Sistora in 1791.

At this time, the internal confusions of the Turkish empire were continually increasing. Selim III. was not deficient in understanding or in knowledge, but he had not energy to effect a thorough reform. How could he, with his divan, change the anti-European spirit of the Turks, restrain the pretorian pride of the janizaries, change the form of government, and the system of laws consecrated by the Islam, and protected by the ulema, reform the Oriental manners of the court and the whole constitution of the state? There was no other connexion between his wide extended realms than faith in the caliphate of the padishah, and fear of the power of the grand seignior. The former was shaken by the sect of the Wahabees (Wechabites—not reduced till 1818), and the latter thrown off by several bold governors of the provinces. Among these petty sultans were Passwan Oglou in Widdin (Viddin), Jussuff (until 1810) in Bagdad, several pachas in Anatolia, &c., Ali, pacha of Janina, and Ali Bey, in Egypt. (See *Mohammed Ali*.) The Servians wished for a native hospodar; thence arose continual insurrections, and continual acts of tyranny. The people continued plunged in ignorance, and sometimes committed acts of Asiatic barbarity. On the other hand, a spirit of freedom manifested itself in Greece, by impotent efforts, but in Servia by a vigorous resistance between 1801 and 1814. Finally, in March, 1821, the Greek nation arose to shake off the Turkish yoke.

Turkey was equally perplexed in her foreign relations. She had been mistrustful of France ever since the alliance of that country with Maria Theresa in 1756. She remained a quiet spectator of the outbreak of the revolution, and the grand-vizier had hoped that the republic would not unite with Austria. The divan, however, observed conscientiously the existing treaties, and neither in Asia nor in Europe took advantage of the favourable opportunities for restoring the ancient power of the Ottomans by a war against Persia or against Austria. At the same time, Russia stood ready upon the heights of Caucasus and at the mouths of the Danube. Bonaparte's campaign in Egypt finally raised the indignation of the Porte, which, September 1, 1798, declared war for the first time against France. By its alliance with Russia, in December, 1798, and with England and Naples, in January, 1799, it now fell under the direction of the cabinets of Petersburg and St James. A Russian fleet sailed through the Dardanelles, and a Turkish squadron, in co-operation with it, conquered the Ionian islands. Paul I. and Selim III., by a treaty at Constantinople (March, 21, 1800), formed the republic of the Seven Islands, which as well as Ragusa, was to be under the protection of the Porte. In the following year, England restored Egypt to the Porte; but the Mameluke beys and the Arnaouts filled the land with tumult and bloodshed, until, on the 1st of March, 1811, the new governor, Mehemed Ali Pacha, entirely exterminated the Mamelukes by treachery. Since then, he has ruled Egypt almost independently. The union with the European powers had, however, made Selim and some of the chiefs of the empire sensible that, if the Porte would maintain its power, it must introduce into its armies the modern tactics, and give to the divan a form more suited to the times. The Nizam Dshedid laboured, therefore, to form a Turkish army on the European model, which should supersede the janizaries. But, after the peace with France, in 1801, there were in the divan two parties, a Russian and British, and a French. The superiority of Russia pressed upon the Porte in the Ionian islands and in Servia; it was therefore inclined to favour France. When, therefore, Russia, in 1806, occupied Moldavia and Walachia, the old hostility broke out anew, and, December 30, 1806, the Porte, at the instigation of France, declared war against Russia, which was already engaged with Persia and France. The weakness of the Ottoman empire was now evident. A British fleet forced the passage of the Dardanelles, and February 20, 1807, appeared before Constantinople; but the French general Sebastiani directed, with success, the resistance of the divan and of the enraged people. On the other hand, the Russians made rapid advances. The people murmured. Selim III., May 29, 1807, was deposed by the mufti, and Mustapha IV. was obliged to put a stop to the hated innovations. But, after the Turkish fleet had been entirely beaten by the Russians at Lemnos, July 1, 1807, Selim's friend, Mustapha Bairaktar, the brave pacha of Ruschuk, took advantage of the terror of the capital to seize it. The unhappy Selim lost his life July 28, 1808; and Bairaktar, in the place of the deposed Mustapha IV., raised to the throne the present sultan, Mahmoud II. (born in 1785.) As grand-vizier of Mahmoud, he restored the new military system, and concluded a truce with Russia; but the fury of the janizaries again broke out, and destroyed him and his work, November 16, 1808.

Mahmoud alone now supported the throne; for he was since the death of Mustapha IV., the only prince of the family of Osman. He soon showed extraordinary courage and prudence. He concluded peace with Great Britain Jan. 5, 1809, and continued with redoubled vigour, the war against the Russians, who already threatened the passages of the Balkan. Twice (1810 and 1811) the Russians were obliged to retreat beyond the Danube; nevertheless, their policy conquered the French party in the divan. In vain had the French emperor, in his treaty with Austria, March 14, 1812, declared that he would maintain the integrity of the Turkish territory. Notwithstanding this, before the French army had passed the Niemen, the sultan bought peace with Russia, May, 28, 1812, at Bucharest, by ceding that part of Moldavia and Bessarabia, which lies beyond the Pruth, with the northern fortresses on the Dniester and at the mouths of the Danube, and the southern gates of the Caucasus on the Kur. The Servians, left to themselves, again became subjected to Turkey. They retained, however, by their treaty with the Porte in November, 1815, the administration of the government. In 1817, Mahmoud was obliged to give up the principal mouth of the Danube to Russia. But the Greek insurrection again disturbed the relations of the two powers, and has produced important changes in the situation of the Porte. (See *Greece*, *Revolution of*, and *Mahmoud II.*) The Porte believed that Russia secretly favoured the insurrection, and therefore seized Moldavia and Walachia, and restricted its maritime commerce. Both were open violations of the peace of Bucharest. After an interchange of notes, the Russian ambassador left Constantinople. The mediation of the British and Austrian courts, together with the emperor Alexander's desire for peace, prevented the outbreak of a war; but the divan, under various pretexts, refused all satisfaction to the Russian cabinet, until, at last, the emperor Nicholas declared the Russian *ultimatum*, upon which the Porte, May, 14, 1826, granted all the demands of the Russian court, and promised that in Moldavia and Walachia (where, in three years, it had raised 37,000,000 of piastres, which were employed in the war against the Greeks) every thing should be replaced on its former footing, and sent commissioners to Ackerman. Here a final term was again fixed for the decision of the divan, and, Oct. 6, 1826, eighty-two articles of the Russian *ultimatum* were accepted. This treaty of Ackerman carries into effect the peace of Bucharest. The Porte surrendered to Russia the fortresses in Asia which it had hitherto held back, and acknowledged the privileges granted by Russia, to Servia, Moldavia and Walachia. The treaty was executed in 1827.

In the mean while, the Porte had begun its internal reform, and it was resolved utterly to exterminate the janizaries, who had lately burnt the suburb of Galata, from the 3d to the 5th of January, 1826. An army was formed upon the European system, and in June, 1826, the body of janizaries was destroyed after a bloody struggle. The violence employed in the execution of this and other measures, caused an insurrection, in which (August 31 and October 11) 6000 houses were burnt in Constantinople. Instead of military insubordination, the most rigid military despotism began, which did not spare even the ulema. At the same time the Porte, in June, 1827, firmly refused the offered mediation of Russia, Britain, and France, in its war with the Greeks, and the grand seignior called all his subjects (Christians included) to arms, to fight, if necessary, against all Europe. After the fall of the Acropolis (June 5, 1827,) Reschid Pacha came into possession of Livadia. East and West Hellas again submitted to the Crescent. The relations of Turkey and Greece, and those arising therefrom between the former and the great powers of Europe, have been treated of in the article *Greece*. The war between Turkey and Russsia, which began in 1828, and was terminated by the peace of Adrianople, Sept. 14, 1829, will be described in the article *Russia*. It remains only to mention here, that, though the sultan seemed, for a time, determined to infuse into his military and civil establishment as much as possible of western civilization, and though he seemed for a time successful—wore himself the European dress, and prohibited, throughout the empire, the calling of Christians "dogs" yet, according to the latest accounts, he has been obliged to give up all attempts of this kind; and the late desolating fires at Constantinople prove the sentiment with which the Turkish rabble regarded the improvements. For the geography of the Ottoman empire, see *Turkey;* for the janizaries, see *Janizaries*.

OTUS. See *Aloides*.

OTWAY, THOMAS, an English writer of tragedy, was born in 1651, at Trotting, in Sussex, his father being the rector of Woolbeding, in that county. He was educated at Winchester, and was entered a commoner of Christ-church, Oxford, which he left without a degree, or any professional determination, went to London, and made some attempts as an actor, but with little success. In 1675, he produced his first tragedy of Alcibiades. The following year appeared his Don Carlos, which proved extremely successful. His theatrical reputation introduced him to the patronage of the earl of Plymouth, a natural son of Charles II., who procured him a cornetcy in a regiment of cavalry, destined for Flanders, in which country he served for a short time, and then returned, pursued by his habitual poverty. He continued to write for the stage, but found it a very scanty means of subsistence. He produced, in 1677, Titus and Berenice, from Racine, and the Cheats of Scapin, from Molière, which were acted together as play and farce, and succeeded. The following year he produced his Friendship in Fashion, a comedy, which was followed, in 1680, by his tragedies of Caius Marius and the Orphan; and, in 1682, by Venice Preserved, on which last two pieces his dramatic fame is chiefly founded. His comedies were coarse and licentious, even for that day. He died in 1685, in his 34th year, at a public house on Tower Hill, where he had secreted himself from his creditors, in a state of great destitution. It is a traditionary story that, being nearly famished, he begged a shilling of a gentleman, who gave him a guinea, and that he was choked by eagerly devouring a roll, which he purchased to allay his hunger. Pope was, however, informed, that he fell a sacrifice to a fever, occasioned by his anxious pursuit of a person who had shot a friend of the name of Blakeston. All accounts agree that he closed his life in great penury. The unhappy fate of Otway has excited great sympathy, associated as his memory is with some of the most tender and pathetic scenes in English tragedy; but his dissoluteness of life and manners, and shameless flattery of the great, much tended to abate this kindly feeling. As a tragic writer he stands high, and no one has touched scenes of domestic distress with more force and feeling. His language is easy and natural, and the sentiments and incidents moving. The miscellaneous poetry of Otway is indifferent. The latest edition of his works is that by Thornton, in 3 vols. 8vo. (1812.)

OUDE (*Dutch*) signifies *old*; e. g., *Oudenaerde*, Old Land.

OUDE; one of the provinces of Hindoostan, in the northern part of the country, lying between Agra and Delhi on the west, and Bahar and Nepaul on the east, with Allahabad on the south; lat. 26° 56′ to 28° 41′ N.; lon. 81° E. Its length is about 200 miles, and its breadth about 100, with a population of 3,700,000. The Ganges, the Gogra, and the Goomty water the rich plain which forms this province. The climate is mild, as the Nepaul mountains protect it from the cold winds of the north. Oude furnishes, in abundance, all the vegetable wealth of India—rice, wheat, and other grain, sugar-canes, indigo, opium—and is connected, by the Ganges, with the bay of Bengal. Oude is a British dependency; the nominal sovereign (styled vizier of the Mogul empire and nabob of Oude) resides at Lucknow. The rajepoots, or military caste, serve in the British army under the name of *seapoys* (*sipahis*).

OUDENARDE, or AUDENARDE; a town of Belgium, in East Flanders, capital of a district on the Scheldt, supposed by some to have been built by the Goths, about the year 411; twelve miles S. of Ghent; twenty-four N. E. Lille; population, 5084; houses, 950. It is unfortified, but well built, and has manufactures of woollens and linens. It has sustained several sieges, but is best known in history by the memorable victory gained over the French, on the 11th of July, 1708, by prince Eugene and the duke of Marlborough. The French loss was 15,000; that of the allies, 5000.

OUDNEY. See *Clapperton*.

OUEN, St; a small village about five miles N. of Paris, with 1550 inhabitants. It has become celebrated in history by the declaration issued here by Louis XVIII., May 2, 1814, promising to maintain constitutional principles. The manufactures of Ternaux have also given it celebrity. In 1351, when king John founded the order of the star, he assigned to it, as its place of assembly, the chateau at St Ouen, called *Noble Maison*, whence the knights were often called *chevaliers de Noble Maison*. St Ouen is adorned with numerous country seats.

OUISCONSIN, or WISCONSIN; a river of the North-West Territory (q. v.).

OUNCE. See *Jaguar*.

OURANG-OUTANG. See *Ape*.

OURCQ, Canal de l', runs from the river of the same name, and is chiefly intended to supply Paris with water, and to feed the canals of St Denis and St Martin. Its navigation is of little importance. It supplies the reservoir La Villette, to the N. E. of the city, from which the water is conducted into the city by pipes. The expense was 24,000,000 francs.

OUTFLANKING. See *Flank*.

OUTLAWRY is the putting one out of the protection of the law. Anciently, in Britain, an outlawed felon was said to have *caput lupinum* (a wolf's head), and might be knocked on the head like a wolf, by any one that should meet him; for having himself renounced or evaded the law, he was to lose its protection, and be dealt with as in a state of nature, where every one that should find him might slay him. But the inhumanity of the law, in this respect, had become softened as early as the times of Bracton; and now, no man is entitled to kill him wantonly, and in so doing he is guilty of murder. A defendant is outlawed, in Britain, upon certain proceedings being had, when he does not appear to answer to an indictment or process. In an indictment for treason or felony, an outlawry of the party indicted is equivalent to a conviction. Any one may arrest a person outlawed on such an indictment, either of his own motion, or upon a warrant, called a *capias utlagatum*, for the purpose of bringing him to execution. In other cases, the effect of outlawry is the forfeiture of the goods of the outlaw to the king, in whom they become vested for the benefit of the plaintiff, in the suit in which the outlawry is had. Another consequence of outlawry is, that the outlaw cannot bring any suit or process in his own name; he is, in this respect, deprived of the benefit of the law, and is, consequently, stripped of all his civil rights. The object of these severe penalties is, to compel persons sued in civil process, or indicted, to appear and answer, instead of absconding and leaving the kingdom. The law is careful that so heavy penalties should not be incurred without sufficient grounds, and the most exact and formal proceedings. It is, accordingly, provided by *Magna Charta*, that none shall be outlawed otherwise than according to the laws of the land. The ordinary proceeding for this purpose is, to issue three writs successively, to arrest the defendant. If he is not to be found, the coroner is ordered, by writ, to exact or demand him, in five county courts successively, and the sheriff is ordered to make proclamation three times, in the most public places in the county of his residence, calling upon him to appear and answer to the suit or indictment. If he does not thereupon appear, a judgment of outlawry is passed. If, however, there is any, the least, defect in the proceedings, this judgment may be reversed on error. No process of outlawry is known to be in use in any of the United States of America. If a criminal escapes from the country, the government authorizes its officers to make application to the authority of the country to which he flees, to surrender him, that he may be brought back and put upon his trial. When a person, answerable in a civil suit upon a contract, leaves the country, the party to whom he is answerable may, in most cases, follow him to the foreign country, to enforce the contract against him there.

OUTLINE, in drawing, is the representation of an imaginary line circumscribing the boundary of the visible superficies of objects, without indicating, by shade or light, the elevations and depressions, and without colour. Only one indication of light and shade is used in outlines—the greater lightness or darkness of the lines,—and a skilful artist can produce much effect with these scanty means. The study of contour, or outline, is of the greatest importance to the painter; it is to him what the fundamental bass is to the musician. In recent times, great attention has been paid to outline, and many engravings have been published, representing only the outlines of celebrated works of art, or original compositions, in outlines, by celebrated artists, such as Cornelius. In painting, the outlines may be sharp, as in the ancient German school, or more soft and less defined, as in the Italian school.

OUT OF TRIM; the state of a ship when she is not properly balanced for the purposes of navigation, which may be occasioned by a defect in the rigging, or in the stowage of the hold.

OUTRIGGER; a strong beam of timber, of which there are several, fixed on the side of a ship, and projecting from it, in order to secure the masts in the act of careening, by counteracting the strain they suffer from the effort of the careening tackles, which, being applied to the mast-head, draw it downwards, so as to act upon the vessel with the power of a lever, whose fulcrum is in her centre of gravity.

Outrigger is also a small boom, occasionally used in the tops, to give additional security to the topmast.

OUTWORKS are all works of a fortress which are situated without the principal wall, within or beyond the principal ditch. They are designed to obstruct the attack upon the principal wall, to intercept the shot against the same, and to afford a lateral defence. All outworks must, therefore, be so constructed, 1. that the enemy must attack them before he can reach the principal wall; 2. that they give lateral defence to the principal wall; 3. that they completely cover all parts of the principal wall from the enemy's batteries erected beyond the glacis; 4. that they shall be conspicuous from the principal wall. For the most part, though not always, they are some feet lower than the principal wall. The most common outworks are, 1. the *tenaille*, which lies in the ditch, between two bastions, before the curtain, and has usually the form of a re-entering angle; 2. the *ravelin*; by it are sometimes placed, 3. *lunettes*; 4. *counterguards* (*couvrefaces*) serve as a protection to the faces of the bastion, sometimes in the form of a saliant angle before the bastion. Beyond the principal ditch, yet united with it by their ditches, are situated (to strengthen important points), 5. *horn works*, which consist of two demi-bastions joined with a curtain, and these, again, are attached to the fortress by two wings, i. e. walls with moats; 6. *crown-works*, where a whole and two demi-bastions are employed, instead of two half bastions only; 7. *tenailles*, consisting of a re-entering angle, which is appended to the fortress by wings. If there are two neighbouring re-entering angles, then the work is called, 8. a *double-tenaille*; if the two wings are not parallel, but converging or diverging, then they are called, 9. *swallow's tails*, and, 10. *bonnet à prêtre*, &c. In the places of arms, of the covered way, as in almost all other out-works, there are frequently constructed works of various forms, which are called, 11. *redoubts*. On the glacis, or near its foot, frequently stand, 12. *flèches*, or, 13. *lunettes*, which have a shape resembling the bastion, and are not to be confounded with No. 3; 14. *detached works*; they become, 15. *forts*, or *detached forts*, when they are distant 500 paces, and more, from the glacis, are larger and more substantial, and, for the most part, fortified also behind.

OVARY (diminutive of *ovum*, an egg). The ovaria are two flat oval bodies, about one inch in length, and rather more than half in breadth and thickness, suspended in the broad ligaments, about the distance of one inch from the uterus behind, and a little below the Fallopian tubes. They include a number of vesicles or ova, to the amount of twelve to twenty, of different sizes, joined to the internal surface of the ovaria by cellular threads or pedicles, and contain a fluid which has the appearance of thin lymph. The ovaria prepare whatever the female supplies towards the formation of the fœtus: this is proved by the operation of spaying, which consists in the extirpation of the ovaria, after which the animal not only loses the power of conceiving, but desire is for ever extinguished. These vesicles have been generally regarded as little eggs, which detach themselves from the ovary after fecundation, and are carried into the cavity of the womb by the Fallopian tubes.

OVATION. See *Triumph*.

OVERBURY, SIR THOMAS, principally known by the tragic circumstances of his death, was descended from an ancient family in Gloucestershire. He was born in 1581, in Warwickshire, and, in 1595, was entered a fellow-commoner of Queen's college, Oxford. After taking a degree, he removed to the Middle Temple, for the study of the law; but his inclination being more turned to polite literature, he preferred the chance of pushing his fortune at court. In 1604, he contracted an acquaintance with Robert Car, the worthless favourite of James I. The ignorance and mean qualifications of this minion rendered the services of a man of parts and education, like Overbury, exceedingly welcome, and he repaid his services by procuring for him, in 1608, the honour of knighthood, and the place of a Welsh judge for his father. The intimacy continued to be mutually advantageous, until the favourite engaged in his amour with the countess of Essex. Sir Thomas countenanced this gallantry in the first instance; but when that infamous woman had, by a series of disgraceful proceedings (but too much countenanced by the king himself), procured a divorce from her husband, he opposed the projected marriage between her and her gallant, by the strongest remonstrances. This counsel Car (then become viscount Rochester) communicated to the lady, who immediately exercised her influence for the removal of her adversary. An attempt was made to place him at a distance, by appointing him to a foreign mission; but, relying upon his ascendency with the favourite, which he exercised with considerable arrogance, he refused to accept it. On the ground of disobedience in declining the king's service, he was immediately arrested, and committed a close prisoner to the Tower, in April, 1613, and all access of his friends was debarred. At length, fear of his resentment and disclosures, if released, induced Car and the countess (now become his wife) to cause infected viands to be administered, at various times, to the unhappy prisoner, who finally fell a sacrifice to a poisoned clyster, September 15, 1613. All these facts afterwards appeared in evidence, when the accomplices in the murder were tried, and Sir Gervase Elways, the lieutenant of the Tower, a creature of Car's, with several others, were condemned and executed. Car and his lady (then become earl and countess of Somerset) were also convicted and condemned, but, to the disgrace of James, pardoned for no assignable cause that will not add to the ignominy of the proceeding. Sir Thomas Overbury wrote both in verse and in prose, and his poem, entitled the Wife, has been much admired.

OVERT; the same with *open*. Thus an *overt act* signifies an act which, in law, must be clearly proved, and such as is to be alleged in every indictment for high treason.

OVERTURE, in music; an introductory symphony, chiefly used to precede great musical compositions, as oratorios and operas, and intended to prepare the hearer for the following composition. But the Germans have even composed overtures for poetical works, as Beethoven's overture to Goethe's Egmont. Overtures are often played independently of the work for which they were written, as at the beginning of concerts; but their highest office is to convey to the intelligent lover of music the whole character of the following piece, or to concentrate its chief musical ideas, so as to give a sort of outline of it in instrumental music. The latter mode of composing overtures was first conceived by the French, and such is the character of the overtures of their great composers, particularly Cherubini. Carle Maria von Weber, in the overtures to the Freischutz and Oberon, has observed this rule, which did not exist when Mozart composed his admirable overtures to Figaro and Don Juan, in which the general character of the following piece is given. In the eldest overtures the fugue was the chief part, preceded by a *grave* in $\frac{4}{4}$ time, not too much prolonged, and closing in the dominante. The *grave* was often repeated after the fugue. Most of the overtures of Handel's oratorios have this form. Another form came into vogue at a later period—three musical parts, in different movements—an *allegro*, an *andante*, and again an *allegro*, or *presto*, were united. At present, the most usual form is a brilliant and passionate *allegro*, preceded by a short, solemn passage. Gluck, in his overture to *Iphigenia in Aulis*, was the first who used this form.

OVIDIUS, Publius, surnamed *Naso*, one of the most celebrated Roman poets of the Augustan age, was of an equestrian family, born at Sulmo, in the country of the Pelignians, B. C. 43. Though inferior to some of his contemporaries in purity and finish of style, he is surpassed by none of them in graceful elegance and versatility, although sometimes disfigured by prolixity, a straining after antitheses, and a forced pleasantry. But he is very happy in exhibiting the minute and peculiar traits of passion. Many of his tales are uncommonly lively and pleasing; for example, Pyramus and Thisbe, Dædalus and Icarus, Philemon and Baucis. Ovid says himself, in the tenth elegy of the fourth book, in which he describes his feelings and his life, that he was born a poet. In spite of the exhortations of his father, who wished to make him a lawyer, he had been inclined from childhood to the service of the Muses. His travels in Greece and Asia added to his accomplishments. His fondness for ease and the enjoyments of life, which his fortune placed within his power, prevented him from spending much time in perfecting his verses. His poetry has much of a sensual character, but is distinguished for the choice of the subjects, and for beauty of description. His most celebrated work, a poetic picture of mythology, is the Metamorphoses, written in hexameters—an extraordinary work, if we regard it as a whole, as it unquestionably was the design of the author that it should be. Connected by a band which we are often in danger of losing from our sight, we see a beautiful series of different tales drawn from a formless chaos. We see the world, with its harmony and order, and every thing which lives and moves in it, unfolded, through the mythological and ancient times, down to the days of Julius Cesar. Each one of these tales ends with a metamorphosis; but this frequently appears like an episode, while a long series of verses, which have not the least relation to it, contain all that is most beautiful and attractive. Similar to this is another poem of Ovid's, in distichs, in which some tale from mythology, or from the old Roman and Italian history, is given for every remarkable day and festival of the Roman calendar. It is called the *Fasti*, but embraces in six books only the first six months. We have three other poems of his on the subject of love, all written in elegiac measure; the *Amores*, or Roman love songs; the *Ars Amandi* (Art of Love); and the *Remedium Amoris*, or Remedy of Love. They contribute to give us an idea of the corrupt state of morals at that time in the Roman empire. Ovid also attempted, and not without success, a new and peculiar kind of poetry. We have twenty-one pieces called *Heroides*, some of which, however, are considered as spurious. He wrote also elegies, in the proper sense of the word, that is, songs of lamentation (he calls them *Tristia*), and letters (*Epistolæ ex Ponto*), likewise in elegiac verses, and written in a similar train of thought, during his exile. Even in these poems his tone is far from being depressed, although his heart was heavy, and the burden of years was already pressing upon him. The stream of his verses, however, in these productions, is sometimes shallow; yet here and there we find places where his feelings are expressed with truth and liveliness.

Until his fiftieth year Ovid appears to have lived almost solely for poetry and for pleasure, in an easy intimacy with his relations and friends, and was a welcome visitor at the court of Augustus. His works were well adapted to the public taste, and had obtained him much reputation; and he might have hoped to pass the remaining years of his life in peace under the shadow of his laurels. But Augustus suddenly banished him to Tomos, on the inhospitable coasts of the Black sea, the habitation of the rude Getæ. He declares, in more than one place, that an error, and not a crime, was the cause of his exile. He frequently calls his poetry the cause of all his unhappiness. His licentious verses were certainly not the cause of his punishment, but he hints that he had seen something, and thus drawn upon himself the anger of Augustus. Many think that this had reference to the shameful licentiousness of Julia, the infamous daughter of the emperor. Ovid died at Tomos, after ten years of exile, at the age of sixty, A. D. 18. Among the poems which he left, there is a piece, in elegiac verses, called the *Ibis*, full of abuse and maledictions against some unknown person. Some other smaller poems are falsely attributed to him. But many really authentic pieces have been lost; among others, his tragedy Medea. Among the best editions of the entire works of Ovid, and of some particular poems, is that of Nicholas Heinsius (Amsterdam, 1658—61, 3 vols., 12mo), improved, and accompanied with notes by Burmann (1727, Amsterdam, 4 vols., 4to). From this, with the notes of Heinsius, and an excellent verbal index, Fischer published a new edition (Leipsic, 1758 and 1773, 4 vols.) Mitscherlich published an edition of the complete works from the text of Burmann (Gottingen, 1796—98, 2 vols.) The latest is that of Baumgarten Crusius (1825.) Of the Metamorphoses Gierig has given a good edition, with an excellent Latin commentary (Leipsic, 1804—7; new edition, Leipsic, 1821—23, 2 vols.); and likewise of the *Fasti* (Leipsic, 1812—14.) Of the elegies and epistles an edition with notes has been published by Harles (Erlangen, 1772) and Oberlin (Strasburg, 1778.) De St Ange (died in 1811) made a good translation of Ovid's works into French verse (new edition, Paris, 1824. 11 vols.)

OVIPAROUS. See *Egg*.

OWEN, John, D. D., an English nonconformist divine, was born at Stadham, in Oxfordshire, in 1616, of which place his father was vicar. He studied at Oxford, and remained at college until his 21st year. On the breaking out of the civil war, he took part with the parliament, became a tutor in the family of Sir Robert Dormer, and chaplain to lord Lovelace, but subsequently repaired to London, where he wrote his Display of Arminianism, which was published in 1642. He had hitherto been a Presbyterian in matters of church government, but now adopted the Congregational or Independent mode, as more conformable to the New Testament, and published his reasons. During the siege of Colchester, he became acquainted with general Fairfax, and, having acquired great celebrity, was appointed to preach at Whitehall, the day after the execution of Charles I. He was soon after introduced to Cromwell, whom he accompanied in his expeditions both to Ireland and Scotland, and, in 1651, was made dean of Christchurch college, Oxford, and, in 1652, was nominated by Cromwell, then chancellor of the university, his vice-chancellor. On the death of the protector, he was deprived both of that and his deanery, by the influence of the Presbyterian party. At the meeting of his brethren at the Savoy in 1658, he took a great part in drawing up the confession of faith of the Congregational churches. While the bill to revise the conventicle act was pending, he drew up reasons against it, which were laid before the lords. He died in 1683, in the 63d year of his age. Doctor Owen's works, which are of a high Calvinistic character, amount to seven volumes in folio, twenty in 4to, and thirty in 8vo. In this number are an Exposition on the Epistle to the Hebrews (in 4 vols., folio); a Discourse on the Holy Spirit; a complete Collection of Sermons, and several Tracts (folio); an Inquiry into the original Nature, Institution, &c. of Evangelical Churches (4to); an Account of the Nature of the Protestant Religion, &c.

OWHYHEE. See *Sandwich Islands.*

OWL (*strix*); a nocturnal bird of prey, whose appearance and harsh voice are well known. They are distinguished by having a large head, very large eyes, directed forwards, encircled by a ring of fine feathers covering the base of the beak and the opening of the ear. Their external toe can be turned behind at pleasure. If any analogy is allowable between different tribes of animals, the owls might be said to resemble moths, and to differ from the diurnal birds of prey as these do from butterflies. They are wholly nocturnal (except a few species,) seeking for their prey during the evening or night; and, from the enormous size of the pupils of their eyes, they are enabled to see well in the dark; while, in the day, their sense of sight is imperfect; hence, during this time, they keep concealed in some secure retreat. Their hearing is very acute, and their plumage soft and loose, enabling them to fly without noise, and thus to come on their prey in an unexpected manner. They feed on small birds, mice, bats, and moths, swallowing them entire, and casting up the indigestible parts in the form of small balls. They breed in fissures of rocks, or in holes of trees, the female laying from two to six eggs. They are found in every part of the globe. The genus *strix* of Linnæus has been variously subdivided by modern naturalists. Cuvier admits the following sub-genera: *otus, ulula, strix syrnium, bubo surnia, nyctea, nudipes, scops.*

In North America there are ten or twelve species of these birds, some peculiar to the country, and others common to the two continents. These have been arranged by Bonaparte (see *Annals Lyceum Nat. Hist.*) in the following manner: sub-genus *surnia; S. funerea*, or hawk-owl (*nyctea, scops syrnium, bubo*, Cuv.); blackish-brown, thickly spotted with white, beneath varied with white and brown; tail with narrow white bands, and reaching three inches beyond the wings; feet densely covered with long feathers; bill yellow. This species is very rare: it inhabits the north of both continents. *S. nyctea* (snow-owl); white, more or less spotted, and barred with dusky; tail rounded, reaching but little beyond the wings; feet densely covered with long feathers; bill black; inhabits the north of both continents; not very uncommon. *S. cunicularia* (burrowing owl); cinnamon gray, spotted with whitish; beneath white, spotted with cinnamon brown; tail even, reaching but little beyond the wings; feet covered with short, scattered bristles. This is peculiar to America, is found near the Rocky mountains, and as far south as Paraguay. *S. asio* (mottled or red owl); dark brown; young tawny red, mottled with black, pale brown, and ash-colour; wings spotted with white; beneath white, mottled with black and brown; tail even, reaching to the tip of the wings; feet densely covered with short feathers; inhabits America; common. Sub-genus *ulula* (*otus, ulula, bubo, syrnium*, Cuv.) *S. otus* (long-eared owl); mottled, primaries banded with ferruginous; tufts long; wings reaching beyond the tail; found in both continents; common. *S. brachyotos* (short-eared owl); whitish ferruginous, spotted with dark-brown; tufts short; wings reaching to the tip of the tail; found in both continents; common. *S. nebulosa* (barred owl); pale brown, with transverse, whitish spots; beneath whitish; neck and breast with transverse bars; belly and vent with longitudinal streaks of brown; tail reaching beyond the wings; bill yellow; found in both continents; common. *S. acadica* (little owl); dark-brown, spotted with white; beneath whitish, spotted with reddish-brown; tail short, reaching about to the tip of the wings; very small; inhabits both continents; more common in America. Sub-genus *bubo, S. Virginiana* (great horned owl); mottled; primaries and tail-feathers banded with black and dusky; auricular conch restricted; wings not reaching to the tip of the tail; very large; found in most parts of America. *S. cinerea* (cinereous owl); dark-brown, mottled with whitish; face white, with black, concentric circles; tail reaching beyond the wings; both fasciated; the bands mottled; bill yellowish white; iris yellow; inhabits arctic America, the largest species in that country. Sub-genus *strix. S. flammea* (barn owl); yellowish tawny, with small spots of white; beneath whitish, with blackish points; wings reaching two inches beyond the tail; bill whitish; found in both continents. There are several other species said to exist in America; thus Mr Say indicates *S. bubo* and *phalænoides*, &c.

The *barn owl*, also called *common screech* or *white owl*, is a bird of elegant plumage, in length between thirteen and fourteen inches; stretch of wing three feet. It is very common in Europe, North and South America, in the deserts of Tartary, in Persia, Hindoostan, and even in Australasia, and is met with at the cape of Good Hope. In Europe, it chiefly frequents inhabited districts, and deposits from two to six eggs in a hole of a wall, under the eaves of buildings, in decayed trees, &c., without any formal nest. It usually haunts churches, towers, barns, maltings, farm-houses, &c. In a state of nature, it generally leaves its haunts about twilight, skimming along the ground, exploring the neighbouring woods for prey, and returning before sunrise, making a sort of blowing noise, like the snoring of a man with his mouth open. When it flies or alights, it doles out certain lugubrious notes, which, added to the solemnity of the scene, especially when near churchyards, often inspire awe and apprehension in the minds of the ignorant.

OWLENSPIEGEL. See *Eulenspiegel.*

OX; the general designation for the different species and varieties of the genus *bos.* This is distinguished by having smooth horns, directed sideways, and then curving upwards or forwards in a semi-lunar form. The common ox (*B. taurus*) has a flat forehead, which is longer than it is broad, and round horns placed at the two extremities of a projecting line which separates the front from the occiput: the horns, however, differ so much in their form and direction in the numerous varieties which domestication has produced in this species, that no specific character can be based upon them. The colours of these animals are extremely variable, being reddish, white, gray, brown, black, &c. As with most of the other animals which have been in a state of domestication from the earliest ages, it is difficult to determine from what species they were originally derived: it has been generally supposed that it was the *bos urus*, but Cuvier has shown that this idea is erroneous. To few animals is man more indebted for important services than to the common ox, and none afford him so many articles of food. Throughout a great part of the world, its flesh is the principal article of animal food, while from the milk of the female, of itself an almost indispensable part of our diet, are manufactured cheese, butter, cream, &c. The skins furnish the greatest part of the leather used in the arts. In fact, there is scarcely any part of this valuable animal that is not useful to mankind. The horns are converted into combs, knife-handles, &c.; glue is made from the refuse of the skin, hoofs, &c.; the bones form a cheap substitute for ivory; the blood is employed in the manufacture of prussian blue; the hair is used by plasterers, and the fat in the formation of candles and soap.

The period of gestation of the cow is the same as that of the human species, and she most generally has but one at a birth. The young, like that of the horse, is very perfect and vigorous soon after birth, though it needs the care of the mother for a considerable time. It attains its full vigour at about three years, and the natural term of its life is about fourteen years. The domesticated ox is liable to many diseases, one of which arises from its swallowing the hairs that it licks from its own body. These hairs, being indigestible, remain in the stomach, and at last become united into large solid balls. The varieties produced by domestication and climate are innumerable, and impossible to designate.

B. urus (wild bull; bison of the ancients). This species is distinguished by an arched forehead, wider than it is long; horns attached below the occipital ridge; by the length of its legs; by an additional pair of ribs; by a woolly hair which covers the neck and head of the male, forming a beard under the chin. This animal appears to have formerly been a native of all parts of Europe, but is now only found in the forests of Lithuania, &c. It is exceedingly ferocious and untractable.

One of the most extraordinary species is the *B. grunniens* (grunting ox, horse-tailed ox, or yack). This is a small animal, with a tail resembling that of a horse, and also with a mane on the neck and back. It has a short head, broad nose, and large ears; the horns are short, slender, round, upright, sharp-pointed, and bent inwards. The whole body is covered with long hair, and is entirely black, except the front, ridge of the back, and tail, which are white. There is much dispute about the size, some travellers describing it as smaller than the domestic cow, while others state that it is far larger. From the accounts of Russian naturalists, it appears probable that there are two varieties, differing materially in size. The voice of these animals is very peculiar: instead of lowing, like the other species of this genus, they utter a sound resembling the grunting of a hog. They are susceptible of domestication, but always retain some of their natural ferocity. The wild breed are very dangerous, fighting desperately when attacked. The most valuable part of these animals is their tail. They form the standards designating the rank of superior officers in the Turkish army, and are extensively used in India as brushes to drive away insects: they are also employed by the Chinese to adorn their caps. See *Bison*, *Buffalo*, *Musk Ox*.

OXAHEVRITE; a mineral from the hot spring of Oxhaver, in Iceland. It occurs in thin veins and crystals, which are acute octahedrons, with a square base. It appears to be a variety of apophyllite.

OXALIC ACID. This acid may be obtained from sugar, as follows:—To six ounces of nitric acid, in a stoppered retort, add by degrees one ounce of loaf-sugar in small lumps. A gentle heat may be applied during the solution, and nitric oxide will be evolved in abundance. When the whole of the sugar is dissolved, distil off a part of the acid, till what remains in the retort has a sirupy consistence; and this will, on cooling, form regular crystals, amounting to fifty-eight parts from 100 of sugar. These crystals must be dissolved in water, recrystallized, and dried on blotting paper. Numerous other substances, when treated by distillation with nitric acid, afford the oxalic acid; such as honey, gum Arabic, alcohol, the sweet matter contained in fat of oils, the acid of cherries, the acid of tartar, beech wood, the acids of currants, citrons, raspberries, silk, hair, tendons, wool, also other animal substances, as the coagulum of blood, and whites of eggs. M. Berthollet mentions a difference between animal and vegetable substances thus treated with nitric acid, viz. that the former yielded, besides ammonia, a large quantity of an oil which the nitric acid could not decompose; whereas the oily parts of vegetables were totally destroyed by the action of this acid. He further remarks, that the quantity of oxalic acid, furnished by vegetable matters, thus treated, is proportionable to their nutritive quality, and particularly that from cotton he could not obtain any sensible quantity. Oxalic acid is found in the state of oxalate of lime in the roots and leaves of a great number of plants. It particularly abounds in the leaves of the *oxalis acetosella*, and of the *O. corniculata*. The crustaceous lichens contain nearly one half their weight of oxalate of lime—a substance which is to these plants what carbonate of lime is to corallines, and phosphate of lime to animal bones. Oxalic acid crystallizes in four-sided prisms, the sides of which are alternately broad and narrow, and the summits dihedral. They are efflorescent in dry air, but attract a little humidity if it be damp. They are soluble in one part of hot and two of cold water, and are decomposable by a red heat, leaving a small quantity of a coaly residuum; their acidity is so great, that, when dissolved in 3600 times their weight of water, the solution reddens litmus paper, and is perceptibly acid to the taste. The oxalic acid is a good test for detecting lime, which it separates from all the other acids, unless they are present in excess. It has likewise a greater affinity for lime than for any other of the bases, and forms with it a pulverulent, insoluble salt. With barytes, it forms an insoluble salt, but capable of dissolving in water acidulated with oxalic acid. Oxalate of magnesia, too, is insoluble unless the acid is in excess. The oxalate of potash exists in two states, that of a neutral salt, and that of an acidule. The latter is generally obtained from the juice of the leaves of the sorrel, ten parts of which yield five of juice, which give a little more than one two hundredths of the salt, which requires to be repeatedly crystallized in order to obtain it pure. It unites with barytes, magnesia, soda, and ammonia, and most of the metallic oxides, into triple salts. This salt, besides its use in taking out ink-spots, and as a test of lime, forms, with sugar and water, a pleasant, cooling beverage, and possesses considerable powers as an antiseptic. Oxalic acid acts as a violent poison when swallowed in the quantity of two or three drachms; and several fatal accidents have lately occurred, in consequence of its being improperly sold for Epsom salts. Its vulgar name of *salts*, under which the acid is bought for the purpose of whitening boot-tops, occasions these lamentable mistakes. The immediate rejection from the stomach of this acid by an emetic, aided by copious draughts of warm water containing bicarbonate of potash, or soda, chalk, or carbonate of magnesia, are the remedies.

OXENSTIERN, AXEL, count of; a Swedish statesman, born at Fano, in Upland, in 1583. His own inclinations and the wishes of his family having destined him for the church, he applied himself, at Rostock, Wittenberg, and Jena, principally to theology, for the study of which he always retained a predilection. After finishing his studies, he visited most of the German courts, and in 1602, returned to Sweden. In 1606, Charles IX. sent him on a public mission to Mecklenburgh, and, in 1608, he was admitted into the senate, in which his thirteen immediate ancestors had held a seat. The infirmities of age having induced his sovereign, not long after to appoint a regency, Oxenstiern was placed at the head of it, and on the accession of Gustavus Adolphus, was made chancellor. In 1614, he accompanied the new king to Germany, and soon after had the satisfaction of seeing the hostilities between Sweden and Russia terminated by the honourable peace of Stolbova. He was subsequently appointed governor-general of all the conquests of the Swedish arms in Germany; and when Gustavus penetrated into the heart of that country, Oxenstiern was invested with full powers in all affairs, both civil and military, on the Rhine, and fixed his headquarters at Mentz, while Gustavus advanced into Bavaria and Franconia. On the fall of his master at Lutzen (1632), he exerted himself in every way to protect Sweden and her allies, and visited Dresden and Berlin, to concert measures for continuing the war. The Swedish government conferred on him full powers to adopt any measures which he considered for the public good. He therefore assembled a congress at Heilbronn, in which he was recognised as the head of the Protestant league. This league was held together and supported solely by his influence and wisdom, and, in 1636, he returned to Sweden, after an absence of ten years, laid down his extraordinary powers, and took his seat in the senate, as chancellor of the kingdom, and one of the five guardians of the queen. His great aim was to bring the German war to a successful conclusion; and with this design he sent his son John to Germany, in the capacity of Swedish plenipotentiary. In 1645, he assisted in the negotiations with Denmark at Bromsebro, and, on his return, was created count, by queen Christina, and at the same time was elected chancellor of the university of Upsal. When the queen declared her intention of naming her successor, Oxenstiern opposed that measure with all his influence, and resisted, with still stronger urgency, her determination to abdicate the crown; finding her, however, fixed in her resolution, he pretended sickness, as an excuse for staying away, and taking no part in a step which he foresaw would be the beginning of evil. From that time, he took no pleasure in public affairs, although he continued to serve his country with zeal and ability until his death, in 1654. Oxenstiern must be ranked among the greatest men who have taken a distinguished part in the affairs of the European world. Great and elevated views, a wonderful political sagacity and foresight, firmness and loftiness of purpose, wisdom in contriving and prudence and energy in executing, a strict integrity, and a constant devotion to the welfare of his country, are among the characteristics of this great statesman. The constitution, which was prepared by him, and accepted by the states of Sweden in 1634, is esteemed a political master-piece.

OX-EYE; a small cloud or meteor, seen at the cape of Good Hope, which presages a dreadful storm. It appears at first in the form or size of an ox's eye, but descends with such celerity, that it seems suddenly to overspread the whole hemisphere, and at the same time forces the air with such violence, that ships are sometimes scattered several ways, some directly contrary, and many sunk down right.

OXFORD; a city of England, capital of the county to which it gives name; 45 miles S. E. of Worcester, 58 W. by N. of London, 74 S. W. of Cambridge; lon. 1° 16′ W; lat. 51° 45′ N.; population, in 1831, 20,649. It is an episcopal see, and seat of a university. It is delightfully situated on a gentle eminence, in a valley at the confluence of the Isis and Cherwell, and near the Thames. Along these rivers, and between them and the city, lies a tract of beautiful and luxuriant meadows. For the beauty and magnificence of its buildings, Oxford is equalled by few cities in the world. From the neighbouring heights it presents a grand and imposing spectacle, from the number and variety of its spires, towers, domes, and other public edifices, while these structures, by their magnitude and splendid architecture, give it, on a nearer approach, an air of the most striking magnificence. The High-street is one of the most beautiful in the world. The houses inhabited by traders are indifferent. The city contains a cathedral, thirteen elegant parish churches, houses of worship for Catholics, Quakers, Methodists, and Baptists, a town and county hall, a jail, a bridewell, an infirmary, market buildings, and charity schools. Four members are sent to parliament, two for the city, and two for the university. Markets on Wednesday and Saturday. Oxford has no staple manufacture or branch of trade, but derives its chief support from the university. It is an ancient town, was the residence of Alfred, and has often been the seat of the English kings and parliaments. The university of Oxford, from the extent and number of its buildings and institutions, and the wealth of its endowments, is by far the greatest in the world. Its origin is involved in obscurity: some suppose that it was founded, and some that it was revived, by Alfred; others fix its origin considerably later. It is, as is well known, distinguished for its attachment to tory principles, and has been the seat of classical learning in England, while in Cambridge mathematical science has been more assiduously cultivated. It consists of twenty colleges and five halls, each of which forms an establishment within itself, having its own students and teachers, revenues and regulations; yet they are all united under the government of one university. The officers by whom the university is immediately governed, are the chancellor, high steward, vice-chancellor, and two proctors. In addition to the private officers in each college and hall, who see that due order and discipline are preserved, and all the liberal sciences taught, there are twenty-three public professors of the several arts and sciences. In 1829, the members of convocation were 2365; members on the books, 5009. About one third of these are maintained by the revenues of the university; the rest live at their own expense. The students wear a peculiar dress. The buildings of the university are very magnificent, and excel those of Cambridge; yet the chapel of King's college at Cambridge is thought to surpass any single edifice at Oxford. The other edifices belonging to the university, besides the colleges and halls, are the public schools, the Bodleian library, the picture gallery, the theatre, capable of containing 4000 persons, the Clarendon printing-house, the Radcliffe library, the Ashmolean museum, the astronomical observatory, and the botanic garden. The Bodleian library is one of the largest and most valuable in Europe. (See *Libraries*.) There are four terms in the year at the two English universities. To obtain the degree of bachelor of arts, a residence of three years, or twelve terms, is necessary at Cambridge; four years, or sixteen terms, at Oxford, except in case of sons of peers, and the eldest sons of baronets and knights, who may stand candidates after three years. For the degree of master of arts, three more years are required. A person of two years' standing may be admitted a student of the civil law; after being five years a student, he may receive the degree of bachelor of civil law; and in four years more, the degree of doctor. The degree of bachelor of divinity is conferred on masters of arts of four years' standing, and the degree of doctor four years after. (See *University*.) Some of the eminent men educated at Oxford are Wickliffe, Wolsey, More, Raleigh, Chillingworth, Hampden, Harvey, Clarendon, Hale, Locke, Addison, Steele, Blackstone, Lowth, Johnson, Adam Smith, Jones, Gibbon, and Fox. The colleges and halls (see *College*), with the date of their foundation, and number of fellowships and scholarships, are exhibited in the following table:—

Colleges.	*Foun.*	*Fell.*	*Schol.*
1. Merton	1264	24	4
2. University	1280	12	17
3. Baliol	1281	12	14
4. Exeter	1314	25	1
5. Oriel	1326	18	13
6. Queen's	1340	24	16
7. New College	1386	70	
8. Lincoln	1427	12	8
9. All-Souls	1437	40	
10. Magdalen	1456	40	30
11. Brazen-Nose	1509	20	32
12. Corpus-Christi	1516	20	20
13. Christ Church	1525	20	20
14. Trinity	1554	12	12
15. St John's	1557	50	3
16 Jesus	1571	19	18
17. Wadham	1613	15	15
18. Pembroke	1620	14	30
19. Worcester	1714	21	13
20. Hertford	1740	12	4

Halls.	*Foun.*
1. St Alban's	1200
2. St Edmund's	1317
3. St Mary's	1325
4. New Inn	1391
5. Magdalen	1480

See Wood's *Historia Univ. Oxon.*, and *Athenæ Oxonienses;* Ackerman's *History of the University of Oxford;* the articles in the first and third numbers of the *Quarterly Journal of Education*, and the *University Calendar*.

OXFORDSHIRE; an inland county of England, bounded north by Warwickshire and Northamptonshire, east by Buckinghamshire, south by Berkshire, and west by portions of several counties. It extends from north to south about forty-eight miles, and its greatest breadth is twenty-six. The outline of Oxfordshire is very irregular, consisting of two parts, the northern or larger part forming an irregular triangle, joined by a narrow neck to the smaller part. The boundary on the south and south-west is determined by the course of the Thames, which makes a considerable curve in its passage between Oxfordshire and Berkshire. The soil of this county, taken generally, is extremely fertile, furnishing abundant crops of grain and grass. The land is dry, being exempt from bogs, fens, and standing pools, but by no means destitute of running water, the streams which intersect the country, and the rivers which they feed, being more numerous here than in most other parts of the kingdom. In the northern part of the county the soil is chiefly strong, deep sand, and the enclosures are formed by stone walls; the central district is rich meadow land, with a subsoil of gravel, remarkable for the multitude and variety of fossil remains which are embedded in it; and in the south, the county exhibits a pleasing alternation of hill and dale. The greater portion of the county is under tillage, and the most common corn crops are wheat, barley, and oats; peas are cultivated occasionally, and on the heavier soils beans; and among the usual agricultural products are also turnips, both common and Swedish, tares, clover, trefoil, and santfoin. The grass-land, which is chiefly on the banks of the rivers, or near the centre of the county, affords pasturage for milch cattle, and considerable quantities of butter are made here, and calves are fattened for the London market. A great many sheep are kept, and also swine, which furnish the materials for making brawn and sausages. The mineral products of this county include limestone, freestone, slate for the roofs of buildings, pipe-clay, fuller's earth, and ochre, which is found of a peculiarly fine quality near Shotover. The principal manufactures are those of blankets, for which Witney has long been noted; a kind of coarse velvet called *shag*, made at Banbury; and gloves and various articles of polished steel, made at Woodstock; besides lace-making, chiefly practised in the southern part of the county. Oxfordshire possesses one city, Oxford, which is also the county town; two boroughs, Woodstock and Banbury; and the market towns are, Bicester, Burford, Chipping-Norton, Deddington, Henley-upon-Thames, Thame, Watlington, and Witney, besides Bampton, Charlbury, and Dorchester, of which the markets are discontinued. Population of the county in 1831, 151,726.

OXFORD CHRONICLE. See *Arundelian Marbles.*

OXFORD, LORD. See *Harley.*

OXIDES. See *Oxygen.*

OXUS. See *Gihon.*

OXYGEN GAS was discovered by doctor Priestley in 1774, and by Scheele in 1775, without previous knowledge of Priestley's discovery. It received the names of *free air, dephlogisticated air, pure air*, and *vital air*, from its property of supporting combustion and animal life—terms changed, by the inventors of the new nomenclature, to *oxygen gas*, from its property of giving acidity to compounds in which it predominates (ὀξὺς, acid, and γεννάω, to produce). *Oxygen* denotes its gravitating matter, or substance, when not in the gaseous state; *oxygen gas* is the name given to it in its elastic form. Oxygen is the most extensively diffused of material substances. In the state of gas, it forms one-fifth of the atmosphere; it is, also, the principal component part of water, forming eight ninths of it by weight. It consists in acids, in the alkalies, and earths, and, consequently, in their saline compounds. It is combined with metals; is found in numerous forms of combination in mineral substances, and is an abundant ingredient in all vegetable and animal matters. It is also the most energetic, in its chemical agencies, of all the elements of matter, and the history of its properties and combinations forms the most important subject in chemistry. Oxygen gas no where exists pure and uncombined; hence certain processes are required to obtain it in an insulated form. These consist, chiefly, in applying heat to some of its compounds, in which it is retained by a weak attraction. The substances commonly employed for the purpose, are, the peroxide of manganese and the chlorate of potash. It may be procured from the former in two ways; either by heating it to redness in a gun-barrel or iron retort, or by putting it into a flask, with half its weight of concentrated sulphuric acid, and heating the mixture by means of a lamp. To obtain it from the manganese, it is only necessary to heat it to a full red heat, in an iron retort. The gas obtained by the first process is the purest; that by the latter is liable to contain small quantities of carbonic acid and hydrogen, but it is sufficiently good for ordinary purposes. Oxygen gas is colourless, inodorous, and tasteless, and is rather heavier than common air, its specific gravity being 1·111. It is absorbed by water very sparingly, 100 cubic inches of water, freed from air by boiling, absorbing about 3·5 cubic inches, under a common atmospheric temperature and pressure. Its most striking property is that of exciting and supporting combustion. A candle, or wax taper, freshly extinguished, is re-lighted on being immersed in a bottle of this gas. A partially kindled piece of charcoal, on being introduced into it, also inflames with great rapidity and brilliancy. But the most interesting combustion, in this gas, is that of iron wire, or a watch-spring, which only require to have their temperature excited by the previous burning of a piece of sulphur-match attached to them at the extremity, in order to be kindled into the most vivid and intense combustion, burning with sparks and scintillations, until pieces many inches in length, are consumed; and this in a jar of the gas not holding above three pints or a quart. Phosphorus, on being previously lighted in a pendent spoon, and lowered into a jar of oxygen gas, burns with the evolution of a light so intense as scarcely to bear being looked upon with the naked eye. During the burning, in each of these instances, the oxygen is consumed; and the products of the combustion, except in the case of the iron, are substances possessed of acid properties. Oxygen gas is equally powerful in sustaining animal life by respiration. If an animal be confined in a given quantity of it, it will live four or five times longer than a similar animal will do in the same volume of atmospheric air. If, again, an animal be confined in a gas which cannot afford oxygen to it, it immediately dies. It is found that a quantity of oxygen gas always disappears, or is consumed during respiration, and is indispensable to the continuance of life; and atmospheric air, or any gas, sustains life only from the oxygen it contains, and is capable of affording to the blood. Pure oxygen gas, however, is not well adapted to animal existence. If an animal be confined in a given quantity of it, its respiration becomes hurried and laborious before the whole of the oxygen is consumed; and it dies even though so much oxygen is present, that another animal, of the same species, introduced into the residual air, will live. From whence it appears, that pure oxygen proves too highly stimulating for animal life. As mixed in our atmosphere, it is precisely adapted to the support of animal existence. The oxygen forms only one-fifth of its weight, and is diluted with a large volume of another gas, of an opposite or negative quality. (See *Nitrogen.*) Oxygen gas has been administered, with good effects, in diseases of the thorax, in paralysis, general debility, &c. A remarkable case was that of a large dog, that had been, for several hours, completely drowned, and yet, in consequence of an injection of this gas into his lungs, was perfectly restored to life and all his functions in a very short time. Oxygen has a very powerful attraction for most of the simple bodies, and there is not one of them with which it may not be made to combine. The act of combining with oxygen is called *oxidation*, and the bodies, after having united with it, are said to be *oxidized*. The compounds, so formed, are divided, by chemists, into acids and oxides. The first division includes those compounds which possess the general properties of acids, and the second comprehends those which not only want that character, but many of which are highly alkaline, and yield salts by uniting with acids. The phenomena of oxidation are very variable. It is sometimes produced with great rapidity, and with the evolution of heat and light, as in the case of the iron wire above alluded to; on other occasions it takes place slowly, and without any appearance of heat or light, as is exemplified by the rusting of iron when exposed to a moist atmosphere. All inflammable or combustible substances derive their power of burning in the open air from their affinity for oxygen. The changes experienced by burning bodies are no less remarkable than the alteration which appears in the oxygen in which they are burned. While the oxygen loses its power of supporting combustion, the inflammable substance lays aside its combustibility, becoming an oxidized body, and incapable of being burned again, even in pure oxygen. It has also acquired an addition to its weight. It is an error to suppose that bodies lose any thing while they burn. The materials of our fires do, indeed, disappear; but when, by means of a suitable apparatus, we detain the products of the combustion, it is found that they weigh more than the inflammable matter that has been burned; and the increase in weight is exactly equal to the quantity of oxygen which has disappeared during the process. For many years before the discovery of oxygen gas, all combustible bodies were supposed to contain a certain principle, which was called *phlogiston*, to the presence of which was ascribed their combustibility. It was supposed that when a body burns, phlogiston escapes from it; and that, when the body has lost phlogiston, it ceases to be combustible, and is then a dephlogisticated or incombustible substance. A metallic oxide was consequently regarded as a simple substance, and the metal itself as a compound of its oxide with phlogiston. The heat and light which accompany combustion were attributed to the rapidity with which phlogiston is evolved during the process. The discovery of oxygen, and the experiments of Lavoisier, overthrew this doctrine. On burning phosphorus in a jar of oxygen, he observed that a considerable quantity of the gas disappeared, that the phosphorus gained in weight, and that the increase of the latter exactly corresponded to the loss of the former. That oxygen is really present in the oxidized body, he proved by a very decisive experiment. Some liquid mercury was confined in a vessel of oxygen gas, and exposed to a temperature sufficient for causing its oxidation. The oxide of mercury, so produced, was put into a small retort, and heated to redness, when it was re-converted into oxygen gas and fluid mercury, the quantity of the oxygen being exactly equal to what had combined with mercury in the first part of the operation.

OYER AND TERMINER (*French*, to hear and determine,) in English law, is a court held by virtue of the king's commission, to hear and determine all treasons, felonies, and misdemeanors. This commission is usually directed to two of the judges of the circuit, and several gentlemen of the county; but the judges only are of the quorum, so that the rest cannot act without them. (4 *Black*. 269.) See *Assizes*.

O YES (corrupted from the French *oyez*, hear ye) is an expression used by the crier of a court, in order to enjoin silence when any proclamation is made.

OYSTER; a well known edible shell-fish, belonging to the genus *ostrea*, occurring in most parts of the world. The European oyster (*O. edulis*), which forms a considerable article of trade on the coasts of England and France, is generally taken by dredging, after which the animals are placed in pits formed for the purpose, furnished with sluices, through which, at spring tides, the water is suffered to flow. In these receptacles, they acquire the green tinge so remarkable in the European oyster, and which is considered as adding to their value. This colour, which at one time was supposed to be owing to some mineral impregnation, has recently been ascertained to arise from the *conferva*, and other marine vegetable matter, on which the animal feeds. In many places, oysters are *planted*, as it is called: that is, large artificial beds are formed in favourable situations, where they are permitted to fatten and increase. The breeding time of oysters is in April or May, from which time to July or August, the oysters are said to be *sick*, or *in the milk*. This is known by the appearance of a milky substance in the gills. Oysters attain a size fit for the table in about a year and a half, and are in their prime at three years of age; though what the natural term of their lives may be, it is difficult, if not impossible, to determine with any degree of accuracy. Many curious discussions have arisen as to whether oysters possessed the faculty of locomotion. It is well known that, in general, they are firmly attached to stones, or to each other; and it has been stated, and generally believed, that they are not endowed with any powers of changing their position. From the observations and experiments of naturalists, however, it appears that they can move from place to place by suddenly closing their shells, and thus ejecting the water contained between them with sufficient force to throw themselves backward, or in a lateral direction. Oysters form the basis of many culinary preparations, but are much more digestible in their raw state than after any mode of cooking them, as this process, in a great measure, deprives them of the nourishing animal jelly which forms so large a portion of their substance. The shell of the oyster is composed of carbonate of lime and animal matter, and was, at one time, supposed to possess peculiar medical properties; but analysis has shown that the only advantage of these animal carbonates of lime over those from the mineral kingdom arises from their containing no admixture of any metallic substance. The lime obtained from the calcination of oyster shells, though exceedingly pure and white, is better suited for work which does not require great tenacity, as for plastering rooms, than for the common purposes of building, as it does not form as hard a compound with sand as the mineral limes.

P

P; the sixteenth letter and twelfth consonant in the English alphabet. It is one of the mutes and labials, and represents a sound produced by closely compressing the lips till the breath is collected, and then letting it issue. (For the similarity and mutual interchange of *b* and *p*, see *B*.) P also interchanges in many languages with other letters, as in *Polly*. for *Molly*. The dialects of Upper Germany in general prefer the *p*, those of Lower Germany the *b*; and Ihre declares all Swedish words beginning with a *p* to be of foreign origin. The Π of the Greeks signified 80; in low Latin, P signified, according to Ugution, 100:

P similem cum C numerum monstratur habere;

according to Baronius, 7. In music, *p* signifies *piano* (softly). S. P. S. P. is an abbreviation for *St Peter* and *Saint Paul*, as on the papal seals. On medals, P stands for various names of persons, places, and qualities, as *pater*, *populus*, *pius*, *perpetuus*, *pontifex*, *proconsul*, &c.; P. P., *pater patriæ*; S. P. Q. R., *senatus populusque Romanus*; P. M., *pontifex maximus*; C. P., *Constantinople*. It is a curious circumstance, that the Romans gave to their P the same form which the Greeks had given to their Rho. pp is used in German as a sign for *&c*. The Hebrews had no *p*, and used the *ph* instead. The Arabians have no *p*. On visiting cards, *p. p. c.*, *p. f. s. a.*, or *p. d. a.*, are abbreviations for *pour prendre congé*, *pour faire ses adieus*, or *pour dire adieu*, and signify the taking of leave. See *Abbreviations*.

PACA (*cœlogenus*); a genus of animals inhabiting South America, living in the woods, in the vicinity of water, concealing themselves in superficial burrows, which have three openings to them. They are thick set, and of a clumsy form, and, when full grown, measure about two feet in length from the tip of the nose to the extremity of the body, and about one foot in height both before and behind; for, although the hinder legs are much longer than the anterior, they are so bent as to allow a much greater proportion of their length to touch the surface of the ground. Their eyes are large, prominent, and of a brownish hue, their ears nearly naked, and their whiskers long and rigid. They swim and dive remarkably well, and run with considerable swiftness. Their cry is not unlike that of a pig. Their flesh is said to be very savoury, and forms a staple article of food in many parts of South America. They seldom leave their burrows, except during the night, when they sally forth in search of their food, which consists of herbs and fruit. They are taken alive by closing two of the openings to their burrows, and digging up the third. They often make an obstinate defence, and are capable of biting very severely. They are readily tamed, and might prove a valuable addition to the stock of domestic animals, especially in the Southern States, where the winter is not sufficiently severe to injure them. They are very prolific, and, in a warm climate, would require but little attention.

PACHA, or PASHAW; the military governor of a Turkish province. The most distinguished have three horse-tails carried before them; the inferior, two. The power of a pacha is very great. He is, however, appointed and removed at the will of the sultan, is obliged to serve when called on in the wars of his master, and to pay over a certain portion of the revenue of his province into the imperial treasury. The provincial administration is entirely in his hands.

PACIFICATOR. The attitude of a person who makes peace, or performs any other act of grace, consisted, among the ancients, in the horizontal extension of the right arm, the hand being quite open. —No title was so much coveted by Napoleon as that of *pacificateur*, at the beginning of his power; hence it appears so often on the early medals commemorating his exploits. Alexander of Russia, too, was highly desirous of the same character. Nothing flattered him more than the praise of having given peace to the world.

PACIFIC OCEAN; the great mass of waters extending from Beering's straits to the Antartic circle, a distance of 3200 leagues, and from Asia and New Holland to America. It is separated from the Atlantic and Antarctic oceans only by imaginary lines. The Andes and Rocky mountains of the western coast of America, and a series of mountainous ranges near the eastern coast of Asia and New Holland, nearly surround this vast basin. Its extreme breadth a little north of the equator is 4550 leagues; between South America and New Holland (lat. 30° S.) it is 2970 leagues. (See *Ocean*.) It contains an infinite number of isles scattered over its surface, more particularly between lat. 30° N. and 50° S., to which modern geographers have given the general appellation of *Oceanica*. (q. v.) It was at first called the *South sea*, by the European navigators, who entered it from the north. Magellan gave it the name of *Pacific*, on account of the prevalence of calms which he experienced in it; but it by no means deserves this name, as it is remarkable for the fury of its storms and the agitation of its waters. The trade-winds, which constantly blow between the tropics, render the passage from the western coast of America to Asia very short; but the return is proportionately difficult. (See *Winds*.) The Portuguese were the first Europeans who entered the Pacific, which they did from the east. Balboa, in 1513, discovered it from the summit of the mountains which traverse the isthmus of Darien. Magellan sailed across it from east to west in 1521. Drake, Tasman, Beering, Anson, Byron, Bougainville, Cook, Vancouver, Lapérouse, and others, traversed it in different directions, in the seventeenth and eighteenth centuries. D'Entrecasteaux, Krusenstern, Kotzebue, Beechey, &c., have visited it more recently.—See Burney's *Chronological History of Discoveries in the South Sea* (5 vols., 4to, 1803—1817). See, also, *North Polar Expeditions.*

PACTOLUS; a river of Lydia, celebrated for its golden sand. (See *Midas.*) After flowing by Sardis, it emptied into the Hermus.

PADANG. See *Sumatra.*

PADERBORN, formerly an imperial bishopric, in the circle of Westphalia, was attached, in 1802, to Prussia, in 1806 to the kingdom of Westphalia; on the dissolution of which, it was restored to Prussia. The capital, of the same name, with 6700 inhabitants, is situated at the sources of the Pader. The university of Paderborn was suppressed in 1819. There is still a gymnasium here, with a seminary for priests, five monasteries, and a cathedral. Lat. 51° 43′ N.; lon. 8° 43′ E.

PADISHAH; a title assumed by the Turkish sultan, derived from *pad* (protector or throne), and *shah* (king, prince). The Ottoman Porte formerly applied this name only to the king of France, calling the other European sovereigns *kral*; but it has since been applied to some of the other leading princes of Europe.

PADUA (in Italian *Padova*, anciently *Patavium*); an old and strong city of the north of Italy, in a province of the same name, in the Austrian government of Venice. It is connected with the Brenta by a canal. Population, 46,600; lat. 45° 24′ N.; lon. 11° 52′ E. Among the ninety-six churches is the cathedral, which is one of the richest in Italy. The sacristy contains a portrait of Petrarch, who held a canonry in it, and bequeathed it a part of his library. The church of St Justina is esteemed one of the most beautiful in Upper Italy. In front of it is the public square *prato della valle*, anciently *campus Martius*, adorned with statues of celebrated Paduans. The Franciscan church *chiesa del santo* contains many splendid monuments and valuable curiosities. In front of it stands the equestrian statue erected by the republic of Venice to her general Gattamelata. The Episcopal seminary, restored by cardinal Barbarigo, an excellent institution for the education of 100 young clergymen, contains a celebrated printing establishment, to which belongs a collection of Latin, Greek, and Oriental manuscripts. The celebrated university was founded by the emperor Frederic II., who, in 1222, transferred the university of Bologna to Padua. The medical faculty is the most highly esteemed. The number of students was formerly several thousands, from all the countries of Europe; at present it is about 400 in all departments. The celebrity of this institution procured for the city the epithet *la dotta* (the learned) among the Italians. The principal university building, *il palazzo degli studj*, is adorned with portraits of the most eminent professors. It has twelve colleges, an observatory, a botanical garden, an anatomical theatre, &c. There is also in Padua a branch of the royal institute of science and art, a society of science and agriculture, &c. Among the buildings, the town-house (*palazzo della ragione*), containing a bust of Livy (q. v.), who was a native of Padua; the *palazzo della podestà*, with a public library; the theatre, &c., are particularly worthy of mention. The grave of the Trojan hero Antenor, who, according to Virgil, was the founder of Padua, is still shown here. After the fall of the Roman empire, Padua fell into the hands of the Lombards, from whom it was taken by Charlemagne. Under his successors, it came under the dominion of Ezzelin, afterwards received a republican government, but, in the fourteenth century, came under the dominion of the powerful family of Carrara, and was conquered by Venice in 1405. Commerce is chiefly in the hands of the Jews, who live in a separate quarter of the city. The woollen and silk manufactures are considerable. In summer the city is thronged by the rich from the neighbourhood, particularly at the time of the fair in June. The territory of Padua (*il Padovano*) is one of the most fertile and beautiful countries in Europe, and contains 300,000 inhabitants. On the abolition of the republic of Venice, the town and territory fell to Austria; were afterwards ceded to Napoleon; but, in 1814, were restored to Austria, and now form a part of the Lombardo-Venetian kingdom.

PÆAN, or **PÆON** (*παιαν, παιων*); a surname of the healing power, particularly of Apollo. The etymology and signification of this epithet are differently explained by different critics. In the hymns to Apollo, the phrase *Io Pæan* was frequently repeated, and hence they were also called *pæans*. They were sung in time of sickness, and on other occasions, when it was desirable to propitiate the favour of the god. Hymns to other deities, or songs in praise of heroes, were at a later period likewise called *pæans*. A pæan was sung, previous to battle, in honour of Mars, and after a victory, in praise of Apollo.

PÆDOBAPTISTS. See *Baptists.*

PÆONY (*pæonia*); a genus of plants belonging to the natural family *ranunculaceæ*, distinguished for the size and magnificence of the flowers. The species are herbaceous, or very rarely shrubby, having perennial, tuberous roots, and large leaves, which are more or less divided. The flowers are solitary, and of a white or purplish colour. Seventeen species are known, of which one inhabits the North-West coast of America, and the other the temperate parts of the Eastern continent. Several are cultivated in gardens, where they are very conspicuous, especially when the flowers are doubled.—The common pæony (*P. officinalis*) grows from ten to twenty inches in height. The leaves are bi or triternate, and the flowers are disposed at the extremity of the branches, are very large, and ordinarily of a fine red colour. The double variety, which is now so common every where, when introduced at Antwerp, about the end of the sixteenth century, sold for twelve crowns a root. This plant is a native of the mountains of the south of France, Spain, and Siberia. It was celebrated among the ancients, who attributed to it various marvellous properties, but has now lost all such reputation.—The tree pæony (*P. mon-tan*), in our climate, is not usually more than three or four feet high, but, in China, its native country, is said to attain the elevation of ten feet, or even a much greater. It was discovered in the mountains of Honan about the year 400, but did not attract the attention of the Chinese till two or three centuries after. When once known, its culture spread with amazing rapidity, and large sums of money were sacrificed to procure fine varieties. For more than a thousand years, it has been generally cultivated by the Chinese, who plant it in the open air, but take unwearied pains during its growth, protecting it from the dust, high winds, and heavy rains, by means of tents, and dispensing the heat and light of the sun at their pleasure. They have varieties of all colours,—white, yellow, red, purple, violet, blue, and even black. The Chinese name is *mou-tan*. The most common variety with us has superb flowers, of a clear red or rose colour, and from five to seven inches in diameter, which, besides, diffuse a very agreeable odour. It is hardy enough to bear our winters, but does not flower in such perfection as when protected. A rich light soil is best adapted to it; and ripened cuttings, planted in a shady place, will take root freely.

PÆSTUM (called by the Greeks *Posidonia*); an ancient Greek city of Lucania, Lower Italy, lying in a plain at the foot of mount Alburnus, on the Sinus Pæstanus, or gulf of Salerno. It is celebrated by the Latin poets for the fragrance of its twice-blowing roses, and its mild and balmy air. Nothing now remains of it but some fragments of its walls, of two temples of Doric architecture, and of a forum. The city is thought to have been founded by a Greek colony from Sybaris (q. v.), 510 B. C. It was destroyed by the Saracens in the ninth century. The coins of Pæstum, as well as its ruins, show it to have once enjoyed great prosperity. The ruins were discovered in the middle of the last century.

PÆTUS. See *Arria*.

PAGANS; the worshippers of many gods, the heathen, who were so called by the Christians, because, when Constantine and his successors forbade the worship of the heathen deities in the cities, its adherents retired to the villages (*pagi*, hence *pagani*, countrymen), where they could practise their ceremonies in secrecy and safety. In the middle ages, this name was given to all who were not Jews or Christians, theirs being considered the only true religion and divine revelations; but, in more modern times, Mohammedans, who worship the one supreme God of the Jews and Christians, are not called *pagans*. The idea of heathenism is of early origin. Moses used every precaution to prevent an intercourse between the Hebrews and heathen nations, prescribed the renunciation of idolatry as a requisite to citizenship in the Hebrew state, and forbade any league with the Ammonites, Moabites, &c. When the kings relaxed in the observance of these regulations, the prophets raised their voice against the defection. The distinction between pagans and non-pagans, so far as claims to a revelation are concerned, is very slight, since there are many heathenish people who have traditions of revelations made to them. We also find in some religions of paganism (for example, with Zoroaster, Plato, and Socrates) pure and elevated notions, and precepts of morality, which would not disgrace even Christianity. Paganism has likewise her moral heroes, as well as Judaism and Christianity. And although St Augustine declared that the virtues of the heathens were but splendid vices, yet this assertion is by no means borne out by facts. The true point of distinction is, therefore, to be placed in the recognition or denial of one, universal, perfect Being, that is, in the reception of monotheism or polytheism. The apostle Paul speaks, (*Rom.* i. 23) of a law of God written on the hearts of the gentiles or pagans, and declares that pagans who live by this divine law in their consciences, are a law unto themselves; and that, to every man who does good, God will render "glory, honour, and peace, to the Jew first, but also to the gentile, for there is no respect of persons with God." (*Rom.* ii. 10, 15.) Clement of Alexandria, and many of the fathers, were of opinion that, as God had given prophets to the Jews, so he had raised up great men among the heathen, and thus rendered both capable of arriving at the enjoyment of divine happiness. These views, however, met with strong opposition. Augustine, although he acknowledged that the virtues of a Brutus, Decius, and Regulus, were subjects of admiration, and proper models of imitation, yet maintained the principle that all the noble and good actions of the pagans were done in the service of the devil, and from vain glory. His views obtained such an ascendency, that it came to be a generally received opinion, that the hope of God's grace and eternal happiness depended on a belief in the doctrines of the church. Jerome adopted an intermediate principle, attributing to the heathens a willingness to receive the doctrines of the true church, should they become known to them. If this *fides implicita*, as it is called, be any thing real, it can only be a desire and endeavour to know the truth, and to act accordingly. Others have maintained the action of divine grace on the souls of heathens, independent of all instruction and knowledge on their part. The influence which the writings of Augustine exercised at the time of the reformation, and on the reformers, led to the reception of the dogma of the damnation of the pagans, which acquired a new development from the doctrine of predestination. Marmontel's *Bélisaire* was condemned by the Sorbonne, because it professed a belief in the salvation of the pagans — See Meiner's *Allgemeine kritische Geschichte der Religion;* Schlegel, *Ueber den Geist der Religiositat aller Zeiten und Völker* (2 vols., Hanover, 1819); Constant, *Sur la Religion* (Paris, 1824.) It is estimated that the number of polytheists is about 466,000,000; that of monotheists, 362,000,000.

PAGE (from παις, child); a youth retained in the family of a prince or great personage, as an honourable servant, to attend in visits of ceremony, carry messages, bear up trains, robes, &c., and, at the same time, to have a genteel education. See *Chivalry*.

PAGLIAJO, or PAGLIACCIO; the name of a comic mask in the Neapolitan comedy. The word signifies *cut straw*, because this is what the poor fellow lies on. The German term *Pajazzo*, for the *Merry Andrew* in the circus, is a corruption of this word.

PAGODA; the temples of the Hindoos, and other heathen nations of Southern Asia. They are built of wood and stone, on an open place, which is adorned with obelisks, columns, and other architectural works. They are of great size and height, and embellished with great splendour. They are generally in the form of a cross, the four ends of which are of equal length, with a lofty, tower-like roof, divided into several compartments. The most remarkable pagodas are those of Benares, Siam, Pegu, and particularly that of Juggernaut (q. v.) in Orissa. In the interior of these buildings, besides altars and statues of the gods, there are many curiosities. The statues, which are likewise called *pagodas*, and which are often numerous, are usually rude images of baked earth, richly gilt, but without any kind of expression; sometimes clothed, and sometimes nude; standing or sitting with the legs crossed, and often of a colossal size. Small figures with movable heads, which are brought from the East, are also called *pagodas*.

PAINE, THOMAS; a celebrated political and deistical writer, was born in 1737, at Thetford, in Norfolk, where his father, a Quaker, was a staymaker. He received his education at a grammar school in his native place, but attained to little more beyond the rudiments of the Latin language. He seems afterwards to have paid great attention to arithmetic, and to have obtained some knowledge of the mathematics. In early life, he followed the business of his father, and afterwards became a grocer and exciseman at Lewes, in Sussex, but was dismissed for keeping a tobacconist shop, which was incompatible with his duties. The abilities which he displayed in a pamphlet written to show the propriety of advancing the salaries of excisemen, struck one of the commissioners, who gave him a letter of introduction to doctor Franklin, then in London. The latter recommended him to go to America. He took his advice, and, reaching Philadelphia in 1774, in the following January, became editor of the Pennsylvania Magazine, which he conducted with considerable ability. Hostilities having commenced between the mother country and the colonies, he composed his celebrated pamphlet, entitled Common Sense, which was written with great vigour. The object of this tract was to recommend the separation of the colonies from Great Britain. For this production, the legislature of Pennsylvania voted him £500. He also received the degree of M. A. from the university of the same province, and was chosen a member of the American philosophical society. To these rewards was added the office of clerk to the committee for foreign affairs, which, although a confidential situation, did not justify him in assuming the title of "late secretary for foreign affairs," which he did in the titlepage of the Rights of Man. While in this office, he published a series of political appeals, which he denominated the *Crisis*. He was obliged to resign his secretaryship in 1779, owing to his having divulged some official secrets in a controversy with Silas Deane, whom he accused of a fraudulent attempt to profit by his agency, in conveying the secret supplies of stores from France. The next year, he obtained the appointment of clerk to the assembly of Pennsylvania, and, in 1785, on the rejection of a motion to appoint him historiographer to the United States, received from congress a donation of 3000 dollars. He also received 500 acres of land from the state of New York. In 1787, he embarked for France, and, after visiting Paris, went to England, with a view to the prosecution of a project relative to the erection of an iron bridge, of his own invention. This scheme involved him in pecuniary difficulties, and, in the course of the following year, he was arrested for debt, but was bailed by some American merchants. On the appearance of Burke's Reflections on the French Revolution, he wrote the first part of his Rights of Man, in answer to that celebrated work. The second part was published early in 1792; and, May 21, in that year, a proclamation was issued against wicked and seditious publications, alluding to, but not naming, the Rights of Man. On the same day, the attorney-general commenced a prosecution against Paine as the author of that work. While the trial was pending, he was chosen member of the national convention for the department of Calais; and, making his escape, he set off for France, and arrived there in September, 1792. On the trial of Louis XVI., he voted against the sentence of death, proposing his imprisonment during the war, and his banishment afterwards. This conduct offended the Jacobins, and, towards the close of 1793, he was excluded from the convention, on the ground of his being a foreigner (though he had been naturalized); and, immediately after, he was arrested, and committed to the Luxembourg. Just before his confinement, he had finished the first part of his work against revelation, entitled the Age of Reason, being an Investigation of true and fabulous Theology; and, having confided it to the care of his friend Joel Barlow, it was published; by which step he forfeited the countenance of the greater part of his American connexions. On the fall of Robespierre, he was released, and, in 1795, published, at Paris, the second part of his Age of Reason; and, in May, 1796, addressed to the council of five hundred a work entitled the Decline and Fall of the System of Finance in England, and also published his pamphlet entitled Agrarian Justice. Fearful of being captured by British cruisers, he remained in France till August, 1802, when he embarked for America, and reached Baltimore the following October. He had lost his first wife the year following his marriage, and, after a cohabitation of three years and a half, had separated from a second, by mutual consent, several years before. Thus situated, he obtained a female companion in the person of a madame de Bonneville, the wife of a French bookseller, who, with her two sons, accompanied him to America; but, whatever was the nature of this connexion (at the age of sixty-five), which has been differently represented, the husband and children, with the wife, became his chief legatees. His subsequent life was by no means happy; for, although occupied in various mechanical speculations and other engrossing pursuits, and possessed of decent competence, his attacks upon religion had exceedingly narrowed his circle of acquaintance; and his habitual intemperance tended to the injury of his health, and the ultimate production of a complication of disorders, to which he fell a victim June 8, 1809, in his seventy-third year. Being refused interment in the ground of the society of Friends, which favour he had requested before his death, he was buried on his own farm. The strong part taken by this extraordinary man in religion and politics has produced such extremes of praise and execration, that there exist few or no sources of unbiassed information, either as to his abilities or character, except his writings. That he possessed much native vigour of intellect, is indisputable, and, concentrated as it became by resolute exclusion of multifarious acquirement, and of even a moderate recourse to books, it assumed, in his writings, that piquancy, force, and simplicity, which, of all qualities, secure the largest share of general attention in popular controversy. The political pamphlets, letters, and addresses of Paine are numerous, and may be found in the collective editions of his works. They are also enumerated at the end of his Life by Sherwin. See his Life by Cheetham and Sherwin.

PAINTER'S COLIC. See *Colic*.

PAINTING, in a technical sense, is the art which represents the appearance of natural objects on a plane surface by means of colours, so as to produce the appearance of relief. As a fine art, its highest object is the beautiful, exhibited in visible forms by colours. The noblest field of the painter is that in which he vies with the poet, embodying ideas, and representing them to the spectator; but, as there are innumerable gradations in poetry, from the most elevated epic or drama to the shortest song, the excellence of which may consist merely in giving effect to a single sentiment or situation, comic, touching, &c., so pictures may present all varieties from the elevated productions of a Michel Angelo, in the *Capella Sistina*, to the image of a single dewdrop, a leaf, a cat in a Flemish piece. And just as taste may degenerate in respect to poetry, and prefer insipidity, bombast, or false glitter to true poetical beauty, so taste may degenerate, and has degenerated, in respect to painting; and a portrait, the greatest praise of which was that every single hair of the beard might be seen by a microscope, has been thought extremely "natural," and valued more highly than the most poetical compositions. It is but little praise to say of a picture, in this sense, that it is *natural*. We have spoken of this subject in the article *Copy*, where the reader will find some observations on the necessity of genius even in copying nature—of genius which can extract the essential, characteristic, and distinguishing. A painter must have the creative power of a poet. Why do we find so many portraits *appallingly* like the original, so as to be recognised at first glance, and which yet leave a disagreeable impression? The reason is that the painter copied with Chinese accuracy the form before him, but could not discover the spirit which animated the form, nor reproduce the original, breathing with life. The case is similar with other objects of the art. A plant, a flower, a tree, may be so copied as to give the form accurately, and yet be destitute of the appearance of life. To produce this, it is necessary to have an eye for the soul of nature, to catch its breathing spirit. Still more necessary is the poetical spirit when the artist undertakes his noblest work—an historical painting. A Parnassus or School of Athens by Raphael, a Last Judgment by Michel Angelo, an Olympus by Cornelius, is a poem; and we see also the near relationship of poetry and painting from the circumstance of the two arts being so ready to afford each other assistance. The painter furnishes ornaments and illustrations to the works of the poet, and the poet often interprets in verse the beautiful productions of the painter. The great difference between them is that the painter can express a state of things only during a single moment, whilst the poet can unfold his scenes at pleasure; but, on the other hand, the painter can show much in a moment, and therefore make a deep impression, whilst the poet can give only word by word. Hence, also, the effect of the representation of the drama is so great, because it unites, as it were, poetry and painting—the ear and the eye both receive at once. The art of painting is divided, according to its subjects, into representations of man, of the lower animals, and of inanimate nature. The first are generally called *historical* paintings, even if their subject is not taken from history, and include allegorical and mythological, as well as real historical representations. Even battle pieces, scenes from common life, and portraits, have been classed under historical paintings. Historical painting is the noblest and most comprehensive of all branches of the art, because it embraces man, the head of the visible creation—man in all his relations. The historical painter, therefore, must study man in all his situations and relations, from the anatomy of his figure and the attitudes of the model to the most rapid and slightest expression of feeling and the ebullitions of deep and violent passion. He must have technical skill, a practised eye and hand, and must understand how to group his skilfully executed parts so as to produce a beautiful composition; and all this is insufficient without a poetic spirit, which can form a striking conception of an historical event, or create imaginary scenes of beauty. There is a remarkable passage in the works of the famous composer Maria von Weber. He speaks of the impression which a beautiful landscape makes upon him, a lovely or brilliant sunset, &c. Every thing, he says, presents itself to his soul in a musical form, in concords and discords. Whatever he perceives resolves itself into music, and thus becomes truly impressive to his soul. This is the case with every true artist. Speak of a noble idea to a sculptor, and involuntarily it will crystallize in a plastic form in his mind. Read a stirring passage of history or an interesting poem to a painter, and the whole will pass in pictures before his imagination. According to the branch of the art which he particularly cultivates will be the effect of particular passages. The comic painter will perceive the comic traits in such passages just as the satirist involuntarily seizes upon the contrasts and inconsistencies of life. This must be, to a great degree, the effect of natural constitution. No one can give himself this power; yet it must be cultivated, if the individual aims at being truly an artist; for, though a lively imagination may easily embody interesting scenes in visible forms, yet whoever has conversed with artists has found how difficult it is for a young artist to present upon canvas a picture which he had thought was distinct in the highest degree in his mind. To obtain this skill requires long practice in drawing and painting: the artist must have executed numerous studies, be familiar with the folds of drapery and the expression of feeling. But just as poets often imagine that they compose when their minds only connect unconsciously reminiscences of poems which have made a deep impression upon them, so painters too often believe they compose when they but render what they have seen elsewhere. Originality of mind is one of the first requisites of a painter.

Landscape painting is not of so vast an extent as historical painting, yet it requires much study and great natural talent. If landscapes are not copies of beautiful or favourite scenery, if the landscape painter *composes*, he wishes to convey his feelings expressively and harmoniously by means of natural objects, whilst the historical painter is much more *objective*; i.e. he represents ideas and feelings not so much with reference to their connexion with himself. The landscape painter generally, though not always, indeed, aims more at the mere expression of feeling; hence is more *subjective*. (See *Objective*.) The landscape may become allegorical and historical (in the meaning of the term in the art of painting) by being adorned with figures. Of the former the works of the living landscape painter Frederic are examples, and of the latter those of Claude Lorraine and Poussin. But the landscape painter must be careful not to disturb too much the effect of his landscapes by giving too great importance to the figures. The chief study of the landscape painter is the vegetable world, and none can make such use of the whole world of colours as he. Yet air, water, rocks, buildings, all require to be carefully studied by him. Flower and fruit paintings, still life, and arabesques, should be mentioned here. The first require, more than any other kinds of painting, the imitation of nature; in fact, to paint fruits requires little else than close copying, though even here, there would be a difference between a naked copy of a fruit made for a horticultural society and a fruit-piece painted as such by a Van Huysum. There is, even in fruits, an ideal beauty which must animate the painter, and the elements of which he must extract from nature. Arabesques are the wild creations of a rich imagination, and not unlike the unrestrained productions of a poetical mind in the Arabian Nights; and, with all their wildness, they can show the genius of a true artist, and ought to do so, if they claim to be considered works of art. How fanciful and lovely are some arabesques, where flowers and leaves entangle birds playing around human figures which end in plants and fruits!

The third chief division is *animal* painting, more circumscribed than either historical or landscape painting, yet a valuable branch of the art, whose highest aim is to represent with truth and life the character of the different species of animals, so important an element of surrounding nature. In some cases this branch approaches that of portrait painting; and, as we have said that the latter requires the power of reproducing not merely the bare forms of the individual, but his life and character, so it is, in some cases, with animals; and the portraits of favourite race-horses would poorly satisfy the connoisseur, did they not express the individual *character*, not merely the bare form of the horse. Other divisions of painting have reference to the technical part of the art. The encaustic painting of the ancients (see *Encaustics*) is not now known, though the modern *encaustics* approach near it. We should mention also painting on enamel, on glass, on porcelain, mosaic painting (q. v.) &c. In regard to the materials, there is painting in fresco, which belongs to painting in water colours, and miniature painting,

painting in pastel, and oil painting (q. v.). In reference to the ground upon which the picture is made, we have tapestry painting and wall painting, glass and porcelain painting, &c.

History of Painting.—Painting naturally divides itself into the ancient and modern, because there is a decided difference between the two periods of the art. Of an oriental art of painting before the Greek and Roman, not much is to be said, as respects those qualities which make painting truly a fine art. In a full history of painting, indeed, the considerable perfection to which the Egyptians had carried the art of representation, and the incomparable excellence which they had reached in some branches of the technical parts of the art, would require to be treated of. Art, in the true acceptation of the word, says a connoisseur, can be attributed only to the idealizing nations, who have borrowed their cultivation from the Greeks; beyond this limit we find only fantastic colouring to animate large masses or to supply the deficiencies in picture-writing, yet always calculated for a sense dull in respect to the beautiful, capable of being affected only by glaring colours, and subject to the rules of custom and worship. Only in countries where alphabetical writing existed, could painting elevate itself to a fine art. Wherever painting remained faithful to its first object,—that of conveying historical information,—it was obliged to sacrifice the beautiful to the significant. In Egypt and Mexico, the art of painting seems to have been chiefly intended to convey certain information by a bare imitation of objects. The early Hindoo was indemnified, by the variegated charms of the colours which his country afforded, for the want of purity and correctness of drawing. With the ancient Persians, also, the art of painting was undoubtedly what it is still, an irregular mixture of colours, fantastic images, without design and keeping. With the Egyptians, who so decidedly influenced the civilization of the Greeks, the art of painting was chiefly the offspring of religious wants, and stood in a close yet subordinate relation to sculpture and architecture. Egyptian pictures are found, of the most ancient times, on the walls of temples and in tombs, on the covers and coffins of mummies, and on the rolls of papyrus. Belzoni and Champollion agree as to the great beauty which these pictures, still brilliant on the walls, impart to the venerable monuments of Egypt. They are hieroglyphic or historical representations, painted works of sculpture, consisting of deeply cut lines, filled with colours or metals, as is the Isiac table—a most important monument of that species. The pictures on the walls and catacombs are colossal figures, painted with deep outlines, and surrounded by smaller pictures. In these also the claims of taste appear subordinate to the clearness of expression, and the durability of the colours, which are laid on without half tints and shades. At a later period, this Egyptian painting became common in Rome.—See among other works, Bottiger's *Ideen zur Archaologie der Malerei* (vol. i. Dresden, 1811). We find the eldest Greek school of painting on the coasts of Asia Minor and the islands. Fortunate circumstances here gave an early impulse to the art, the rudiments of which we find even in the Homeric times, in the coloured carpets and weavings. A representation of the defeat of the Magnesians (719 B.C.), by Boularchus, is mentioned as the first considerable picture; yet the accounts which we have of it are probably exaggerated. From this source the Greek colonies in Italy and Sicily are said to have received the germs of art. In Greece Proper, also, we find the art of painting originally a companion of sculpture for religious purposes. The idols of the original savage Greek were most probably coloured, so that, even in later times, it was long before the Greek could resolve entirely to give up colouring his statues. The last remnant of this was the colouring of the eyes, or the making them of enamel and stones. It was long before painting appeared in sacred pictures independent of the plastic art. The cornices of the temples, the *relievi* of the pediments, the galleries, &c. were originally painted. The proper art of painting must have proceeded from drawing, which commenced with fixing the outlines of shadows. From drawings the first step was to monochromes. The next step was to point the contours with one colour, then to represent the roundness of the body by light, shade, and gradation of colour. The most ancient remnants of this way of painting are the pictures on vases with black figures, similar to *silhouettes*. This manner was continued till late. The *style*, which was used in painting on coloured wax tables, prepared skins of animals, and smoothed tablets of boxwood, sufficed for the linear drawing, which, according to the anecdote of Apelles (q. v.) and Protogenes, must have reached great perfection among the Greeks. The *polychrome*, the drawing with different colours, supposed a more artificial instrument—the brush, moved by the hand with greater ease and freedom. Among the few artists of this period, whose names have come down to us, is Penænus, the cousin and assistant of Phidias. He was the first who contended for the prize of painting at the public games at Corinth and Delphi. His wall pictures in the Atheneum at Elis, his pictures in the temple of Jupiter at Olympia, the painting of the Pœcile in Athens, with the battle of Marathon, together with his portraits of the Greek and Persian generals in several pictures, have brought his name to us, as well as his painting and ornamenting of the statue of Jupiter. In general, we must observe that the Persian invasion of Greece makes an epoch in the art of painting, as in every other fine art in Greece. Perhaps it was at an earlier period that Mycon painted. He was the rival of Polygnotus, and also ornamented the Pœcile and the Theseum with representations of the battles of the Amazons and Centaurs. In Polygnotus of Thasos the art of painting attained independence about 420 B. C. His merit consists in a greater and livelier expression, in variety of drapery and symmetrical distribution of figures. In the distribution of light and shade, Apollodorus of Athens (404 B. C.) seems to have much advanced the art. Zeuxis (q. v.), about 378 B. C. elevated the art to beauty; he exhibited a canon of beauty in his famous Helen. His rival, Parrhasius of Ephesus, inclined more to grace, or the female expression of beauty. His pure proportions and his graceful colouring rendered him famous. Timanthes of Samos attained the highest degree of perfection in expression. Apelles (q. v.) connected with the utmost truth of nature a flattering colouring, and is called a master in portrait painting. After him painting sunk into artificial prettiness and insipidity, and even devoted itself to the representation of ordinary and vulgar subjects (*typurography*). Among the Romans, this art awakened little interest. At an early period, they knew only the paintings of the Etruscans; and Fabius, who was surnamed *pictor*, stands alone in the annals of Roman art. At a later period, the Greeks became the teachers of the Romans, when their civic virtue had already gone, and luxury had taken its place. Many monuments of the ancient art of painting have been discovered in the tombs and baths of Rome, Pompeii, and other places of Italy, which consist chiefly of fresco paintings and mosaic work. The number of existing monuments of Greek and Roman painting, however, is so small, that the inquirer must often be satisfied with mere conjectures, assisted by comparison with the works of these nations in other arts, and by the testimony of classic authors. Yet learned archæologists seem to acknowledge universally that the art of painting in antiquity always remained behind sculpture, as well in respect to the degree of its employment as of its perfection. Hence the well known opinion that painting was then more plastic. In consequence of a number of causes, both intellectual and physical, sculpture was more cultivated with the Greeks; and painting was influenced by this circumstance. The form, even in painting, predominated over the charm of colouring, and the expression which it conveys. The contour and the local colours seem to have been perfected in a great degree; the perspective much less. Some, indeed, have doubted whether the ancients had any knowledge of perspective; but, as perspective is not to be dispensed with in any representation on a plane surface, and as the ancients were well acquainted with geometry and optics, we must suppose them to have possessed, in some limited degree, the use of perspective. It is more certain that they were ignorant of *chiaro-scuro*. Their art of painting, indeed, was limited chiefly to the representation of historical situations and of animals; but landscape painting remained comparatively uncultivated, because this branch depends more than the others upon the perfection of colouring and the charm of *chiaro-scuro*.

For the history of the ancient art of painting, see, among other works, Junius *De Pictura Veterum* (edit. Grævius, Rotterdam, 1694); Durand's *Histoire de la Peinture ancienne* (after Pliny, London, 1725); Turnbull's *Treatise on Ancient Painture*, &c. (London, 1740); Vinc. Requeno's *Saggi sul Ristabilimento dell' antica Arte de' Greci e de' Romani Pittori* (new edition, Parma, 1787, 2 vols.); Andr. Riem, *Ueber die Malerei der Alten* (Berlin, 1787, 4to); Grund, *Ueber die Malerei der Griechen* (Dresden, 1810, 1811, 2 vols.); and Bottiger's works above-mentioned. Respecting the materials, and the technical part of painting among the Greeks and Italians, see Hirt, in the Transactions of the Berlin Academy, from 1798 to 1803, and Stieglitz, *Ueber die Malerfarben der Griechen und Römer* (Leipsic, 1817). Copies of antique pictures, particularly Roman ones, are found in the works of Bartoli and Bellori (e. g. *Recueil des Peintures antiques*, Paris, 1757 and 1784), in which several fresco paintings (e. g. those found in the *casa di Pito*) are described and copied; also in Carletti's and Pance's descriptions of the baths of Titus, and in the collection of the antiquities of Herculaneum, and Millingen's *Peintures antiques* (Rome, 1813).

The art of painting attained a greater perfection after the introduction of Christianity; nay, it became predominant over the plastic art. In Christian or modern times, sentiment, feeling, became a prominent feature of works of art; and these can be expressed much more easily and much more perfectly by colours than by the rigid forms of sculpture. For this reason the modern or Christian period has, in respect to the fine arts, been termed *romantic*, in contradistinction to *classic* (q. v.); and for the same reason the art of painting is called pre-eminently *romantic*, as is also the modern art of music. The baron de Rumohr maintains that the first application of the art of painting to Christian subjects took place in sepulchres. The later Grecian school or art is generally considered as the common parent of the whole modern art of painting in Europe. Properly speaking, it is the transition from ancient to modern art. With Constantine, modern art travelled to Constantinople, which he founded on the site of the ancient Byzantium (A. D. 330), and many pictures and statues accompanied him. (See Heyne in the *Comment. Soc. Götting.*, vol. xi.) In the later period of paganism, Greek and Roman art were so blended that no difference existed between them, until the conquest of Italy by the Lombards. In the pictures of the time of Justinian, the mechanical skill of former times was preserved, though the art, in its higher requisites, had deteriorated. (See *Byzantine Art*.) We often find mention in this period of works in mosaic, and encaustic painting seems still to have been in vogue. (See Fiorillo's *History of Painting*, vol. i., p. 30.) In the fourth century, and still more in the fifth, the custom of placing pictures of saints in the churches became more and more common, both in the Eastern and Western church. This custom inspired the artists with a new zeal, and the Christian religion, or, to speak more properly, the Christian worship, became the field in which the modern art grew and flourished. Not unfrequently the art contributed to the propagation of the religion. It suffered much, however, under the sway of barbarous tribes; but it never ceased entirely, and was fostered by the popes and bishops. Pictures of a religious kind were esteemed, particularly in the West, and many legends of their supernatural origin were diffused among the credulous. But from 726 the iconoclasts (q. v.) arose, and many Greek artists emigrated to Italy. Here the art was chiefly nourished; yet the painters diminished in number from the ninth century. In the thirteenth century began a new period of the art in Italy. The representatives of the Italian school are Michel Angelo, Correggio, Raphael, Titian, &c. Their endeavour was to present the beautiful in the noblest forms, and to transfer the ideal of the antique to the art of painting. (See *Italian Art*.) Another branch of the Byzantine art was the Rhenish or old Cologne school, which extends from the fourteenth century to the fifteenth. Its works have the decided stamp of the Byzantine school, which ceases with the brothers Eyck, who imitated nature. Their example was followed and improved upon by Hemling, Meckenem, Michel Wolgemuth, Martin Schon, and the painters of the sixteenth century, Luke of Leyden, Alb. Durer, Schoreel, Mabuse, Bernard of Orley, &c. Some maintain, that there are but two schools essentially different,—the Italian and the Netherlandish,—while the German, French, and British artists belong to the one or the other, according to the character of their works. (For the Netherlandish school, which again was divided into the Dutch and Flemish, see *Netherlandish School*; see also *German* and *French Art*, in the articles *Germany*, and *France*.) —The true creator of modern landscape painting was Giorgione, born 1477. The Flemish painter, Mathew Brill, who is generally considered the founder of this branch, painted landscapes seventy years later. —See Deperthes's *Histoire de l'Art de Paysage depuis la Renaissance des Beaux Arts jusqu'au XVme Siècle* (Paris, 1822), and *Théorie du Paysage*, by the same.

The endeavours of more recent times do not form so connected a whole as the Greek art. For some time the art of painting had sunk from its highest destination; landscape and portrait prevailed, and in many countries continue to do so, while engravings multiplied the master pieces of former ages. In France, the revolution, and afterwards the warlike period of Napoleon, gave birth to several great historical paintings, some of which contain uncommon beauties, though in general the style is not popular out of France. The theory of painting has been much developed in its technical parts, i. e. drawing, perspective, colouring, &c. more than in its higher departments, which may be found treated of in the works of Cennini, Leonardo da Vinci, Mengs, Algarotti, De Piles, Watelet, Du Bos, Richardson, Reynolds, Dan. Webb, Lessing (in his Laocoon), Winckelmann, Fuseli, Fiorillo, Goethe. For the well known works of Vasari and Lanzi, see these articles. Rumohr's Italian Researches (Berlin, 1827, 2 vols.), and Memes's History of Sculpture, Painting and Architecture, in Constable's Edinburgh Miscellany are also valuable.

PAINTING ON GLASS. See *Glass*.

PAISIELLO, GIOVANNI; a celebrated singer and musician, was the son of a veterinary surgeon of Tarento, in Italy, where he was born in 1741. From the age of five to that of thirteen, he was placed by his father at the Jesuits' college in his native city, where his musical talents first exhibited themselves in the matin services performed in the chapel; and the chevalier Carducci, who superintended the choir, prevailed upon his friends to send him to Naples for further instruction in the science. Accordingly, in 1754, he was put under the care of the celebrated Durante, at the conservatory of St Onofrio, where his progress was very rapid; and, in 1763, his first opera (*La Pupilla*) was performed, with great applause, at the Marsigli theatre, in Bologna. From this period commenced a long career of success, which attended him at Modena, Parma, Venice, Rome, Milan, Naples, and Florence, till, in 1796, he was induced to enter the service of Catharine II. of Russia, who settled on him a pension of 4000 rubles, with a country house and other advantages, in his capacity of musical tutor to the grand duchess. In Russia he remained nine years, when he returned to Naples, visiting Vienna in his way, and continued in the service of Ferdinand IV. till the court retired into Sicily. On the French revolution extending to Naples, Paisiello, who remained behind, received from the republican government, now established, the appointment of composer to the nation. On the restoration of the Bourbon family he fell into disgrace, but, at the expiration of two years, was restored to his situation. Napoleon afterwards sent him an invitation to come to Paris, which he accepted, but declined the directorship of the imperial academy, which was offered to his acceptance, contenting himself with that of the chapel. After remaining in the French capital nearly three years, his own health and that of his wife compelled him to return to Italy, where, on the expulsion of the Bourbons, he was made chamber musician to Joseph Bonaparte, receiving at the same time from Napoleon the cordon of the legion of honour and a pension of 1000 francs. In this situation he continued under Murat, and became a member of many learned and scientific as well as musical societies, especially of the Napoleon academy of Lucca, the Italian academy of Leghorn, and the French institute. There are few composers who have given greater proofs of industry than Paisiello, or whose works have met with greater success all over Europe. His operas, serious and comic, exceed seventy, besides a great variety of ballets, cantatas, and some sacred music of great merit. He died in 1816, at Naples, and was honoured with a public funeral. Simplicity, elegance, and correctness are the characteristics of his style, while his grace and freshness of melody, in which he has far surpassed most other composers, have made him a model to numerous imitators.

PAISLEY; a large manufacturing town of Scotland, in Renfrewshire, situated on the banks of the White Cart river, about seven miles south-west from Glasgow. It is a place of considerable antiquity, but its rise to importance, as a manufacturing town, is only of recent date. In 1164, a priory for Cluniac monks was founded here by Walter, lord high steward of Scotland. The institution was dedicated to St James and St Mirren, the latter a Scottish confessor. It was afterwards constituted an abbey; and the lands belonging to it were, by king Robert II., a descendant of the founder, erected into a regality, under the jurisdiction of the abbot. The name of the religious establishment was *Passeleth* (modified to Paisley), supposed to be derived from the British words *Pasgel-loith*, which signify "the moist pasture ground." The abbey had under its patronage the following churches: Innerwich in Lothian, Ledgerwood in the Merse, Rutherglen, Carmunnoch, Dalziel, Riccarton, Craigie, Dundonald, Monkton, St Quivox, Prestwick, Corsby, Cumbray in Bute, St Oswald, Turnberry, Roseneath and Kilpatrick in Dumbartonshire, Kilcolmonel, Kilkerran, and Kilfillan, in Argyleshire, Cathcart, Eastwood, Mearns, Neilston, Paisley, Kilbarchan, Lochwinnoch, Innerkip, Erskine, Houston, and Kilellan, in Renfrewshire. The monks of the abbey wrote a chronicle of Scotland, called the Black Book of Paisley, an authentic copy of which was carried out of Sir Robert Spottiswood's library by general Lambert to England, and is now preserved in the Cottonian library. After the reformation, the abbacy was secularised, and in 1587 erected by James VI. into a temporal lordship, in favour of lord Claud Hamilton, third son of the duke de Chatelherault, who thus became lord Paisley. The monastic buildings were much enlarged and improved by the abbot, George Shaw, who, in 1484, encompassed the precincts of the monastery with a wall of hewn stone. There is hardly a vestige of the convent now existing, and modern buildings have been erected on the site of the gardens; but the nave of the abbey church (now used as a parish church), with its aisles, is still standing; and from these remains, it appears to have been a noble structure, in the decorated Gothic style. It was repaired about fifty years ago, in an elegant and substantial manner. At its south-eastern angle is a vaulted sepulchral chapel, which is the burying-place of the earls of Abercorn, descended from lord Paisley above-mentioned. It contains the monument of Margery, the daughter of Robert Bruce, who, by her marriage with the founder of the abbey, conveyed the hereditary right to the crown of Scotland to the family of Stuart. This chapel is also distinguished by a very fine echo.

More than a hundred years ago, when Crawford wrote his History of Renfrewshire, Paisley seems to have been an inconsiderable town; for he describes it as consisting of only one principal street, about half a mile in length, with a few lanes and old buildings on the west bank of the Cart. Since that time, it has gradually increased in size, and now consists of two portions, the burgh, or Old Town, extending to a great extent along the southern slope of a ridge of hills to the west of Cart; and the New Town, on the eastern side of the river, communicating with the Old Town by three stone bridges. This latter district was feued or leased by the earl of Abercorn about 1770, and now comprises a number of handsome streets. The length of Paisley and suburbs, from east to west, is about two miles; while its breadth, from north to south, is only about seven furlongs.

In 1488, Paisley was erected into a burgh of barony by James VI., under the superiority of the abbot, George Shaw; and it is governed by a provost and three bailies, in the commission of the peace, a treasurer, a town-clerk, and seventeen councillors. The revenues of the burgh amount to about £2500 a-year. The town formed a part of the abbey parish of Paisley previously to 1738, when the magistrates and council purchased the right of patronage from the earl of Dundonald, then superior of the lordship; and, in 1782, it was divided into three distinct parishes, encompassed on all sides by the original parish of the abbey. They are in the presbytery of Paisley and synod of Glasgow and Ayr. There are now six churches belonging to the establishment, the most remarkable of which are the High church, the Low church, St George's church, and the Middle church. There are also churches or chapels for the Episcopalians, the Roman Catholics, the Secession, the Baptists, the Cameronians, the Communion of the Relief, the Independents, and the Methodists; besides several other denominations of Christians. Here is a public grammar-school; and in each of the parishes is established an English school, to the emoluments of the master of which is added that arising from the office of session-clerk of his parish. Besides these, there are other seminaries for the education of poor children; and among the charitable institutions are an almshouse, rebuilt in 1724; a house of recovery or infirmary; a town hospital, a capacious but plainly built edifice; and a poor house, a large building, in an open situation opposite the quay, supported by a mall assessment on the inhabitant housekeepers.

Among the finest public buildings of Paisley is the astle, founded in 1818, a Gothic structure, which stands in an open space on the western bank of the Cart, and which comprehends a court-house, council-chambers, prison, bridewell, and a number of offices for different departments of public business. The market-day of Paisley is Friday; and fairs, each of three days' duration, are annually held there, beginning on the third Thursday of May and February, and the second Thurday of August and November; but the August fair, called the St James' Day fair, is the most considerable, being distinguished by horse-racing and general holiday keeping.

The country around the town is called the *parish of the abbey of Paisley*, the extent of which is about nine miles in length, and from half a mile to three miles in breadth. The surface is irregular, swelling, particularly in the neighbourhood of the town, into gentle eminences. Towards the north of the town it is remarkably level, having formerly been a morass, but now cultivated. On the opposite side of Paisley, the ground is hilly; one of the eminences, called *Stanley brae*, being 680 feet above the level of the sea at flood. The soil varies considerably; but is chiefly light loam, rendered tolerably productive by long culture, but wet and cold, from having a bottom of close impervious till.

The first species of manufacture for which Paisley became celebrated, was that of linen thread; and the origin of the trade in this commodity, is attributed to Miss Catharine Shaw, daughter of the laird of Bargarron, who, a few years previous to the union of Scotland and England, had acquired great dexterity in the spinning of fine thread. Some of her thread was taken to Bath by lady Blantyre, and disposed of to the lace manufacturers there at a very high price. The superiority of the article created for it a great demand; but there being no free trade between the two kingdoms at the time, considerable difficulties were opposed to the traffic, which were, however, in some measure overcome by the intervention of mercantile agents in Holland. The facilities for trade consequent upon the union, soon rendered the spinning of thread an extensive and lucrative branch of trade to the town. Besides the introduction of the thread manufacture, Miss Shaw is otherwise noted in the annals of Paisley. In 1697, when she was a girl of only eleven years of age, she imagined, or feigned that she had been bewitched, and no less than twenty persons were implicated with the of[illegible] five of whom suffered death at the Gallow-green of Paisley. Even at the era of the union, according to Crawford, Paisley manufactured some linen and muslin, but the produce could not be very extensive, as we find that, in the year 1727, twenty-one years subsequent to the union, not more than 85,527 yards were manufactured for sale in the whole shire of Renfrew. The extension of trade after the Union induced many persons to settle in Paisley, for the purpose of manufacturing. These persons belonged chiefly to a class of men, formerly very numerous and useful in the kingdom, called *pedlars*, who were, in fact, travelling merchants. These persons bought the articles made in Paisley, and disposed of them to the merchants in England. Ere long, the enterprising merchants of Glasgow seeing the lucrative nature of such a trade, bought largely from the Paisley manufacturers, and sent the articles for sale to the London or some foreign market. As trade increased, the capital of the manufacturers increased; and they began so early as 1750 to trade directly with a London house, and to add to the variety of their articles of produce. The year 1759 is an important era in the commercial history of Paisley. It was at this time that the manufacture of silk gauze commenced, in imitation of the fabrics at that period manufactured at Spittalfields; and from the cheapness of labour in Paisley, as well as from the care and superior taste displayed by the manufacturer and weaver, the Paisley gauzes soon gained an ascendency in the market, so much so, indeed, as to induce several of the Spittalfields manufacturers to remove to Paisley. The trade extended rapidly, so that in 1781 there were not fewer than twenty mercantile establishments in the town of Paisley, some of which had warehouses in London, Dublin, Paris, and other large towns on the continent. At this period, 5000 looms were employed in weaving silk gauze; and the value of this manufacture alone for that year, has been estimated at £350,000 sterling. The manufacture of silk ribbons, and some new silk fabrics, was introduced in 1772; and such was the extent of trade, that Wight has stated that the manufacturers of Paisley drew for silk gauzes in each of the years 1775 and 1776, the sum of £300,000, and upwards of £100,000 for other articles. The value of this manufacture of silk and linen gauses, thread, and other kinds of goods, amoumted to £579,185 : 16 : 6 sterling. In the silk gauze manufacture of Paisley, there were employed 26,484 men, women, and children. (See Brown's History of Glasgow, p. 247, vol. ii.) From this period, the silk gauze manufacture of Paisley began rapidly to decline, and the current of industry was entirely changed in its direction by the introduction of the cotton manufacture. It was about the year 1782, that some cotton spinning factories were erected in the shire, and the muslin manufacture began to form a new and important feature in the commerce of Paisley. The following statement shows the variety and extent of the manufactures here in 1789: that of silk gauze employed 10,000 persons, and produced goods worth £350,000; that of lawns, cambrics, thread, gauze, and muslins, employed 12,084 persons, and produced £180,385; that of white thread employed 4809 persons, and produced £70,000; that of soap and candles produced £48,000; that of ribbons, &c., £2000; the tanneries, &c., £10,000; whence the total value of the manufactures appears to have been £660,385.

From a very careful survey we are enabled to state that in November, 1836, there were in Paisley,—

Manufacturers,		148
Harness weavers,	4162	Total 5270
Plain weavers,	1108	

Total employed by Paisley houses in twenty-six villages, in Renfrew and Ayrshire, and in the city of Perth,	4147
Total weavers at Paisley work. . . .	9417

Such is the expedition now attained in finishing the shawls after they come from the loom, that in several establishments it is not uncommon for the cloth to be taken from the loom, cut, washed, dried, calendered, and packed for London in three hours afterwards.

The muslin trade has been carried on in all its varieties, and with great vigour, in Paisley; and this place has been regarded as the original seat of that manufacture; although it cannot be disputed, that the first muslin web ever made in Scotland was begun and finished in Glasgow, by Mr Monteith. Every species of plain and figured goods, composed of silk and cotton, continue to be manufactured here; and Paisley has become celebrated throughout the world for the variety and richness of its fancy fabrics. It is a well known fact, that although Edinburgh was for a long time celebrated for the superiority of its shawls, yet a very great number of these were woven in Paisley for Edinburgh houses. About twelve years ago, the Canton crape shawls began to be imitated here; and with such success has this branch been prosecuted, that the Paisley shawls must now be regarded as at least equal to the Chinese originals. A very beautiful species of shawls, called Chineil, began about the same time to be made here, which have an appearance resembling the costly productions of the East. Each of these shawls is composed of several webs of different colours interwoven with great ingenuity, so as to produce the most beautifully variegated patterns. This manufacture, which is entirely of Paisley origin, will be fully described under our article *Weaving*.

The Paisley manufacturers have of late paid considerable attention to the formation of woollen shawls, and fabrics of Thibet and Merino wool have been manufactured in this town, which have met with a ready acceptance in the market. Within these two years, woollen shawls of a coarser texture have begun to be manufactured, in imitation of the tartan shawls made at St Ninians. At present (December, 1836), the demand for the richer fabrics of the Paisley manufacture has suffered a temporary depression, which must have thrown many workmen idle, had not a late improvement in the figured muslin wrought by harness been made, which has opened a new line in the manufacture. In 1832, very considerable distress was felt among the young females of Paisley, in consequence of the introduction of a newly invented machine from France, for clipping or cutting away the superfluous woof from the fabrics woven in the harness loom. Several hundred women had been constantly employed for this purpose, previous to this date; but the economy of cost to the manufacturer was so great, by the employment of the clipping machine, that its rapid introduction deprived these women of their ordinary means of living. But the evils arising from this, as well as all other machinery for diminishing the demand for human labour, were only temporary, and the women ere long were employed in other branches of industry. In one establishment, for instance, about 150 are engaged in embroidery. The machine for clipping will execute the work as well as by the hand, for about one-ninth part of the cost. The diminution of the cost of the manufacturer must enable him to bring his articles to market at a lower rate, and an increased demand must be the natural consequence. Add to this, the still further diminution of cost of production caused by the introduction of machinery, for dispensing with the attendant called the drawer or drawboy in harness weaving. The weekly wage of a drawer may on an average be reckoned at 3s., which forms a very considerable item in the cost of manufacture. A machine for performing the same work was many years ago invented by M. Jacard, a native of France, which, however, from difficulties in its management, was very partially used even ini Paisley. Early in the present year Mr J. Morrison patented a machine somewhat on the same principles as that of Jacard, but so much improved and extended in its operations, that it may be fairly regarded as a new machine. The ingenuity of Mr Morrison has totally overcome all objections to the employment of the drawing machine. Mr M. has also invented a machine for punching the patterns, which exhibits a highly ingenious application of lever power. These drawing machines are daily gaining ground, and from their unerring precision, and the economy of their use, they must ere long become universal in the harness manufacture. Such is the perfection of this machine, that its application to power looms cannot be far distant. Much improvement in the manufacture of figured shawls may be confidently expected from the establishment of a school of design at Paisley, in which young men will be taught pattern drawing, as in the school at Lyons. Preparations for the establishment of this seminary are already nearly matured. Calico printing, tape and thread manufacture are carried on here, as also cotton spinning, and power loom weaving. Paisley has been long celebrated for its distilleries, and there are also soap and tan works. The annual value of the Paisley manufactures may be estimated at nearly two millions sterling. The river Cart is not navigable by vessels of any considerable burden, and although it has lately been the subject of public speculation to deepen it, yet the great expense requisite for such an undertaking renders it probable that it will be long ere that be accomplished. A much more reasonable plan for facilitating the commerce of the town is now in progress, i. e. a railway between Paisley and the Clyde at Renfrew, and it is besides in contemplation to form a railway between Greenock and Glasgow, through Paisley, with branches to Kilmarnock, &c. For an account of the canal between Paisley and Glasgow, see our article *Canal*.

Paisley is entirely a manufacturing town, and owes its increase and importance to the skill, enterprise, and industry of its inhabitants. The working classes of the town and neighbourhood have long been distinguished for their general intelligence on most branches of useful knowledge, and particularly for the lively interest they take in passing political events. Paisley has given birth to Alexander Wilson, the celebrated American ornithologist, to Robert Tannahill, the Scottish song writer, and to one of the most eloquent and witty authors of any age, Professor Wilson of Edinburgh. The progressive increase of the town will be best seen from a statement of its population at different periods. In 1695, the number of its inhabitants was about 2200; in 1755, they amounted to 4600; in 1781, they had increased to nearly 16,000; in 1791, to 19,903; in 1801, to 24,341; and in 1821, to 38,500. In 1831, the population of the town parishes was 31,460; of the Abbey parish, 26,006; total, 57,466. See *Renfrewshire*.

PALADIN. This was the name formerly given to the knights-errant, who wandered about the earth to give proofs of their valour and their gallantry. They obliged every knight whom they met in their travels to acknowledge their mistress as unrivalled in beauty, or, in case of refusal, to engage in mortal combat. The first adventurers of this kind mentioned in the old romances belong to the round table of King Arthur in England; the most famous of them was the beautiful Lancelot of the lake. After him Amadis of Gaul held a high place among the knights errant; and, still later, the paladins of Charlemagne, the most distinguished of whom was his (so called) nephew, the brave Roland, or Orlando.—The history of knight-errantry is as much mingled with fabulous stories as the accounts of the Grecian heroes. The name of *paladin* is derived either from *palatinus* or from *palus*, a pointed piece of wood, a wooden spear or lance, which these knights commonly carried as their weapon, together with the sword.

PALEMON. See *Melicerta*.

PALÆOGRAPHY, the science of deciphering ancient written monuments, not only teaches how to read old writings, but to separate their constituent parts; to ascend, as far as possible, to their sources, and to follow all the changes which one and the same writing may have gone through by the lapse of years, showing likewise the alterations which several kindred dialects have undergone after their separation from the common stock. This is the definition given by Kopp, whom Germany now esteems the first among her palæographers. The province of palæography extends, therefore, to every thing written, and is consequently increasing every day by the new discoveries of written monuments in countries formerly inaccessible. It is distinguished from diplomatics, however, by the circumstance that the latter has to deal with public and official documents illustrative of history since the fifth century. Palæography first received a scientific form from Bernard de Montfaucon's *Palæographia Græca*. Barthélemy, the author of the Travels of the Young Anacharsis, by his *Essai d'une Paléographie Numismatique* (*Mem. de l'Académie des Inscriptions, tome* xxiv. 30), put the palæography of the Semitic languages on a footing corresponding to that of the classic. Hegel, in his palæographic fragments (On the Writing of the Hebrews and Greeks, Berlin, 1816), and Hartmann of Rostock in his Investigations concerning Asiatic Monuments, have greatly enriched the science. The greatest difficulty has been found in those abbreviations which in Latin documents have been known by the name of *notæ tironianæ*, and were in use until the tenth century. After many unsuccessful attempts, they have been wonderfully explained by the sagacity of Kopp. This study has been a favourite one in France since the time of the benedictine St Maur. The *Corpus Inscriptionum* of Bockh, which is appearing at Berlin, is expected to throw much light on the inscriptions of ancient Greece.

PALÆPHATUS; an ante-Homeric poet of Athens. Another Palæphatus, probably of the fourth century (according to some, of Athens; according to others, from Paros or from Priene), left five books On Incredible Things, in which mythuses are explained allegorically. It is generally printed together with Esop. The best edition of the separate work is by Fischer (Leipsic, 1789).

PALÆSTRA. See *Gymnasium*.

PALAFOX. See *Saragossa*.

PALAIS ROYAL, in Paris. This palace, with its gardens, its courts, its galleries and arcades, is the central point of pleasure in Paris. It was built in 1663, by cardinal Richelieu, who gave it the name of *palais cardinal*. He bequeathed it to Louis XIII., after whose death Anne of Austria entered it, in 1642, with her infant son, Louis XIV., quitting the Louvre, where she had previously resided. From that time it has borne the name of *palais royal*. Louis XIV. resigned the occupation of it to his brother, and at last gave it to his grandson, the duke of Chartres. Since then, it has remained in the family of Orleans, which made it their abode until 1791, and returned thither in 1816. Frenchmen who remember it as it was in the last century, speak with rapture of the great avenue of chestnut trees, which formerly extended the whole length of the garden. From eleven o'clock in the morning it was crowded with people; there were seats on each side, which were always filled with men of all ranks and all countries. In the centre was a tree—the famous *arbre de Cracovie;* under its shade the politicians decided the fate of the world: this was ever the most liberal spot in Paris. The trees were afterwards superseded by rows of booksellers' and jewellers' shops, gambling and coffee houses, theatres, and other establishments of the kind. This assemblage brought a rich revenue to the duke. The walkers avenged themselves with jokes, for the loss of their trees: they called the duke the *egorgeur des ombres*. In three years, two of the great wings were finished, the arcades of which were immediately crowded with splendid shops. New rows of trees were planted, but they did not flourish, probably on account of the dust raised by the crowd, which perpetually throngs the gardens. The *théâtre Français* was also placed in the *palais royal*, and yet remains there. During the revolution, the duke called this palace the *palais égalité*. In 1802, it had, for a short time, the name of *palais du tribunat*. The principal entrance to the *palais royal* is upon the *rue St Honoré*. The front is seen from the *chateau d'Eau*—a building containing the reservoirs of water for the Tuileries and *palais royal*. The two front wings, with Ionic and Doric pillars (each of which is adorned with a pediment and statues by Pajou), are joined together by a Doric portico. Three gates afford entrance to the palace. Upon entering the first court, the two wings of the buildings here appear adorned with Ionic and Doric pillars. Between them is the outer court, which leads from the first court into the second (*la cour royale*). Massive Doric pillars arise on each side, but their effect is destroyed by the number of the booths and shops, which are crowded together about them. The second court is separated from the garden by wooden galleries, and there the booksellers and pamphlet sellers, the milliners and riband venders, exhibit the articles in which they deal. Through this *galerie de bois* one enters the fairy land of the garden, surrounded by its splendid arcades. This garden has no shade; it is stiff and dry; the ground is hard-pounded gravel; the trees are small and quickly withered, being struck by the reflected rays of the sun. But the effect of the arcades and pavilions, especially in the evening, when they are brilliantly illuminated, is truly splendid. The two side wings have a length of 700 feet, and the opposite ones a length of 300. They are all of similar form. Fluted pilasters, of the Composite order, surround the building, and support a balustrade, upon which are vases, which cover its whole length. On the level ground, a vaulted gallery surrounds the building, with 180 arcades, between every two of which is suspended a large lamp. They terminate, on both sides, in two vestibules, adorned with magnificent columns. The intervals are ornamented with festoons and bass-reliefs. Over the arcades is the first story, with high windows, proportionate to the building; above this, the second story, with lower windows; and above this, the windows in the roof, before which runs the terrace. Here gratifications are held out to every appetite and desire. The book shops afford the oldest and the newest, the most scientific, and the most frivolous books. Celebrated and unknown writers here meet, and the place swarms with critics and amateurs. A splendid jeweller's shop, which fills three arcades, is, in the evening, lighted up by more than fifty wax lights, and large mirrors increase the light and the play of colours. The elegant shops of the milliners afford all that fancy can create with riband and gauze, with flowers and feathers. One lofty arch glitters with brilliant silk stuffs; another with the finest cloths, the richest Eastern shawls, or the most delicate embroidery. Shops with watches of every kind alternate with others filled with beautiful porcelain: here are ornaments of Wedgewood ware and of diamonds; there are gold watch-chains, sword-hilts of polished steel or of silver; here are exhaled the most delicious perfumes; there, beautiful miniature pictures or splendid engravings attract the eye; bonbons and mathematical instruments, playthings and arms, are exhibited in beautiful variety; in one place we meet with a shop which contains all articles of dress, made in the most exquisite taste; in another, with luxurious furniture. Lottery-ticket sellers and money-changers, seal-engravers and, pastry-cooks, restorateurs and fruit venders, are all crowded together. The choicest delicacies, from the sea and from the provinces, are collected in the celebrated *boutique au gourmand*, while the best ice is to be found in the *café de foi*, where assembles the most select company. In the *café des aveugles* is heard the gayest music, executed by blind persons, while loud cries and reckless gayety resound from the *café du caveau* and the *café du sauvage*. The *café du ventriloque* attracts many guests to witness the performances of its proprietor; and the *café des mille colonnes*, to view its thousand brilliant mirrors. All the articles for sale in the *palais royal* are dearer by one half, than in the rest of Paris. Every thing here appears to be intended for the gratification of the senses: nothing spiritual, pure, or natural finds a congenial atmosphere, and the uncorrupted stranger soon wishes himself away from this intoxicating labyrinth. But the upper halls are still more seducing and dangerous than the galleries. Here, in the first story, between the rich shops and the brilliant halls of the *restorateurs*, are the infamous gambling-rooms, where, at the green tables, *roulette* and *rouge et noir* stand ready for their victims. In the attics live the shopkeepers, whose places of business are below; and also a few public girls, under the charge of older women, though neither in such numbers nor so well educated as they are represented in the accounts of most travellers. At every hour of the day, men are to be found walking in the *palais royal*. Early in the morning, the industrious tradesman passes through it to breathe the fresh air before he goes to his labour. The inhabitants are yet plunged in sleep. At eight o'clock the shops are opened, and at nine the coffee-houses begin to fill; the newspaper-readers assemble, and the groups collect. From twelve to two, it is the rendezvous of the gay world. The benches are insufficient; hundreds of straw-bottomed chairs, which are piled up under the trees, are brought forward, and let for two sous each. From two to five, the crowd diminishes, but the nursery maids, and mothers, with their little children, employ this interval; soon, all those who frequent the theatre pass by in crowds. About eight o'clock, the public women appear in the garden: at a later hour, they are found, for a short time, in still greater numbers, in the galleries, which the police allows them for their walks. The brilliant illumination now begins, and the hours, until eleven, are noisy and variously employed. After eleven, the noise gradually ceases and at twelve the gardens are empty, and every thing is still. The walks are watered three times a day, so that the dust is not troublesome. A pleasant coolness is preserved by a large fountain, in the middle of the garden, with a *jet d'eau* in twenty-four streams. From the gardens one can also pass, through a second gallery, into the court, where the most beautiful flowers and foreign plants are to be had. Another entrance leads, by an open staircase, into the splendid *rue Vivienne*. The *palais royal* is the richest and most faithful picture of the frivolity and luxury, of the sensuality and corruption, of modern times.

PALAMEDES; one of the Grecian heroes at the siege of Troy, said to have been the son of Nauplius, king of Eubœa, and of Clymene. After having, with the other Grecian ambassadors, in vain demanded of Priam the restitution of Helen, and having discovered the feigned madness of Ulysses, by which this prince had hoped to escape participation in the Trojan war, he joined the army of the Greeks. In the councils of the heroes, he opposed the measures of Agamemnon, and, for a while, took his place as commander-in-chief. Homer, however, says nothing of this conduct of Palamedes. The accounts relating to him, and especially to his death, are very contradictory. The most common are, that Ulysses buried a treasure in his tent, and, by a forged letter, brought him under suspicion of a correspondence with Priam, whereupon he was stoned to death as a traitor. To him is attributed the invention of dice and of dramatic entertainments, or, at least, the introduction of the latter, and also the invention of arithmetic, and of weights and measures. He is commonly said to have added four letters (ϑ, ξ, φ, χ) to the old Greek alphabet of sixteen letters, introduced by Cadmus. A knowledge of astronomy and of medicine is also ascribed to him. He is likewise said to have written poems. According to general tradition, he played a distinguished part in the early history of Grecian improvement.

PALANQUIN, or PALANKEEN; a sort of litter, or covered carriage, used in the East Indies, and borne on the shoulders of four porters, called *coolies*, eight of whom are attached to it, and who relieve each other. They are usually provided with a bed and cushions, and a curtain, which can be dropped when the occupant is disposed to sleep. The motion is easy, and the travelling, in this way, is safe and rapid.

PALATINATE, UPPER and LOWER, were two countries of Germany. (For the derivation of the name, see *Palatine*.) The Upper Palatinate was a territory of 2756 square miles, bordering on Bohemia and Bavaria. Amberg was the seat of government. Until 1620, the Upper and Lower Palatinate belonged together; but when the elector Frederic V. (son-in-law of James I. of England), after the battle of Prague, was put under the ban of the empire, the Upper Palatinate was given to Bavaria. The Lower Palatinate, or Palatinate on the Rhine (1590 square miles, with 305,000 inhabitants), was situated on both sides of the Rhine. This territory is, in spite of the horrible devastations which it has suffered from time to time by war, one of the most productive parts of Germany. In consequence of the great changes in Europe, after the first French revolution, the country which formerly constituted the Palatinate on the Rhine, is now possessed by Prussia, Bavaria, Baden, Hesse-Darmstadt, Nassau, &c.

PALATINE (from *palatium*, the word used in the middle ages to signify the *royal palace*) was originally applied to persons holding an employment in the king's palace, and afterwards to one invested with royal privileges and rights. (See *County Palatine*.) In Hungary, *palatine* signifies the highest baron of the realm, or *magnate* (q. v.), chosen by the diet from among four *magnates* proposed by the king (the emperor of Austria), in order to represent the latter, in all important affairs. He is president of the council of regency, of the highest court of appeal, and has the highest rank of all the *magnates*, except the archbishop of Gran. There was none from 1765 to the death of Joseph II. (1790). Leopold II. yielded to the complaints of the Hungarians, and appointed a new one. The archduke Joseph Anthony, brother to the emperor Francis, born 1776, is the present palatine.

PALATINE, COUNT (*comes palatinus*), was the judge and highest officer of the Franconian and German kings. Every regal castle (*palatium;* in German, *Pfalz*), of which there were some in every part of the realm, had such an officer. The count of the palace of Aix-la-Chapelle (*archisolium totius regni*) was the first among them, and one of the first crown officers of the empire. The county palatine on the Rhine originated from the dotation to him. Each of the ancient duchies had also its county palatine. At a later period, the German emperors appointed *comites S. palatii Lateranensis*, to exercise certain imperial privileges, also, in the territories of the members of the empire. There were two classes of them, one with more power (*comitiva major*) than the other, authorized to raise to nobility, and confer the *comitiva minor;* the other had the power to make doctors and notaries, to legitimate natural children, confer coats of arms, &c. At present, the whole dignity of the palatine court is a mere antiquated form.—*Palatium* was used, in many countries, for the regal palace and the privileges connected with it; hence, in England, the counties palatine. See *Palatine.*

PALATINE HILL, PALATIUM. See *Rome.*

PALE, THE ENGLISH. See *Ireland.*

PALEMBANG. See *Sumatra.*

PALENQUE; a village of Central America, in the state of Guatemala, about 215 miles N.W. of the city of Guatemala. It is remarkable for the ruins of a great city which it contains, and which, lying in the centre of an immense wilderness, were not known to the Europeans till 1750, when they were discovered by some Spaniards. In 1787, captain Del Rio was employed, by the king of Spain, to examine them. The ruins extend along an elevated ridge, for the distance of about twenty miles, and consist of bridges, aqueducts, palaces, temples, &c., all of stone; from which circumstance the Spaniards call them *casas de piedras.* The London Literary Gazette of October 15, 1831, contains a letter from Galindo, commander of the neighbouring district of Peten, giving an account of his investigations on the spot. The ruins, according to him, contain numerous figures of men and animals, in relief, some of colossal size, together with paintings, and what he conceives to be characters representing sounds, or a phonetic alphabet, of which no traces have been elsewhere found in America. There is no tradition, among the natives in the vicinity, as to the time of their origin or their builders. See *Writing.*

PALERMO, the capital of the kingdom of Sicily, and of an intendancy of the same name, is situated on a small gulf on the northern coast of Sicily; lat. 38° 6′ N.; lon. 13° 21′ E. It is a well built and strongly fortified city; the harbour, into which 500 foreign ships enter yearly, is protected by two strong castles. The number of inhabitants was formerly 200,000, but the population has declined, and is now only 163,300. Among the principal buildings of the city are the palaces of the viceroy and of the archbishop, the great hospital, the convent of St Clara, the professed house of the Jesuits, the archi-episcopal cathedral, the council-house, and several splendid churches and gates of marble and alabaster. The two principal streets cross each other in the centre of the city, and form a regular octagon (the *piazza villena*,) which is embellished by handsome buildings. The streets are well paved and lighted. The university (*Accademia Reale*) has a respectable library, an observatory, and a cabinet of coins. There is also an academy of sciences in Palermo. The exports are almost all the productions of the island,—wine, oil, fruits, wheat, manna, &c.; the imports are colonial goods and manufactures. The silk of Palermo is cultivated in the neighbourhood, and chiefly exported raw. Palermo has frequently suffered from earthquakes, principally in 1726 and 1823. See *Sicily;* and *Naples and Sicily, Revolution of.*

PALES; one of the rural deities of Italy, the giver of good pasturage, and the protectress of the flocks from contagion and wild beasts. She was represented as a pastoral goddess, with a staff, and a crown on her head, and was worshipped, sometimes under the trees, sometimes in temples. Her festival was celebrated on the same day as the anniversary of the founding of Rome (April 21.) The offerings to her were milk and cakes. Some authors represent Pales as a male deity, the son of Jupiter.

PALESTINE (*Falesthin*,) called the *land of promise*, on account of the promise given to the posterity of Abraham, embraces the coast of Syria on the Mediterranean, from Lebanon south to the limits of Egypt, and was one of the most fertile countries of the old world. Wine, salt, wild honey, balsam, olives, dates, figs, and pomegranates, with large flocks and herds, were its productions. The alternation of mountain and valley, the temperate climate, the numerous streams, the rains of spring and autumn, caused its fertility. Its present barrenness arises from the inactivity of its inhabitants, who obtain their living either from the pilgrims, or as robbers. It was called, after the ancestor of its inhabitants, *Canaan*, when Abraham travelled into its southern provinces, and, by buying a burial-place for his family, laid the foundation for the subsequent conquest of the country by the Hebrews, under Joshua, 1450 B.C. They divided it into twelve confederate states, according to their tribes. Saul united it into one kingdom, and David extended it, by his conquests, to the east and south. Phœnicia, the northern part of the western coast, where the conquered Canaanites maintained themselves, remained entirely independent of the Hebrews. The two kingdoms, Israel (to the north) and Judah (to the south,) into which Palestine was divided, 975 B.C., comprehended together the country between 34° and 39° of longitude, and 31° and 34° of latitude. By the fall of these kingdoms (754 and 730 B.C.), Palestine became a Persian satrapy, and the political and religious division between the Hebrew colonies, when returning from captivity to Palestine, under Cyrus and Darius I., was the origin of that separation which continued to the time of Christ. The country on this side the Jordan (the principal river, which flows south from Lebanon, through the lake of Genesareth, to the Dead sea) was called *Judæa*, in a wider sense, and contained these provinces: Judæa, or the largest southern province, including Jerusalem, Bethlehem and Jericho on mount Judah, the ports of Cesarea and Joppa (now Jaffa,) on the coast of the Mediterranean, and a part of Idumæa; Samaria, or the smallest interior province, with the city of Samaria (afterwards *Sebaste*,) and Sichem now (from the Greek name *Neapolis*,) Nablus, and mount Ephraim, or Israel, upon which lies mount Gerizim; and Galilee, the most northern and fertile province, bounded on the south by mount Carmel and mount Tabor (which joins the other mountain,) on the confines of Samaria, on the west by Phœnicia, and on the north by Lebanon, and containing the towns of Tiberias (which, after the destruction of Jerusalem, was celebrated as the seat of Jewish learning,) Capernaum and Bethsaida on the lake of Genesareth, Nain, Nazareth, and Cana. To the country beyond the Jordan belonged the provinces of Peræa, the largest and most southerly, with mount Gilead, Gaulonitis, east of the lake of Genesareth, Batanea, and Trachonitis, the smallest in the north.

The different monuments at Jerusalem (see *Jerusalem*) give us the epochs of the history of Palestine. The Christian kingdom of Jerusalem, founded in 1099, by the crusaders, gave a new impulse to the prosperity of the Holy Land; it included the provinces on this side the Jordan, together with Phœnicia and Philistæa, and extended beyond the Jordan to the deserts of Arabia. Its constitution was European; a patriarchate, four archbishoprics, richly endowed monasteries, and ecclesiastical establishments, three orders of knighthood, several earldoms and baronies, were instituted; tribunals were formed for the nobles and the third estate; an army of from 12,000 to 20,000 men was kept on foot; and the mosque built by the caliph Omar in 637, upon the site of the temple of Solomon, was changed into a magnificent cathedral. The increasing population, with moderate taxes, a fruitful soil, and a favourable situation for commerce, appear to have secured to this kingdom prosperity and a long continuance. The kings, Godfrey of Bouillon (who died in 1100,) Baldwin, Anjou, and Lusignan, ruled with mildness, and fought with various success against the Saracens, whom the internal divisions of the reigning family, and the delay of succour from Europe, enabled to reconquer the kingdom. Saladin took Jerusalem in 1187, again made the cathedral a mosque, and the gold of the Syrian Christians alone preserved the church of the holy sepulchre. After a hundred years of oppression, the Christian rulers were at last, in 1291, entirely driven from Palestine by the Mamelukes. Since then, Palestine, laid waste by bands of Arabian robbers, has smarted under the rod of the Mohammedans, and now belongs to the pachalic of Damascus, in the Turkish province of Soristan.

Jerusalem, which has been sacked sixteen times, offers now but the shadow of its former greatness. The policy of the Turks, who raise a heavy contribution from the few pilgrims from Christian lands, who still visit this holy place, has not suffered the total decay of the monuments of the history of Jesus, which were designated during the Christian reigns in the twelfth century. Chateaubriand, in his Journal of a Journey from Paris to Jerusalem, declares that he saw, in the strongly fortified monastery at Bethlehem, a church divided among Roman catholic, Greek, and Armenian monks, with a subterraneous chapel; that it encloses the place where Jesus was born, his manger, and the grave of the innocents, and is adorned with beautiful pictures. In the neighbourhood of Jerusalem, the valley of Jehoshaphat, which extends between mount Moria and the mount of Olives, and is divided by the brook Kedron, is used as a burial-place by the inhabitants of Jerusalem. The garden of the mount of Olives, containing Gethsemane, the chapel of the sepulchre of the holy virgin, and the grotto of the bitter cup, has now a small mosque at the place of the ascension. Sion is a hill of a barren appearance and yellow colour; the house of Caiaphas (now an Armenian church,) the house of the preparation of the holy supper, and of the outpouring of the Holy Spirit (now a mosque with a Turkish hospital,) and the palace of David, are to be seen in ruins; to the southward, in the valley of Hinnom (Tophet,) is the field of blood and the burial-place of the kings; in the interior of the city is the *via dolorosa* (painful road,) through which Jesus walked to the cross; it is 500 paces in length, from the house of Pilate (now in ruins,) to the church of the holy sepulchre. This church, whose walls, according to the history of the crucifixion, enclose all the places remarkable for the burial and resurrection of Jesus, is 126 paces in length, and 70 in breadth. It is in the form of a cross, with three domes, and is built on uneven ground. Clergymen of eight nations and different Christian sects, possess it by turns, and perform in it public worship according to their respective forms:—Catholics (who are monks of St Francis, from the monastery of St Salvator in Jerusalem,) Greeks, Abyssinians, Copts, Armenians, Nestorians, and Jacobites, Georgians, and Maronites. The priests, who perform the service, and the monks of the different sects, commonly remain two months in the church, until their place is taken by others. Two hundred lamps burn day and night in the wide rooms of the building. Its walls, in which are seen the funeral monuments of Godfrey and Baldwin I., appear to have been standing since the time of Constantine the Great; the architecture of the interior is the work of the crusaders. This church was injured by fire, October 12, 1808. The chapel of the holy sepulchre remained uninjured, and the cupola, covered with lead, which fell at the time of the fire, has been replaced. Mr J. W. Ingraham, published at Boston (1828) Assheton's Map of Palestine, improved, with a geographical index.

PALESTRINA, GIOVANNI PIETRO ALOISIO, or PERLUIGI DA, the most celebrated master of the old Roman school of music, was born at Palestrina, the ancient Preneste, whence his surname, *Il Prenestino*. He studied music under a master of the Gallo-Belgic school, whom some call *Gaudimel*. His genius soon raised him to the first rank of musical composers, and effected a great reform in church music. Towards the middle of the sixteenth century, music was at so low an ebb, that pope Marcellus II. had already formed the plan of banishing it from the churches, when Palestrina, who had conceived juster notions of the true character of church music, obtained permission to execute one of his own compositions before him. He accordingly performed the mass for six voices, still known as the *Missa Papæ Marcelli*, the elevation and simple beauty of which led the pope to abandon his design. From that time music became an essential part of the service of the Catholic church. Marcellus and his successor, Paul IV., employed Palestrina to compose a number of similar pieces for their chapel. In 1562, he was made chapel-master of Santa Maria Maggiore, and, in 1571, of St Peter. To this period we owe his greatest productions. His style (called *alla Palestrina*) prevailed over the Flemish school, which was then in high repute throughout Europe. He died in 1594, and was buried with great pomp at the foot of the altar of St Simon and Juda, in St Peter's. His monument bears the inscription *Johannes Petrus Aloysius Palestrina, Musicæ Princeps*. Some of his pieces are still performed, particularly his *Fratres ego enim accepi*, with the *Stabat Mater* and the *Improperia*, in the Sistine chapel at Rome.

PALEY, WILLIAM, a celebrated divine and philosopher, was the son of a clergyman, who held a small living, near Peterborough, and was born in 1743. He was instructed under his father, who became master of a grammar school in Yorkshire, whence he was removed as a sizar to Christ-church college, Cambridge. He soon obtained a scholarship, and, in 1763, having highly distinguished himself as a disputant on questions of natural and moral philosophy, took his first degree. He was afterwards employed for three years as an assistant to an academy at Greenwich, and, in 1766, was elected a fellow of his college, and appointed one of its tutors. The lectures which he then delivered on the Greek Testament and on moral philosophy, contain the outlines of the works by which he subsequently obtained celebrity. In 1767, he took priest's orders, and maintained an intimate acquaintance with the most eminent persons in the university, who falling below the established standard of orthodoxy, Mr Paley began to be regarded with coolness by his zealous defenders. His friends could not, however, persuade him to sign the petition for relief in the subscription to the Articles, on which occasion he observed, that "he could not afford to keep a conscience." In 1776, he quitted the university, and was inducted into the vicarage of Dalston, in Cumberland, to which was soon after added the living of Appleby, and a prebendal stall in the cathedral of Carlisle. In 1782, he was appointed archdeacon of the diocese, and, not long afterwards, succeeded doctor Burn in the chancellorship, for all which preferments he was indebted to the bishop of Carlisle. In 1785, he published his Elements of Moral and Political Philosophy—a work of much simplicity and pertinence of illustration, but exceptionable in many of its definitions and principles, both in politics and morals. In 1787, Paley published his *Horæ Paulinæ*, the chief object of which is, to bring together, from the Acts of the Apostles, and the epistles, such passages as furnish examples of undesigned coincidence, and thus prove the authenticity of the scriptural writings. In 1794, he published his View of the Evidence of Christianity, in three parts, which contains a popular view of the arguments for the truth of the Christian religion, drawn up with his usual perspicuity and dialectic skill. He was soon after made a sub-dean of Lincoln, and received several valuable livings. In 1795, he was created D.D. by the university of Cambridge; and, his health not allowing him to officiate in the pulpit, he undertook the compilation of his natural Theology, or Evidences of the Existence and Attributes of the Deity, collected from the Appearances of Nature (8vo, 1802). He died in 1805. Doctor Paley was fond of amusement and company, and displayed much wit and humour. No man was more beloved by his friends, or evinced more attachment to them in return. Since his death, a volume of his sermons has been published in 8vo.

PALI. See *Indian Languages*.

PALIMPSESTS, re-written manuscripts (*codices rescripti*, from πάλιν and ψάω), have, in modern times, by the successful exertions of signor Maio (see *Codex* and *Maio*) to discover the contents of the original writings, greatly attracted the attention of philologists, and we may hope that the great collections of manuscripts at Rome, Naples, Oxford, Cambridge, &c., which have been little examined, will yet afford us many remains of ancient literature which have escaped the general wreck. On account of the dearness of writing materials in the time of the ancients, it was very natural that they should seek means for rendering serviceable, a second time, the parchment or Egyptian papyrus which had been already used. A preparation for effacing the original writing was known even in the time of Augustus. The writing upon parchment could be scratched out, and a peculiar kind of knife (*rasorium*) belonged to the apparatus of a transcriber. The parchment scratched in this manner, was rubbed with pumice stone to render it more fit for writing. Fortunately the original characters have often remained legible, so as to be visible to the naked eye, or to appear very plain with the assistance of chemical agents. As the transcribers in the middle ages, when the want of writing materials was felt, in consequence of the great demand for missals, &c., often divided the large sheets of written parchment, the second set of lines is sometimes found diagonal to the first, so that the old and new cross each other, or the old lines have remained above the others, as in the fragments of Ulphilas, the Phæton, &c. The increasing zeal in the search for remains of classic literature has directed the attention of learned men to these hidden treasures. Maio's discovery of Fronto, and the subsequent discovery of the fragments of the Phaeton of Euripides, and Cicero's books *De Republica*, Niebuhr's discovery of Gaius, together with the results of the labours of Peyron and others, have increased the interest of learned men in these investigations. See *Manuscripts*.

PALINDROMON; a verse or line which reads the same either forwards or backwards; e. g. that which is put in the mouth of Satan—*Signa te, signa, temere me tangis et angis* (cross thyself, cross thyself, you touch and torment me in vain); or, *Anna tenet mappam madidam, mulum tenet Olo.*

PALINGENESY; Greek for *regeneration*. The word is used to designate the transitions from one state into another, observed with insects, and in each of which the insect appears in a totally different form.

PALINODY; a recantation, particularly a poetical one, of any thing dishonourable or false uttered against another person. Thus the ancient poet Stesichorus wrote a *palinody* of his poetical invective against Helena, for which he had been punished by blindness, and declared all the charges contained therein untrue.

PALINURUS; pilot of Æneas in his voyage to Italy, and son of Jasius. According to the celebrated poem of Virgil, the god of sleep, under the form of Phorbas, sealed his eyes in slumber, and threw him into the sea, at the very moment when the ship was reaching the desired shore. Æneas saw his lost companion, when the shades of the lower world passed before his eyes, and Palinurus related to him how he had been saved from the water, but slain by the Lucanians, on the southern coast of Italy. The Lucanians, being afterwards tormented by a pestilence, raised a monument to his honour, to pacify his manes, and consecrated a grove to him. Mount Palinurus was named after him.

PALISADES; stakes, eight or nine feet long, and six or seven inches square, and sharpened at the end, which are set in the ground either perpendicularly or obliquely, for the greater security of a fortification, particularly for the closing up of an open passage to the works, or the protection of any exposed point, previous to an attack.

PALISOT DE BEAUVAIS, AMBROISE MARIE FRANCOIS JOSEPH; an eminent naturalist, born at Arras, in the French Netherlands, in 1752. He studied at the college of Harcourt, at Paris, and, in 1772, was admitted a counsellor of the parliament of that city. Some time after, he succeeded his elder brother as receiver-general of territorial imposts, which office was suppressed in 1777. He then devoted his attention entirely to natural history, and especially botany, and, in 1781, became a corresponding member of the Parisian academy of sciences, to which he addressed several memoirs on botany and vegetable physiology. The love of science induced him to undertake a voyage to the coast of Guinea, with an intention to travel across the African continent to Egypt; but he was unable to execute that design, and, after remaining some time at Owara and Benin, he sailed for St Domingo, and arrived at cape François, in June, 1788. He continued there some years, occupying official situations in the colony; but his opposition to the revolutionary attempts of the negroes having endangered his safety, he with difficulty effected his escape to Philadelphia, in the United States of America. Thence he proposed to return to France, when he learned that he had been proscribed as an emigrant. He was obliged to support himself as a teacher of languages, and by exercising his talents as a musician, till the arrival of the French minister Adet, who was himself a man of science, and who afforded Palisot the means of prosecuting inquiries into the natural history of America. He was employed to arrange Peale's collection, and made scientific tours to the Appalachian mountains and the country beyond. At length, he received the news of his name being erased from the list of emigrants, and returned to his native country, taking with him the rich collection of natural curiosities which he had formed. In 1806, he was admitted into the institute in the room of Adanson; and he became a member of other learned societies. He died January 21, 1820. Among his principal work are *Flore d'Oware et de Bénin* (Paris. 1804—21, 2 vols., folio); *Insectes recueillis en Afrique et en Amérique* (1805—21, folio); *Essai d'une nouvelle Agrostographie, ou Nouveaux Genres des Graminées* (1812, 4to and 8vo); all which are illustrated by engravings.

PALLA; a long garment of the Roman women, which hung down to the feet, and was worn over the other dress. When long enough, they threw part of it over the left shoulder, and held it fast under the arm. At funerals it was black. Tragic actors also wore the *palla*.

PALLADIO, Andrea; one of the greatest classical architects of modern Italy, whose works of art and writings alike contributed to improve the taste of the age in which he lived, and direct the genius of posterity. He was born at Vicenza, in the Venetian territory, in 1518, and, after having studied under Trissino, he went to Rome, where he acquired a maturity of skill and science from an examination of the productions of ancient and modern art which that capital afforded. Returning to his native country, he established his fame by his designs for many noble edifices both there and in other parts of Italy, which have afforded models for some beautiful structures in England, as well as other parts of Europe. Palladio belongs to the masters who, in the sixteenth century, by the study of the works of Roman architecture, created a new era in architecture. Among many splendid works executed from his designs and under his direction, the theatre *degli Olimpici*, in his native place, is the most brilliant proof of his talents. Venice also owes to him many of her finest buildings. The villa built by lord Burlington at Cheswick (but since enlarged by James Wyatt) was from a design of Palladio, as was also a bridge at Wilton, the seat of the earl of Pembroke, in Wiltshire. The majestic simplicity of antiquity was always present to his mind, and Algarotti called him the Raphael of architects. But this great architect is best known in the present age on account of his published works, especially his Treatise on Architecture, in four books, which first appeared in a folio volume, at Venice, in 1570, and has been many times reprinted. The best edition is that of Vicenza, 1776—83, 4 vols. It has also been translated into French and English. James Leoni, an Italian architect, published Palladio's Architecture in English, with the notes and remarks of Inigo Jones, and engravings by Picart (London, 1742, 2 vols., folio); and some of the designs of this architect were published by lord Burlington in 1730. Palladio was likewise the author of an Italian work on the antiquities of Rome (Venice, 1594, and Rome, 1599, 8vo), and of Illustrations of the Commentaries of Cæsar. He died at Vicenza, in 1580. Chapuy and Amed. Beugnot have published Palladio's *Œuvres Complètes*, with plates and notes, at Paris 1827 seq., in 20 numbers, folio. See Remanza's *Lives of Venetian Architects and Sculptors*.

PALLADIUM; a wooden image of Minerva (*Pallas*), which is said to have fallen from heaven, and to have been found by Ilus, who placed it in a temple in his new city (Ilium). It was believed be the Trojans, that their city would be invincible so long as it contained the Palladium. Ulysses and Diomedes, to remove this impediment to the capture of the city, are said to have carried it off. The Romans, however, pretended that it was brought to Italy by Æneas, and preserved in the temple of Vesta, at Rome. It was considered so holy, that even the *pontifex maximus* did not dare to look upon it. Other cities, however, claimed to have possession of it. The term *palladium* has figuratively acquired the sense of *bulwark, protection, sanctuary*.

PALLADIUM; the name of a metal discovered by doctor Wollaston, associated with platina ore, among whose grains it exists alloyed with iridium and osmium, in grains still more minute than those of the platina. The process of separating it from the substances with which it occurs, is too long to be detailed here, and must be sought in the larger chemical treatises. When pure, it is of a grayish white colour, and is scarcely distinguishable from platina. It is ductile and very malleable; in hardness, superior to wrought iron, and possessed of a specific gravity of 11·8. It is a less perfect conductor of caloric than most metals, and less expansible, though in this it exceeds platina. On exposure to a strong heat, its surface undergoes a tarnish, and becomes blue. Its melting point is higher that that of gold; but if touched, while hot, with a small piece of sulphur, it runs like zinc. The sulphuret thus formed is whiter than the metal itself, and extremely brittle. Nitric acid soon acquires a fine red colour from palladium, but the quantity which it dissolves is small. Sulphuric and muriatic acid act in a similar manner. Nitro-muriatic acid, however, dissolves it rapidly, and assumes a deep red colour. Alkalies and earths throw down a precipitate from its solutions, generally of a fine orange colour. Alkalies act on palladium even in the metallic state; the contact of air, however, promotes their action. A neutralized solution of palladium is precipitated of a dark orange or brown, by a recent muriate of tin; but if it be in such proportions as to remain transparent, it is changed to a beautiful emerald-green Green sulphate of iron precipitates palladium in a metallic state. Sulphureted hydrogen produces a dark-brown precipitate; prussiate of potash, an olive-coloured one; and prussiate of mercury, a yellowish-white. As the last does not precipitate platina, it is a good test of palladium. This precipitate is from a neutral solution in nitric acid, and detonates at about 500° Fahr., in a manner similar to gunpowder. All the metals, except gold, silver, and platina, precipitate it in the metallic state.

PALLAS, Peter Simon, imperial Russian counsellor, celebrated for his travels, particularly in that empire, and for his numerous observations and discoveries made there, born at Berlin, 1741, was the son of a physician, and chose the study of medicine, with the purpose of devoting himself only to the natural sciences, particularly to natural history. For this object, Holland then offered the largest collections and the best instructers. He therefore went to Leyden, and published there, in 1760, his dissertations on the Entozoa. He afforded important aid to Volkmann, who was arranging the splendid collection of natural curiosities in the Hague, belonging to the stadtholder, and became so skilful in the art of arranging and describing collections of natural history, that, after he had visited Britain, he was employed in superintending the arrangement of cabinets in this department, and was thus enabled to publish his *Elenchus Zoophytorum* (still a classical work on zoophytes) and his *Miscellanea Zoologica* (1760). He then returned to Berlin, and began to publish his *Spicilegia Zoologica*, which reached its fourteenth number. The empress Catharine was at that time seeking for a naturalist to explore her immense empire. In 1768, Pallas was invited to Petersburg as academician, and performed his first journey through several provinces of Russia, the Journal of which was published at the expense of the empress (Petersburg, 1771—76, 4to.). In 1777, he became a member of the committee for the measurement and topography of the Russian empire. In the mean time, botany had become his favourite study, and he made several excursions into various provinces of the empire to examine their plants. The magnificent *Flora Rossica*, begun at Petersburg in the early part of 1785, but afterwards dropped, was the first fruit of these botanical tours. No part, indeed, of the history of nature or man was untouched by him, as is manifest from his Historical Collections; his New Essays on the North; his excellent *Icones Insectorum*, and his Contributions to the Glossary of all the Languages and Dialects of the Russian Empire. In 1785, he was made a member of the imperial academy of sciences at Petersburg, and knight of the order of Wladimir, and, in 1787, historiographer to the admiralty college. As it was his desire to reside in Taurida, the empress gave him several estates in the most fertile portion of the south of the peninsula, and, after 1796, Pallas lived at Sympheropol with a large income. One of the fruits of his last journey, which he undertook with Geisler, of Leipsic, at his own expense, was the work entitled Remarks on a Journey through the Southern Governments of Russia (Leipsic, 1799 and 1801, 2 vols., 4to). The second part of this book is devoted exclusively to the Crimea, which was thus first completely laid open to us. Besides fourteen numbers of the *Species Astragalorum*, which may be regarded as a monument of that journey, we will mention, on account of its interesting views, his *Observations sur la Formation des Montagnes et les Changemens arrivés au Globe, particulièrement à l'Egard de l'Empire Russe.* The residence of Pallas in Taurida was disturbed by the lawlessness of the natives. Soon after the death of his wife, he made great sacrifices to visit an elder brother at Berlin, where he died, Sept. 8, 1811. A part of his valuable collections he bequeathed to the university of Berlin.

PALLAS. See *Minerva* and *Planets*.

PALLET; among painters, a little oval tablet, or piece of wood or ivory, very thin and smooth, on and round which the painters place the several colours they have occasion for, to be ready for the pencl. The middle serves to mix the colours on and to make the tints required in the work. It has no handle, but instead thereof a hole at one end to put the thumb through to hold it.

PALLIUM, or PALL; the woollen mantle which the Roman emperors were accustomed, from the fourth century, to send to the patriarchs and primates of the empire, and which was worn as a mark of ecclesiastical dignity. The annexed cut represents one in the costume of a pallium. In the fifth century, the patriarchs, with the consent of the emperors, began to send the pall to the archbishops, on their entrance into their dignity, and they were obliged to wear it while discharging the higher functions of their office. It became customary, however, to regard the giving of the pallium to archbishops as a sign that their election was confirmed by the patriarchs; and the council of Constantinople, in 872, decreed that all archbishops should be confirmed by their patriarchs, either by the imposition of hands, or by the sending of the pall. The popes possessed themselves of the right of confirmation in the West, and, at first, required of the archbishop, who was invested with the pall, only a written promise of canonical obedience to the papal see; but, from the tenth century, exacted a considerable tax on investiture. Notwithstanding the great increase of this tax, the pallium was, until lately, regarded as an indispensable mark of confirmation by the pope, and was sent to every archbishop, and to some of the principal bishops, when entering upon their office. Since the twelfth century, it has consisted of a white woollen band or fillet, three or four fingers broad, which is thrown over the shoulders outside of the sacerdotal vestments; one band hanging over the back, and another, somewhat longer, over the breast, and both are ornamented with a red chaplet. This ornament, as simple as it is costly (a sum from three to four thousand pounds was sometimes paid for it), is made by the nuns in the convent of St Agnes in Rome, from the wool of consecrated sheep, and is buried with its wearer.

PALL MALL. See *Mall*.

PALM, John Philip, a citizen and bookseller of Nuremberg, whom we mention because his fate contributed not a little to increase the hatred of the Germans against the French, and to sharpen their weapons against Napoleon at a later period. Palm was born in 1766. In the year 1806, his establishment sent to various other bookselling houses a pamphlet, entitled Germany in her deepest Humiliation, on the whole a superficial work, but containing bitter attacks on Napoleon and his troops in Bavaria. Palm asserted, to the last moment of his life, that he had no knowledge of the work, which was sent to him to be forwarded, as is customary in Germany. The police of Napoleon, which was spread all over Germany, learned the fact that Palm had forwarded it. He requested a judicial investigation from the authorities at Nuremberg, but it was refused. Being afterwards at Munich, he received information from his wife that he was prosecuted. Though he might have fled, he returned to Nuremberg. He now, however, found it necessary to conceal himself. A beggar boy appeared at his house, and requested to see him in order to get alms. Palm gave him something, and immediately French *gens d'armes* entered and seized him. Soon after, he was carried to general Bernadotte, in Anspach, where a trial was again refused, because, as the aid-de-camp of the marshal said, his arrest was the consequence of a direct order from Paris. He was sent to Braunau. Berthier declared that nothing could be done for him, though the most respectable people interfered for him. The process was hurried, no counsel allowed to Palm, though the sentence states the contrary, and the whole trial was carried on by an interpreter. The unhappy man was condemned to death, because he could not say who had sent the parcel containing the pamphlet, in which, however, no call for insurrection or assassination was to be found. He expected the news of his liberation, when his door was opened, August 26; but it was to announce to him the order for his execution. St Hilaire declared that none could pardon but the emperor himself, if he were present; he, it was said, had ordered the immediate execution of the sentence. Officers of high rank, however, have declared, that not Napoleon, but Berthier, is chargeable with this outrage. It had been proved that Palm had not sold one copy of the pamphlet. Palm was not the only German shot after hasty military trials ordered by the French marshals.

PALM; an ancient long measure, taken from the extent of the hand. The Roman palm was of two kinds. The *great palm*, taken from the length of the hand, answered to our *span*, and contained twelve digits or fingers' breadths, or nine Roman inches, equal to about eight and a half English inches. The *small palm*, from the breadth of the hand, contained four digits or fingers, equal to about three English inches. The Greek *palm*, or *doron*, was also of two kinds: the *small* contained four fingers, equal to little more than three inches: the *great palm* contained five fingers. The Greek *double palm*, called *dichas*, was large also in proportion. The modern *palm* is different in different places where it is used. It contains, at Rome, eight inches three and a half lines; at Naples, according to Riccioli, eight inches: according to others, eight inches seven lines; at Genoa, nine inches nine lines; at Morocco and Fez, seven inches two lines; in Languedoc, and some other parts of France, nine inches nine lines: the English palm is three inches.

PALM, the tree. See *Palms*.

PALMA, GIACOMO, surnamed *Vecchio* (the old), a pupil of Titian, and one of the most famous painters of the sixteenth century, was born at Bergamo, in 1518, and died between 1564 and 1574, at Venice, which possesses excellent pictures by him (e. g. the St Barbara).

PALMA. See *Canaries*.

PALMA. See *Majorca*.

PALMA CHRISTI; a name frequently applied to the castor oil plant.

PALMETTO. In the Southern States of America, this name is frequently given to the cabbage-tree, a species of palm, growing along the Atlantic coast from about lat. 35° to the extremity of Florida. It attains the height of forty or fifty feet, and is by far the tallest, as well as the most northern, of our palms. The summit of the stem is crowned with a tuft of large palmated leaves, varying in length and breadth from one to five feet, and supported on long foot-stalks, which give it a beautiful and majestic appearance. Before these leaves are developed, they are folded like a fan; at their base and in the centre of the stem are three or four ounces of a white, compact, and tender substance, which is eaten with oil and vinegar, and somewhat resembles the cabbage in taste, but is neither highly nutritious nor peculiarly agreeable, and, moreover, is attended with the destruction of a vegetable which has perhaps been a century in growing. The flowers are small, greenish, disposed in long clusters, and are succeeded by a black inesculent fruit, about as large as a pea. The cabbage-palm in the United States appears to be confined to the immediate vicinity of the sea. Michaux, however, mentions two stocks observed by him in Florida, at the distance of forty or fifty miles in the interior. The same author met with it in Bermuda, and supposed it to be found in the Bahamas and along the shore of the gulf of Mexico; but it is unknown in Louisiana, and is not found beyond the limits of the United States. The wood, though extremely porous, in the Southern States is preferred to every other for the construction of wharves, on account of its being secure from the attacks of sea-worms; and has been found peculiarly suitable for the construction of forts, as it closes, without splitting, on the passage of a ball. The slowness of its growth will always discourage its propagation.

PALMS; a natural family of plants, the pride of tropical climates, and which, more than any other, contributes to give a peculiar and imposing character to the vegetation of those regions. Their lofty, straight, and unbranching trunks, crowned at the summit by a tuft of large radiating leaves, gives them an aspect entirely unique, and far surpassing that of other trees in majesty. Aside from the grandeur of their appearance, many of them hardly yield to any other vegetables in useful properties. The species are numerous, but are not well understood; and many fruits exist in collections which cannot be referred to known genera. They belong to the monocotyledonous division of plants, and have their parts arranged in threes, or one of the multiples of that number. The calyx has six divisions, more or less profound; the stamens are six in number; and the fruit consists of a berry or drupe, composed of a substance sometimes hard and scaly, but more often fleshy or fibrous, surrounding three, or, usually, a single, one-seeded nut. The stem is simple, or very rarely branching, and is sustained by a mass of fibrous roots at the base. Though usually attaining the stature of a tree, and sometimes ascending to a very great height, in some species, the stem rises only a few inches above the surface of the ground. This stem is cylindrical, but, internally, the fibres are arranged in fascicles, and not in concentric circles, as with trees generally. The centre is soft, while the circumference is firm and hard like horn. In these respects, the palms are analogous to other monocotyledonous vegetables. This stem is covered externally with the sheaths of the fallen leaves, or with their cicatrices, and is terminated by a tuft of pinnate or flabelliform leaves. From the midst of these arises a simple or branching spadix, on which the numerous small flowers are disposed, and which at first is enveloped in one or several spathæ, or sheaths.—Many of the palms appear to be confined within narrow limits, and it has been remarked that, whenever a district is characterized by striking peculiarities of soil or climate, it appears to be inhabited by peculiar species. All the palms are not strictly confined within the tropics, but a few inhabit the warm regions on their borders. Among the more useful of the palms may be mentioned the cocoa-nut, the sago, and the date.

PALMS, ORDER OF. See *Fruit-bearing Society*.

PALM SUNDAY; the last Sunday before Easter, on which Christ's entry into Jerusalem, when palms were strewed before him, is celebrated. Formerly, a wooden ass, with the figure of Christ on it, was drawn on rollers in procession, because Christ entered Jerusalem on an ass. It is still celebrated with much solemnity by the Catholics, and branches are strewed in the churches.

PALMYRA; a Syrian city, famous in ancient times, capital of Palmyrene, which for a short time formed a powerful state. It was at an early period called *Tadmor* (the city of palms), of which the Latin name is a translation. The origin of this city is of remote antiquity. It was important as the bulwark of Judæa against the wandering tribes from the Euphrates; and, as the emporium of the commerce of Eastern and Western Asia, it was a large and opulent city in the time of Trajan, who subjected the whole province to the Roman power. It was situated in a valley with a southern exposure, in the midst of a beautiful palm grove in the desert. It was adorned with magnificent palaces, whose ruins, though it has been twice destroyed, still excite admiration. It was sacked for the first time under the reign of the celebrated Zenobia, by the emperor Aurelian, in 275, and a second time by the Saracens, in 744. In the middle of the eighteenth century, the ruins were discovered by Wood and Dawkins, and described in the magnificent work of Wood, the Ruins of Palmyra. Among the ruins are a great number of beautiful columns, ruins of temples and towers, all admirably wrought of marble. Many Greek and Palmyrene inscriptions, and one in Latin, increase their value. The most beautiful monument is a temple of the sun, which is also in the best preservation. Palmyra, under its old name (Tadmor), is now a village in the desert of Syria, and some poor families have built their huts amidst its magnificent ruins.—See St Martin's *Histoire de Palmyre* (Paris, 1823).

PALOMINO DE VALASCO, ACISCLE ANTONIO, one of the most distinguished painters of Spain, was born at Bajalance, near Cordova, in 1653. He studied in the latter place, but, as his inclination led him to cultivate the arts, he placed himself under the painter Valdes. In 1678, he went to Madrid, where, in the reign of Philip IV., many distinguished artists resided. Palomino was presented to the king by the celebrated Coello, and was employed by the former to execute the frescoes in the gallery del Cierzo in the Prado. This commission he executed with so much success, that he was appointed court-painter, with a considerable pension. In Valencia, Salamanca, Granada, and Cordova, to which he was successively invited, he executed numerous works which were highly esteemed. His son assisted him in some of his productions. It has been objected to Palomino that his figures, even in his most elevated compositions, partake too much of the character of common life; but his colouring and perspective are admirable. He died at Madrid in 1726. He is the author of a history of Spanish painters, *El Museo pictorico, y Escala optica* (3 vols., Madrid), of which the third volume, containing an account of the most distinguished Spanish artists, has been translated into French (Paris, 1742). Quilliet, in his *Dictionnaire des Peintres Espagnols* (Paris, 1816), borrows much from Palomino.

PALOS; a small town of Andalusia, in Spain, where Columbus fitted out his ships, and whence he sailed, on his first voyage for the discovery of the new world, in 1492. Here, also, is the convent, at the gate of which Columbus appeared as a poor stranger, and asked bread and water for his child. It is now almost deserted, being occupied by a few hundred inhabitants. It lies on the Tinto; lon. 6° 58′ W.; lat. 37° 10′ N. See Irving's interesting account of his pilgrimage to Palos, in company with a descendant of the Pinzon family, in the appendix to his *Voyages of the Companions of Columbus*.

PALSY, PARALYSIS; a nervous disease, known by the loss or diminution of the power of voluntary motion, and sometimes of sensation, in one or several parts of the body. (See *Nervous Diseases*.) It appears under different forms; sometimes it attacks the whole system; at others, it affects one side of the body (*hemiplegia*), and at others a single member. The causes of palsy are numerous, but their mode of action is not clearly ascertained. The action of cold on the body in a heated state, a violent physical or moral excitement, or the suppression of an ordinary evacuation, sometimes produces it. The introduction of metallic substances, particularly lead or copper, into the system, often brings on incurable palsy. The paralysis of the vital organs is attended with immediate death; and, when the head is attacked, the memory and judgment are often impaired.

PALUS MÆOTIS. See *Azoph*.

PAMLICO, called also TAR RIVER, in North Carolina, passes by Tarborough, Greenville, and Washington, and runs south-east into Pamlico sound; lat. 35° 22′ N. It is navigable, for vessels drawing nine feet of water, to Washington, forty miles, and for boats carrying thirty or forty hogsheads of tobacco to Tarborough, ninety miles.

PAMLICO SOUND; a large bay on the coast of North Carolina, eighty-six miles long and from ten to twenty broad. It is separated from the sea by a sandy beach, hardly a mile wide, which is covered with bushes. It communicates with Albemarle sound. Ocracoke is its principal outlet.

PAMPAS; vast plains in the southern part of Buenos Ayres, extending from the de la Plata nearly to the Andes, 750 miles in length by 450 in breadth. A part is covered with grass, affording excellent pasturage; and another portion, at the foot of the Andes, forms an immense forest, which, however, is easily passable in all directions. Herds of horses and cattle, in a wild state, feed in these wide plains. Several beasts of prey infest them, and the bisacho, a small animal, burrows like the rabbit. The inhabitants are the Gauchos, who are of Spanish origin, but who lead a life of wild independence, living on horseback, eating nothing but jerked beef, and drinking nothing but water, hospitable and generous to the traveller, and professing the Catholic religion; and, to the south, fierce tribes of mounted Indians, who lead much the same kind of life as the Gauchos, with whom they are perpetually at war. Armed with his *lasso*, or leather strap, the Gaucho, or pampas Indian, rides on horseback, and, with great dexterity, throws it round the neck of a wild horse, bull, or other animal which he wishes to take, by a sudden jerk, throws the animal to the ground, and gallops off with his booty. There is a route across the pampas from Buenos Ayres to Chile, on which is a chain of cabins, called *posts*, seven or eight leagues distant from each other. The journey is performed on horseback, or in a wheeled carriage; but it is difficult, and rendered dangerous by robbers and the Indians.

The *pamperos* are violent winds from the west or south-west, which sweep over the pampas, and often do much injury on the coasts. Head's amusing Journey across the Pampas (London, 1826) gives a very spirited and picturesque account of his gallop through this immense wilderness of grass and water.

Pampas del Sacramento are vast plains, similar to those above described (about 60,000 square miles), in the northern part of Peru. They abound in vegetable productions, but are infested with troublesome or dangerous insects and reptiles. They are inhabited by different native tribes. See *Llano*.

PAMPHLET. There are several derivations of this word, most of which are much strained. The most probable is that which considers it as coming from the phrase *par un filet* (on a thread), whence the word is written, anciently, and by Caxton, *paunflet*, properly denoting a book sold unbound, and only stitched, as the French *brochure*. The German *Flugschrift* (fugitive publications) is more significant. Pamphlets are not of recent origin; they were early used under the name of *libelli*, in religious controversies. They are generally intended for immediate effect. Political pamphlets may be considered as the shells used in party warfare, while newspapers more resemble the common weapons. They generally bear the imprint of the excited spirit of the time. When their object is scientific or religious, they exhibit that sort of information on these subjects which it was thought expedient to present immediately to the public. They are of great interest to the historian, but like newspapers, he must use them with great caution. It is highly important that public libraries should collect and preserve such publications; otherwise they are generally lost. Myles Davies has written an *Icon Libellorum*, or a critical history of pamphlets. See also, D'Israeli's *Curiosities of Literature*.

PAMPLONA, or PAMPELUNA (anciently *Pompelo*, or *Pompeiopolis*); a city of Spain, and capital of Navarre, situated on the Arga, in a plain near the Pyrenees, founded by Pompey; 78 miles north-west of Saragossa, 172 north-east of Madrid; lon. 1° 41′ W.; lat. 42° 50′ N.; population, 14,054. The town is strongly fortified, surrounded by walls, and has two castles, a cathedral, thirteen monasteries, four hospitals, and a college. It is situated in a fertile and well cultivated country, but has few manufactures. It was taken by general Lauriston (q. v) in 1823.

PAN; an Arcadian rural divinity, son of Hermes and a nymph, or of Penelope. He is represented as old, with a crooked nose, two horns, pointed ears, a goat's beard, goat's tail, and goat's feet with a pipe (see *Syrinx*), and carrying a crooked shepherd's staff. He was first worshipped at Athens, after the battle of Marathon, in which it was pretended that he had assisted the Athenians. This shepherd god was afterwards made the all-supporting god of nature, and personified the universe (το παν; compare Servius on Virgil, eclogue ii. 31). He was also introduced into the earlier fables, as in that of the battle of the Titans. He distinguished himself in musical contests, and by playing on the pipe, which he invented, and with which he contended for the prize with Apollo. (See *Syrinx*.) Some appear to have honoured him also as the inventor of the flute of reeds. Pan is the protector of the herds at pasture, of wild beasts, of fishes, and takes care of the bees of the husbandman, on which account, milk and honey were offered to him. Evander is said to have introduced his worship into Italy. He was here considered as corresponding to Faunus, and several festivals were celebrated in his honour, as the Lupercalia, in honour of Pan Lupercus, the protector against wolves. From Pan comes the expression *panic fear*. According to Plutarch, it was the Pans and Satyrs dwelling at Chemnos who first announced the death of Osiris, and thereby caused so much terror that, since then, every sudden, groundless fear has been called *panic*. According to Polyænus, Pan saved the army of Bacchus from great danger by a wild scream, a thousand times repeated by the echoes of the woods and rocks. In the battle of the Titans, Pan terrified the enemy by blowing in a sea conch. The ancients believed that great armies were often struck during the night with a sudden terror, caused by some god or demon to punish presumption.

PANACEA; a daughter of Esculapius; the goddess of healing. She is an allegorical creation of poets and artists. Her name (Πανακεια) signifies the "all-healing;" hence *panacea*, a universal remedy.

PANAGIA; the Greek name for the picture of the Holy Virgin, of which the Greek Catholics have one in every house, on board of vessels, &c., before which candles are kept burning.

PANAMA; a city of Colombia, capital of the department of the Isthmus (New Grenada), on the bay of the same name; lat. 8° 58′ N.; lon. 79° 27′ W.; population, 20,000. It contains a college, numerous churches and monasteries, a cathedral, an hospital, &c. The roadstead is exposed to violent north winds, and the bay is so shallow that ships are obliged to remain several miles below the town, and discharge by flat-bottomed boats. The commerce, however, is considerable, principally with the British of Jamaica, and the North Americans. The pearl fishery furnishes a yearly export to the value of above £9,000. The commerce of Panama was very flourishing while the Spanish intercourse with South America was carried on in the galleons; but it has since declined. The climate is unhealthy, and the heat excessive. See *Congress*.

PANAMA, Congress of. See *Congress*.

PANAMA, Isthmus of. The result of a series of levelings, carried across the isthmus in 1829, by Messrs Lloyd and Falmark, in the employ of the Colombian government, enables us to correct some statements in the article *Darien*. From the account of Mr Lloyd, communicated to the royal society in 1830, it appears that, in the narrowest part of the isthmus, there is a break of several miles in the great chain of the Andes, particularly between Chagres and Chame, where there are extensive plains, not more than 300—500 feet in height. After 935 pair of levelings from Panama to La Bruja, near the mouth of the Chagres, it was found that high water mark in the pacific is 13.55 feet higher than in the Atlantic, but that, at half-tide, the level of the Pacific is the same with that of the Atlantic; and, at low tide, is several feet lower. These circumstances induced the Colombian government to conceive the plan of a canal from Panama to Puerto Velo, on the Atlantic side, which has a large and secure harbour, and is distant forty-three miles north-north-west from Panama. A railroad between the two cities is already in progress.

PANARD, Charles Francis; a French poet, born about 1690, at Courville, near Chartres, where he had a trifling employment, and lived some time in obscurity, until the comedian Le Grand, having seen some of his pieces, encouraged him to write for the stage, in which department he became very successful. Marmontel calls him the "La Fontaine of the Vaudeville," both from the *naïveté* of his writing and the simplicity of his character. His works are occasionally incorrect and negligent; but they are always stamped with nature, sentiment, wit, and good sense. He knew perfectly well how to sharpen the point of an epigram; but his satire was always directed to the vice, not to the person. He died in 1755. His works were printed in four volumes, 12mo, entitled *Théâtre et Œuvres diverses*

PANATHENÆA; a festival celebrated at Athens, in honour of its tutelary deity, Minerva. Ericthonius, who instituted it (according to some, Orpheus was the founder), called it *Athenæa;* but, when Theseus united the inhabitants of twelve districts into a city, the festival received the name *panathenæa* (from παν, universal), because it was thenceforth solemnized by all the tribes of Athens. The *panathenæa* were distinguished into the greater and the less, in both of which three kinds of games were exhibited, conducted by ten presidents (*athlothetæ*). On the first day were races with torches in the Ceramicus; on the second, gymnical exercises, and imitations of naval fights; on the third contests of music and declamation, and dramatic representations. An olive crown from the groves of Academus, and a vessel full of the finest oil, were the rewards of the victor. Then followed the sacrifices, and the sacrificial feast. The greater *panathenæa* were distinguished from the less not only by their greater splendour and longer continuance, but particularly by the solemn procession, in which the *peplus*, a sacred garment, consecrated by young virgins, and made of white wool, and adorned with gold embroidery, representing the battle of the giants, was carried from the Acropolis into the temple of the goddess, whose ivory statue was covered with it. The *peplus* was also used in the *panathenæa* as the sail of a ship, which was moved through the streets by secret machinery, and accompanied by a solemn procession. This festival was so holy, that criminals were released from the prisons on the occasion of its celebration, and gold crowns were conferred on men of distinguished merit.

PANCKOUCKE, Andrew Joseph; a bookseller at Lisle, in Flanders, where he died in 1753, aged fifty-two. He was the author of several popular and useful compilations, and some original works.

PANCKOUCKE, Charles Joseph, son of the preceding, was also a bookseller, and a man of letters. He was born at Lisle in 1736, and, at the age of twenty-eight, settled at Paris, previously to which period, he had made himself known by some publications from the press, and mathematical pieces, which he had sent to the academy of sciences. His house became the resort of the most distinguished authors; and he conducted himself with great liberality to those with whom he was connected in his literary enterprises. He engaged in the publication of the *Mercure de France*, and various other periodical works, and established the *Moniteur*, under the direction of H. B. Maret, since duke of Bassano. He also formed the plan of the *Encyclopédie Méthodique*, consisting of a number of distinct dictionaries of the various branches of art, science, and literature, of which ninety parts had been published in 1822. Panckoucke died December 19, 1798. He was the author of *De l'Homme et de la Reproduction des differents Individus* (1761, 12mo); *Traduction Libre de Lucrèce* (1768, 2 vols., 12mo); and other works.

PANCRAS; one of the many villages which have, in course of time, become part of London; one mile and a half north of London Proper. In its well-known burial-place for Catholics, lie Paoli, the chevalier D'Eon (q. v.), Cavallo, Woollet, &c.

PANCRATIUM; one of the contests of the ancient Greeks, in which all four kinds of fighting were used (see *Gymnasium*); also a contest in which no means of obtaining the victory were left untried, where the antagonists both wrestled and fought with the fist; also a fight for life and death.

PANDÆMONIUM; a general temple for the gods and demigods of antiquity; an assembly of demons.

PANDECTS (from παν, every thing, and δεχεσθαι, to include); a part of the *corpus juris civilis*. It consists of a collection, systematically arranged, from the works of Roman lawyers on jurisprudence, to which the emperor Justinian (by whose command the collection was made) gave the force of law, A. D. 533, at the same time declaring all the writings of the jurists, and collections of the law, which had previously been authorities, of no force. They were also called *digesta* (from *digerere*, to arrange), because they were a collection of the scattered contents of many works. See *Civil Law*.

PANDEMOS; a Grecian surname of Venus. According to some authors, Theseus introduced the worship of Venus Pandemos at Athens, when he first collected into one whole the different tribes (δημοι) of Attica. According to others, this surname arose from the circumstance that the temple of Venus was situated in the market, the place of assembly of the whole people (παντος δημου); according to others, still, because Solon built this temple with the money which the public girls were obliged to pay. But Venus was worshipped under this name in other places at an early period. The image of Venus Pandemos at Elis, riding upon a he-goat, by the side of that of Venus Urania, is worthy of notice. Venus Pandemos here appears in opposition to celestial love, as a symbol of prostitution.

PANDIT, in Hindoostan; a learned Brahmin; one versed in the Sanscrit language, and in the sciences, laws, and religion of the country.

PANDOORS; the name formerly given to the Servian or Raitzian foot-soldiers, coming from the mountains in the neighbourhood of the village Pandur, in the county of Sol, in Lower Hungary. They were at first irregular troops. In 1750, they were made regular troops. They were formerly dreaded for their savage mode of warfare.

PANDORA (from παν, every, δωρον, gift); the first woman; so called because she received gifts from all the Olympians. Prometheus, driven from Olympus by Jupiter, had formed man, and animated him with fire stolen from heaven. The indignant father of the gods determined to punish the offence. He commanded Vulcan to form a woman of clay, equal to the goddesses in beauty and grace, and to give her life and the power of speech. The god executed the command. According to other accounts, she was the creature of Prometheus, and the gods came down to see her, and conferred their gifts on her. Minerva instructed her in all works of female skill. Venus endowed her with beauty and fascination. Mercury inspired her with a desire of pleasing, and taught insinuating words. Minerva carried her thus equipped into the assembly of the gods, and all admired the work. Jupiter, who presented to her a box or a chest, in which were contained all human woes, then sent Mercury to Epimetheus, the brother of Prometheus, with the fatal present. Prometheus had warned him not to receive any of Jupiter's gifts; but the charms of the virgin overcame his caution. Till that time, man had lived free from evil, from oppressive labour, and from disease. But Pandora brought with her the whole host of calamities, which rushed out, and spread over the whole world. When Epimetheus, or, as some say, Pandora, had, out of curiosity, raised the cover of the box, which a divine command had forbidden them to open, Hope alone remained at the bottom of the box, which was suddenly closed by the rash opener; and she alone enables man to endure his miseries and hardships.

PANEGYRIC; a eulogy, either written or spoken, the object of which is to give a favourable representation of some person or thing. Historical truth is so far rendered subordinate, that the author exaggerates the excellence of the subject, to inspire others with his own admiration. In the Grecian republics, this department of oratory was much cultivated, and the panegyric of Isocrates (q. v.), notwithstanding its artificial elaborateness, is a masterpiece of finished writing. In Roman literature, the best which we possess is the panegyric of Pliny the younger on Trajan, both in classical style and in rhetorical arrangement. The later Roman panegyrists of the third and fourth century, are valuable only to the historian who is seeking for facts. Among the moderns, the French have something similar in their *éloges*.

PANEL; a schedule or roll of such jurors as the sheriff returns to pass upon any trial; and *impanelling* a jury, is returning their names in such schedule of parchment. In Scottish law, the prisoner at the bar is the *panel*.

PANEL, in joinery, is a tympanum or square piece of thin wood, sometimes carved, framed, or grooved in a larger piece between two upright pieces and two cross pieces.

PANIN NIKITA IVANOVITCH, Count; a Russian minister of state, born in 1718. His family was originally from Lucca, in Italy; his father was general-lieutenant in the reign of Peter I. The young Panin served, at first in the guards of the empress Elizabeth, became chamberlain in 1747, was minister plenipotentiary to Copenhagen, and, two years afterwards, to Stockholm. On his return, he was made governor of the grand-prince Paul Petrovitch, and, when Catharine II. ascended the throne, in 1762, was appointed minister of state. The war against the Turks, to which the troubles in Poland gave rise; the exchange of the duchy of Holstein for the counties of Oldenburg and Delmenhorst (see *Olden-*

burg), to the advantage of the younger line of Holstein-Gottorp; the peace with the Porte in 1774; the mediation of Russia at the peace of Teschen; and, finally, the armed neutrality,—were effected principally through his representations. All the instructions of the military commanders and foreign ministers, and the whole correspondence with foreign courts were drawn up by him. He was the main support of the Prussian system in the Russian cabinet; but his influence over Catharine had much diminished towards the close of his ministry, while that of his adversaries had increased. (See *Catharine II.*) The principles on which he conducted public affairs were, that a state must always maintain its own dignity, without the interference of others, and that it is unbecoming a powerful state to have recourse to dissimulation and artifice, but that the most entire frankness should characterize all the measures of the ministry. His firmness was not to be shaken by threats or promises. He always advised what he thought was for the best, and, in such a case, he opposed even his own mistress. He died in 1783.

PANNONIA, in ancient history; the country inhabited by the Pannonians, a Thracian tribe, and situated between the Illyrians and Celts, on the northern side of the Eastern Alps. The emperor Augustus first succeeded in conquering the Illyrians and Dalmatians; he penetrated into the mountains of the Pannonians, and subdued them (A. D. 10). A dangerous conspiracy of this people against the Romans was suppressed by Tiberius. They appear to have afterwards settled, with the consent of the Romans, on the Danube. It was probably under the emperor Claudius that their country was first organized into a Roman province. Pannonia comprehends the eastern part of Austria and Stiria, all that part of Hungary (still called Pannonia) on the south of the Danube, a part of Carniola and Croatia, all Sclavonia, and a part of Bosnia, along the Save. It was probably Adrian who divided it into Pannonia *superior* or *occidentalis* (afterwards *prima*) and Pannonia *inferior*, or *orientalis* (afterwards *secunda*). After the Marcomannic war, Pannonia was repeatedly ravaged by barbarians. It suffered still more at the time of the great migration of the nations. In the fourth century, the Vandals conquered a part of the country, and afterwards the Goths. It was entirely conquered by the Huns under Attila. After the death of this conqueror, in 453, the kingdom of the Huns sunk back within its eastern limits on the Pontus. The Sarmatians, from whom are descended the Sclavonians of the present day, next settled on the mountains of Pannonia. Pannonia was also occupied, with the consent of the emperor of the East, by the Gepidæ and Ostrogoths. When the latter migrated to Italy, the Lombards entered Pannonia, and subdued the Gepidæ, but, removing to Italy in 568, left the country to the Avars (see *Avars*), who were conquered by Charlemagne, and forced to embrace Christianity. Pannonia was finally conquered by the Hungarians, about the year 900. See *Hungary*.

PANORAMA (from παν, all, the whole, and ὁραμα, view); a perspective view of a town or natural scene, projected on the plane of the horizon, invented by Robert Barker, an Englishman, in 1787. The panorama may be considered as the triumph of perspective. The artist, from a high point, must take an accurate plan of the whole surrounding country, as far as the eye can reach. Truth of representation and closeness of imitation are the great objects to be aimed at in panoramas, and the delusion must be promoted by the manner in which the picture is put up and lighted. It is circularly disposed round the walls of a rotunda, so that the spectator who is stationed in the centre, and prevented from approaching too near the painting, by a railing, finds himself, as it were, on the spot from which the view was taken. The light is admitted from above, without dazzling the spectator, from whom the aperture by which it enters is also concealed; and, as he sees no end to the picture, in which all the parts are delineated in their true proportion to the whole, and with the natural colouring, the illusion is complete. Robert Fulton introduced the panorama into France, and panoramic views of a great number of cities and natural scenes have been exhibited, within the last thirty years, in Europe and America. The *stereorama* (from στερεος, solid), or *panstereorama*, is a miniature representation, in relief, of towns and other objects, constructed of cork, pasteboard, or other light and flexible substances. The *diorama* was invented in France, and differs from the panorama chiefly in being flat instead of circular, and therefore presenting only a particular view, like any other picture, in front of you, and not all around. The manner in which the light is introduced is essentially the same as in the case of the panorama.

PANTALONE; a mask of the Italian comedy. (See *Mask.*) From him the *pantaloons* have their name, because he is dressed in wide, long garments of this sort.

PANTALOONS. See *Pantalone*.

PANTHEISM (from το παν, the body of all existing things, and Θεος, God). When man begins to think of the cause of things, he either separates the great original cause entirely from other existences (which is *monotheism* (q. v.), if he believe in one simple cause; or *polytheism*, if he believe in several, or, at least, in a multiplied emanation of causes from the great original cause), or he believes the great cause to be within the universe, that is, he considers the universe itself to be God, which is *pantheism*. This belief is generally the offspring of materialism (q. v.) consistently carried out. Some persons, however, have also applied the word *pantheism* to that doctrine of theology according to which God's Spirit not only pervades every thing, but every thing lives through him and in him, and there is nothing without him (*Acts of the Apostles*, xvii. 27 et seq.; *Ephes.* iv. 6). The character of this doctrine depends upon what is understood by *God*, and in what relation we consider existing things to stand to him, which must essentially determine our moral and religious notions. The chief modern supporters of pantheism, as first defined, are generally considered to be Bruno and Spinoza; hence *Spinozism* is often, yet wrongly, used for *pantheism*. Most of the systems of the Greek philosophers have this basis. The religions of heathen antiquity are pantheistic in so far as they take for granted a *fate*, or a forming power of nature, which determines every thing.

PANTHEON (from the Greek παν, every, and θεον, deity) signified, in antiquity, a temple sacred to all the principal deities in common. The most famous is the pantheon at Rome, which Agrippa, the favourite of Augustus, built on the *campus Martius*. Pope Boniface IV. consecrated it, in 607, to the Virgin Mary and all the martyrs; hence it is still called *St Maria ad martyres*. It is still more commonly called the *rotunda*, on account of its form. It is one of the finest edifices in Rome. Its stone roof is vaulted, and through a large hole in the centre of the roof the interior is lighted. The well-preserved portico seems to be of a later period than the temple itself; it consists of sixteen columns of Oriental granite, each of which is fifteen feet in circumference. The interior was formerly adorned with the most beautiful statues of the various deities, of which the best were carried, by Constantine, to Constantinople. At present, there are in the eight niches, eight fine columns, placed there by the emperor Adrian. The height of the temple is equal to the width, i. e. 137 feet. The diameter of the opening in the cupola is twenty-seven feet. The floor is paved with porphyry. It has suffered much from the emperors, the barbarians, and the popes. A smaller pantheon, at Rome, is, according to Montfaucon, considered to be the pantheon of the *Minerva Medica*. Ruins of a magnificent pantheon, which Adrian caused to be built at Athens, are still extant. It was supported by 120 columns. The pantheon in Paris was begun in 1764; it is in the form of a cross, 339 feet long and 253 feet broad, uniting, in its style, the Greek and Gothic. It was consecrated to St Genevieve, but, in the beginning of the revolution, was called *pantheon*, and appropriated to the reception of the ashes of great men. It then received the inscription *Aux Grands Hommes La Patrie Reconnaissante*. The Bourbons removed this inscription, and placed the following: *D. O. M. Sub Invoc. S Genovefæ. Lud. XV. Dicavit. Lud. XVIII. Restituit.* After the revolution of July, 1830, the people, in an immense mass, restored the noble and simple French inscription. The vaults under the church are skilfully arranged for the reception of the remains; they are neither damp, dark, nor gloomy. The tombs of Voltaire and Rousseau had been taken from their original situation, and placed in an obscure vault. The relics of Benjamin Constant were lately deposited there. The busts of Foy and Manuel have been lately placed in the pantheon.

PANTHER (*felis pardus*). There is much discrepancy of opinion among naturalists as to the distinctive characters of the panther and leopard, most zoologists having assumed that the former had six or seven rows of black spots in the form of roses, that is, formed by the assemblage of five or six simple spots, on each flank, whilst the latter had ten rows of still smaller spots. Mr Bowdich, however, states that some skins procured in Africa proved that this distinction was erroneous. Mr Temminck considers the leopard of Cuvier as a variety of the panther of the same author, and classes them both as leopards; and Buffon confounds the jaguar with the panther. The panther of Temminck is the *F. chalybeata*, found in Eastern Asia. It is observed by Cuvier, that this cannot be the panther of the ancients, as they procured the vast numbers exhibited at Rome from Africa. Pliny states, that Scaurus exhibited at one time one hundred and fifty; Pompey the Great, four hundred and ten; Augustus, four hundred and twenty. The panther is still found in Africa, from Barbary to the most remote parts of Guinea. It is to Africa, says Mr Pennant, what the tiger is to Asia, with this difference, that it prefers the flesh of brutes to that of human beings. It is almost untamable, always retaining its fierce, malevolent aspect, and perpetual muttering growl. The female is pregnant about nine weeks, and the young are born blind, continuing so for about nine days. The animal known under the name of panther, or more generally *painter*, in the United States of America, is the cougar or puma. See *Puma*.

PANTOMIME; the art of expressing action and emotion by gestures, in the largest sense of the word. Every lively conversation is accompanied by gestures, though very different both in nature and amount in different nations. The calm utterance of a speech in the British parliament, accompanied only by a simple motion in emphatic passages, would not suit an Italian, who delights in seeing a monk passing up and down the street whilst he preaches, with the crucifix in one hand, and a handkerchief in the other, to wipe off the moisture with which his excitement covers his cheeks; nor would even Talma's gesticulation suit all countries; yet the art of expressive gesture deserves to be ranked among the fine arts. The Greeks cultivated it much; but with them and the Romans, it took, like all their other fine arts, a plastic character, and the expression of individuality, was as much as possible suppressed; hence, also, their masks. The mimic art with the ancients was connected with declamation and music on the one hand, and with the dance on the other. Of the mimic dances Xenophon gives us a lively picture, in his Banquet and his Anabasis, vi. 1., § 3, 8. They were mostly representations of mythological subjects, or were of a warlike character. The Romans had actors very distinguished for impressive gesticulation, of whom Roscius is the most celebrated. His instructions were eagerly sought for by orators. In modern times, the art is sadly neglected. We do not suppose, indeed, that the delivery of the ancient actors could be advantageously imitated by our parliamentary debaters or pulpit orators, yet we can hardly doubt that they would awaken vastly more interest by a more careful study of the art of gesticulation. Among many works on this subject, Gilb. Austin's *Chironomia* is distinguished. In pantomime, the performer relies solely upon gestures. If an action is represented by a mimic dance, we have the ballet (q. v.): the ballet, therefore, is always pantomimic, but the pantomime does not necessarily require the dance. The Greeks had arrived at the separation of gesture from declamation, on which the pantomime is founded; thus we find that one person represented a character by gestures and artificial motions, guided by music (which, together, the Greeks called *ορχησις*, the Romans, *saltatio*), whilst another performed the declamation. Moreover, single situations, particularly comic scenes, were sometimes pantomimically performed among them (e. g. at banquets), but the true pantomime they had not. The word *pantomime* was invented in Italy; it meant, originally, an artist who imitates only by gestures. At a later period, entire theatrical representations, consisting of gestures only, were called *saltatio pantomimorum*. This species of performance was particularly developed under the first Roman emperors. Bathyllus (q. v.) and Pylades (the two great rivals in this art), Hylas and others, were celebrated in the times of Augustus, and not unfrequently gave occasion to riots, as the people took the greatest interest in these performances. But the pantomimes became so wanton, that many ancient authors consider this exhibition, in which the Romans took a passionate interest, among the causes of the decline of Roman greatness. The ancient pantomimes probably ceased with the decay of the Roman theatre. In the Italian mask a vestige of it remained. The pantomime, in the strictest sense, that is, unaccompanied with dancing, is an invention of modern times. More frequently, however, it has been united with the dance, and chiefly cultivated by the Italians and French. Noverre (q. v.), who must be considered as the father of the modern French dance, made a pantomime of Voltaire's Semiramis. With some Oriental nations, particularly with the Persians and Chinese, pantomimes accompanied by music form one of the chief amusements.

PANZER, George Wolfgang, a distinguished German bibliographer, born in 1729, at Sulzbach, was for some time a country clergyman, at Etzelwang, and afterwards at Nuremberg. His chief works are a History of the German Translation of the Bible by Luther (1783); Annals of the Early German Literature (Nuremberg, 1783); an addition to it (Leipsic, 1802. Nuremberg, 1805, 4to); and his *Annals Typographici* (Nuremberg, 1792, to 1803, 11 vols., 4to), in which he enumerates all works known to have been printed from the invention of the art of printing to the year 1536. The works in all languages are chronologically arranged, the place of printing given, also a short account of them, and the libraries and publications in which they are contained. Panzer died July 9, 1805, leaving a very valuable library.

PAO; Chinese for *fortress*, the same as *Tchai*, *Ouei*, &c., all of which appear in geographical names.

PAOLI, Pascal, a Corsican officer, distinguished by his exertions to maintain the independence of his native country, was born in Corsica, in 1726, and was the second son of Hyacinthus Paoli, a man of considerable influence in the island. The circumstances of the country inducing him to remove, with his family, to Naples, Pascal was there educated at the Jesuits' college. He was still engaged in the prosecution of his studies, when his countrymen, who had long been struggling for freedom against the Genoese, by whom they were held in subjection, sent him an invitation to become their chief. He accepted the proposal, and, going to Corsica, was appointed to the supreme government of the island in July, 1755. Having organized a regular plan for the conduct of affairs, both civil and military, Paoli opposed the Genoese with such spirit and success, that, after they had carried on hostilities against him for nearly ten years, they entered into a treaty with France, in pursuance of which a body of French troops was sent to their assistance; and, finding themselves still unable to conquer the island, they at length made a surrender of their claims of sovereignty over it to the French government. The duke de Choiseul endeavoured to prevail on Paoli to submit to the new arrangement, and accept of the office of commander-in-chief, under the authority of France. But he rejected all overtures of accommodation, and opposed with vigour the dangerous enemies he had now to encounter. At first he was successful, and a much greater force than had been anticipated was found requisite for the subjugation of Corsica. Fresh bodies of troops were sent thither, and, overpowered by numbers, Paoli found it necessary to consult his personal safety by flight from his native country. He made his way to the sea coast, and, embarking on board an English vessel, went to England, where he obtained from the government a pension of £1200 a year. In 1789, the island was recognised by a decree of the national assembly, as a department of France; and Paoli, being invited to resume his station at the head of affairs, resigned his pension, and took his departure from England. April 23, 1790, attended by deputies from Corsica, he presented himself at the bar of the national assembly at Paris, where he was received with enthusiasm, and took the oath of fidelity to the French government. The progress of the revolution disappointed the hopes which he had conceived; but he continued the connexion with France till after the execution of Louis XVI., when he abandoned his allegiance, and was invested with his original dignities of president of the *consulta*, or national council, and commander-in-chief of the island. He was encouraged to adopt these measures by the promise of assistance from Great Britain; and in February, 1794, a British army landed in Corsica. On the 14th of June following, a meeting took place of deputies from the different parts of the island, when, through the influence of Paoli, a decree was made, declaring the separation of Corsica from France, and its union to the British empire. Paoli subsequently returned to England, in consequence of some difference with the viceroy, Sir G. Eliot. Having had the misfortune to lose the bulk of his property through a commercial failure at Leghorn, he was reduced to difficulties on his return to London; but, his pension being restored, he was relieved from his embarrassment, and passed the remainder of his days in tranquillity. He died in London, February 5, 1807. See Boswell's *Account of Corsica*.

PAOLO, Fra. See *Paul of Venice*.

PAOLO GIOVIO. See *Jovius*.

PAPACY. See *Pope*.

PAPAS. The ancient Greek *πάππας* (papa, father), at present the name given to every clergyman in the Greek Catholic church, is the original of *papa*, *pape*, *papst*, *pope*, &c. Zealous as cardinal Baronius is for the glory of the Roman see, he allows that in the East, as well as in the West, the title *papas* (or pope) belonged to all bishops in the first centuries; and the title was even bestowed on venerable clerks. In the times of Cyprian, St Ambrosius, Jerome, Augustine, every bishop had the title of *pope*, as their writings show. At the seventh œcumenical council, in 869, at Constantinople, only the four patriarchs of the Greek church were called *popes*, and the bishop of Rome determined to appropriate the title to himself; but it required the iron hand of Gregory VII. to carry the plan into effect. He assembled some Italian bishops at Rome, in 1073, who formed an assembly called a *council*, which excommunicated the emperor Henry, and declared that no one had the right to the title of *pope* except the bishop of Rome.

PAPAW. The plant so named, in the United States of America, is a shrub, or rarely a small tree, inhabiting all parts of the country south of the fortieth parallel of latitude, and even some degrees farther north, on the western side of the Alleghanies. It is rare, however, in the lower parts of the Southern States, and is most abundant in the basin of the Ohio, where it sometimes forms thickets occupying exclusively several acres. Its presence is indicative of extreme fertility in the soil; and, in a favourable situation, it sometimes attains the height of thirty feet, with a diameter, at base, of six or eight inches. The papaw has received from botanists the name of *asimina triloba*, and belongs to the *anonaceæ*, a family of plants almost exclusively tropical. The leaves are five or six inches long, elongated, and wedge-shaped; the flowers are large, pendent, and dark purplish brown; the fruit is about three inches long, thick, fleshy, and contains several large triangular stones; when ripe, it is of a yellowish colour, and the pulp is soft and edible, but it is insipid to the taste, and is not much esteemed. The wood is extremely soft, spongy, and is applied to no use in the arts. The cellular integument of the bark, especially of the roots, exhales a nauseous odour. Three other species of *asimina* inhabit the more southern parts of the United States, and a fourth is found in Mexico. These, together with the common papaw, constitute a genus exclusively North American. The true papaw (*carica papaya*) is a widely different plant, and a native of the East Indies. It has very much of the habit of a palm, and attains the height of about twenty feet, having a thick, simple stem, herbaceous in its consistence, and naked till within about two feet of the top, and marked with the cicatrices of the fallen leaves, throughout the greater part of its length. The leaves have long footstalks, are very large, deeply divided into seven, nine, or eleven lobes, which are sinuate and incised. The male flowers are pure white, agreeably scented, and are disposed in loose clusters upon long peduncles; the female flowers are very numerous, large, and bell-shaped, composed of six yellow petals, and are supported on short simple peduncles. The fruit is oval, furrowed, about as large as a small melon, full of a sweetish pulp, and contains oblong, wrinkled, and brown or blackish seeds. It is eaten both in a crude state and prepared in various manners, and has an aromatic, sweetish, and tolerably agreeable flavour;

but, when cultivated in our greenhouses, the fruit is entirely worthless. This plant is remarkable for the rapidity of its growth, rising to the height of six feet in about six months; it flowers and bears fruit throughout the year. Four other species of *carica* inhabit the intertropical parts of America, and, according to Bartram, one is found in East Florida, but it has not been seen there by later travellers.

PAPER, HISTORY OF. The most ancient kind of paper, the Egyptian, was made of the *cyperus papyrus*. (See *Papyrus*.) According to the information handed down to us, the skins or fibres were separated in thin layers from the blade of the grass, and spread upon a table moistened with water from the Nile. The same adhesive water was heated, and the layers were wet with it. Upon the first layer another was placed, pressed and dried in the sun, and smoothed with a tooth. The age of this all-important invention is uncertain. In later times, the Romans devoted great industry to the preparation of paper; they had their *glutinatores* (those who glued the paper), *malleatores* (hammerers), &c. According to Pliny, the sheets of the Romans were generally thirteen inches wide. There are, however, distinguished antiquarians, and among them the famous chevalier Landolina (died 1810, in Sicily), who maintain that it was the pith of the plant which the ancients chiefly used for the purpose of making paper; and he supports his opinion by ingenious experiments made with a plant growing near Syracuse, and which corresponds to the description given by the ancients of the papyrus. The Egyptian paper was called *βιβλος*, *papyrus*, *charta Ægyptiaca* or *Niliaca*. The greatest quantity of paper was made in Alexandria, which greatly increased its wealth by its commerce in this article. In the fifth century, this paper was rendered very dear by heavy taxes. In the eighth century, it began to be supplanted by cotton paper; yet it was used in Italy until the eleventh century. The natives of Mexico, before the Spanish conquest, prepared their paper from the leaves of the agave (q. v.), in a manner resembling the ancient mode of preparing papyrus. They removed all the fleshy substance from the leaves, by putting the plant in water, laid the remaining fibrous textures one on the other, and besmeared them with a clayey substance, which gave to the whole much firmness and elasticity. Besides the papyrus, there are remnants of ancient paper made of the inner bark of trees, which, however, does not seem so general, on account of its brittleness. The papyrus seems to be better fitted for resisting the tooth of time than any other writing material. To give a single instance: Mr Saillier, at Marseilles, who possesses a number of Egyptian papyrus manuscripts, has two rolls, which Champollion the younger, when embarking for Egypt in 1829, discovered to contain the history of the wars and reign of Sesostris the Great; their date is that of the ninth year of his reign. But Sesostris-Rhamses, or the Great, according to the calculations of German chronologists, lived in the time of Moses; being, it is supposed, the son of the Pharaoh who perished in the Red sea. Whatever may be thought of the date assigned to these manuscripts, it is certain that their age is very great. In the eleventh and twelfth centuries, much was written on *membranes*. The Arabians became acquainted, in 704, A. D., with the cotton paper in Bucharia, prepared it themselves of raw cotton, and transplanted the art to Spain in the eleventh century. In that country, where water-mills were in use, the first paper-mills also were set up, and at a later period carried over (about the year 1300) to Italy, France, and Germany. In these mills the manufacture of paper from cotton rags was commenced. This cotton paper was known under the name of *charta serica*, *cottonea*, *gossypina*, *xylina*, *damascena*, also *Parcamena Græca*. It differs from the linen paper by its less compact texture, and by more easily breaking and blotting. Most of the American printing paper is made of cotton, on account of the great use of cotton fabrics compared with linen in this country; and for this reason it is mostly soft and liable to be torn. But, to judge from the appearance of some remnants of Spanish paper of the twelfth century, attempts were made as early as that time to add linen rags to the cotton ones, which probably led, at a later period, to the invention of linen paper. Proper linen paper hardly makes its appearance before 1318; but from that year the archives of the hospital in Kaufbeurn, in Germany, contain documents upon linen paper; and in the city archives of the same place are documents of 1324, 1326, 1331, upon the same kind of paper: hence it is probable that the first linen paper was made in Germany. Spain and Italy have no linen paper before the year 1367, in their archives or libraries. This paper was not derived from China, as the Chinese to this day manufacture their paper of raw hemp and the rind of bamboos and mulberry-trees. Linen paper is esteemed the best, on account of its firmness and durability. The English at present make the finest paper; they have brought it to great perfection in respect of whiteness, firmness, and fineness, though the old paper, with a yellow tinge, was probably better for the eyes than the dazzling white paper used at present. The French also manufacture very fine paper. The Italians and Germans make the cheapest paper, as durable as that of the nations already mentioned, but not so fine. The manufacture of paper has of late rapidly increased in the United States of America. According to an estimate in 1829, the whole quantity made in this country amounted to about five to seven millions a year, and employed from ten to eleven thousand persons. Rags are not imported from Italy and Germany to the same amount as formerly, because people here save them more carefully; and the value of the rags, junk, &c., saved annually in the United States, is believed to amount to two millions of dollars. Machines for making paper of any length are much employed in the United States. The quality of American paper has also improved; but, as paper becomes much better by keeping, it is difficult to have it of the best quality in this country, the interest of capital being too high. The paper used there for printing compares very disadvantageously with that of Britain. Much wrapping paper is now made of straw, and paper for tracing through is prepared in Germany from the poplar tree. A letter of Mr Brand, formerly a civil officer in Upper Provence, in France (which contains many pine forests), dated February 12, 1830, has been published in the French papers, containing an account of his successful experiments to make coarse paper of the pine tree. The experiments of others have led to the same results. Any of our readers, interested in this subject, can find Mr Brand's letter in the *Courrier Français* of November 27, 1830, a French paper published in New York. In salt works near Hull, Massachusetts, in which the sea-water is made to flow slowly over sheds of pine, in order to evaporate, the writer found large quantities of a white substance—the fibres of the pine wood dissolved and carried off by the brine—which seemed to require nothing but glue to convert it into paper.

Paper-Making.—The combination of flexible fibres by which paper is produced, depends on the minute subdivision of the fibres, and their subsequent cohesion. Linen and cotton rags are the common material of which paper is made; but hemp and some other substances, as straw, are used for the coarser kinds. These materials, after being washed, are subjected to the action of a revolving cylinder, the surface of which is furnished with a number of sharp teeth or cutters, all so placed as to act against other cutters fixed underneath the cylinder. The rags are kept immersed in water, and continually exposed to the action of the cutters for a number of hours, till they are minutely divided, and reduced to a thin pulp. During this process, a quantity of chloride of lime is mixed with the rags, the effect of which is to *bleach* them, by discharging the colouring matter, with which any part of them may be dyed, or otherwise impregnated. Before the discovery of this mode of bleaching, it was necessary to assort the rags, and select only those which were white, to constitute white paper. If, however, the bleaching process be carried too far, it injures the texture of the paper by corroding and weakening the fibres. In that kind of paper intended for lithographic printing, the rags should not be bleached by chlorine at all; the least quantity of chlorine will materially injure it. The pulp, composed of the fibrous particles mixed with water, is tranferred to a large vat, and is ready to be made into paper.

Paper is made either by the hand or by machinery. When it is made by the hand, the workman is provided with a *mould*, which is a square frame with a fine wire bottom, resembling a sieve, of the size of the intended sheet. He dips this mould, and lifts up a portion of the thin pulp, and holds it in a horizontal direction. The water runs out through the interstices of the wires, and leaves a coating of fibrous particles, in the form of a sheet, upon the bottom of the mould. The sheets thus formed are subjected to pressure, first between felts or woollen cloths, and afterwards alone. They are then *sized*, by dipping them in a thin solution of gelatin, or glue, obtained from the shreds or parings of animal skins. The use of the size is to increase the strength of the paper, and, by filling its interstices, to prevent the ink from spreading among the fibres by capillary attraction. In *blotting* paper, the usual sizing is omitted. The paper, after being dried, is pressed, examined, selected, and made into quires and reams. *Hot-pressed* paper is rendered glossy by pressing it between hot plates of polished metal.

Paper is also manufactured by machinery, and one of the most ingenious methods is that invented by the Messrs Fourdrinier. The general principles upon which paper-making machinery operates are not difficult of comprehension. The rags, after having been cut by the machine formerly alluded to, and soaked in water, are in a state of pulp placed in a wooden trough, called the *vat*. This vat is placed at one extremity of a long wooden frame, which has a revolving cylinder at each of its ends. Over these two cylinders, which both revolve in the same direction, there is stretched an endless web of brass wire cloth. The vat, at the one end of the frame, has an opening or slit along its whole length, which is intended to permit the pulp to flow down upon the wire web below; and in order to regulate the proper quantity of pulp, that flows down from the vat to the web, the slit in the side of the vat may be made larger or smaller by means of a regulating screw. The cylinders being in motion while the pulp is flowing from the vat upon the web, and continued sheet of pulp, will be laid upon the web, which is in continual motion forward from the vat. The web moves slowly forward, and the pulp is dispersed equally over its surface by the action of eccentrics keeping it in a tremulous motion. When the web arrives at the cylinder, at the other end of the frame, the sheet of pulp is wiped off by a large revolving cylinder, covered with felt or flannel, from which it advances through between a series of rollers, and over three polished cylinders heated by steam, the second being of a higher temperature than the first, and the third than the second. From the last steam cylinder the pulp is delivered dried, and in the state of paper on to a reel, when it is cut into sheets. Another machine for making paper consists of a horizontal revolving cylinder of wire web, which is immersed in the vat to the depth of more than half its diameter. The water penetrates into this cylinder, being strained through the wire web, at the same time depositing a coat of fibrous particles on the outside of the cylinder, which constitutes paper. The strained water flows off through the hollow axis of the cylinder, and the pulp is wound from the part of the cylinder above water, in a continued sheet. It would be totally inconsistent with the plan of this work to enter into minute detail in describing the machinery employed in paper manufacture, and numerous plans, elevations, and sections would be necessary to make the action of all the parts intelligible even to a practical mechanic. The account we have given will be understood by the general reader, and those who wish for minute details must have recourse to the accounts given of the various patents that have been taken out by the original inventors, and those who have followed them in the way of improvement.

It may be remarked that a most important part of the process must be performed on the material before it comes to the machine, in order that the paper may be of a good quality, and free from knots and other irregularities of surface. After the rags have been thoroughly cut, they are passed through a sieve in the state of pulp, which sieve is of such a finenessas to allow the pulp to pass through, while the coarser particles are retained. This process, which is equally essential to the hand and to the machine paper-making, has consequently received great attention from those who have devoted themselves to this important branch of manufacture, and several ingenious contrivances have been devised for the effective clearing of the pulp. Mr Turner contrived a most ingenious piece of apparatus for this purpose, in which he caused the pulp to pass through a sieve of a given fineness, varying with the quality of the paper to be made, and assisting the passage of the pulp through the sieve, by causing a partial vacuum to be formed below it. Mr Dickinson and Mr Ibitson have also invented ingenious and effective machines for the same purpose. By peculiar contrivances, invented and patented by Messrs Towgood and Smith, the paper is sized before it leaves the machine, and also cut into sheets by the apparatus of Fourdrinier, or that of Mr Cowper. For the purpose of making very thick drawing or copper-plate printing paper, or fine bristol boards, a process called *couching*, is followed; this consists in uniting two or more sheets, and pressing them together, in order to form one thick sheet. This is a tedious process, and adds considerably to the cost of these papers. Mr Dickinson, to whose ingenuity much is due for improvements in all the departments of the paper-making machinery, has some time since taken out a patent for making plate and drawing papers, by the union of the two continuous sheets of pulp in the machine. One web of pulp moves from each end of the machine towards the centre, where, both passing between rollers, become united, and being taken up by a web of felt are passed over the drying rollers, and delivered in one thick sheet upon the reel. Mr Cubb has lately invented a method of fabricating a beautiful species of embossed paper, coloured in the pulp, and adapted for paper hangings, or for decorating the walls of rooms; and as the patentee can unite different kinds of paper together, or paper with plain or figured silk or cotton, an endless variety of effect may be produced.

PAPER MONEY. See *Circulating Medium.*

PAPER MULBERRY. See *Mulberry.*

PAPHOS. There are two cities of this name in the island of Cyprus—old Paphos, ten stadia distant from the western coast, upon a height; and new Paphos, situated on the sea-shore. The first was famous in antiquity for the worship of Venus, thence called *Paphia* or *Cypria*. It was said that Venus here first landed, when she arose out of the sea. Here was an old image of the goddess, not made to represent the human form, but a white, twisted stone, terminating in a point; also the oldest temple in the island, which contained large treasures, and in which bloodless offerings were presented to Venus (Astarte, Aphrodite), such as incense and garlands of flowers. This image, together with an old tradition, seems to prove that the early worship of the goddess, in this place, was accommodated to the Phœnician and Syrian religious rites. New Paphos was famous as a place of commerce, and for its harbour; it suffered greatly by earthquakes, and was nearly destroyed by them during the reign of Augustus. Paul here preached the gospel to the proconsul Sergius.

PAPIER MACHE is a substance made of cuttings of white or brown paper, boiled in water, and beaten in a mortar till they are reduced into a kind of paste, and then boiled with a solution of gum Arabic, or of size, to give tenacity to the paste, which is afterwards formed into different toys, &c., by pressing it into oiled moulds. When dry, it is covered with a mixture of size and lamp-black, and varnished.

PAPILIO, or BUTTERFLY; a large genus of insects belonging to the *lepidoptera*, now divided into a great number of sub-genera, the genus *papilio* of Linnæus forming the family of *diurnæ* of Latreille, whilst the genus is restricted to such of this family as have naked chrysalids, of an angular form, and attached by the tail; the perfect insect has six legs; the internal border of the inferior wings is concave or scalloped; in fact, it only includes the first division of the Linnæan genus, viz. the *equites*. One of the most remarkable and interesting circumstances connected with this beautiful class is their series of transformations before reaching a perfect state. The female butterfly lays a great quantity of eggs, which produce caterpillars, destructive to the foliage of almost all vegetables. After a short life, these assume a new form, and become chrysalids—the tomb of the caterpillar and the cradle of the butterfly. These chrysalids are attached in various ways, and are of various forms; some of a corneous appearance, with brilliant golden or argentine spots; others resembling a silken pod; within this covering the proscribed and often disgusting caterpillar becomes the agile and brilliant butterfly—a change which poets have made typical of immortality. The mode in which the perfect insect is packed in his narrow cell, is very curious. It is fully described in the works of Swammerdam. When the period of its confinement has elapsed, the fly escapes from his prison-house by disgorging a frothy liquor, which dissolves the glutinous matter that gives solidity to the chrysalis, and this at last yields to the efforts of the enclosed insect, when it emerges perfectly formed for flight, but unable to use its wings until the air has given them consistence. If, however, the heat of the weather is too great, instead of expanding into a firm and flat membrane, they present a folded or corrugated appearance, and are wholly useless. These insects, in their perfect form, take little food: for a short time, they void a fluid of a reddish colour, perhaps the remains of food, ingested before their last change. This discharge is probably the cause of the showers of blood spoken of by early writers, which occasioned so much alarm. A single female butterfly produces several hundred eggs, but their over increase is checked by a host of enemies. A single pair of sparrows, it is calculated, will destroy upwards of 3000 caterpillars in a week: great numbers are also killed by a species of fly, which deposits its eggs in the caterpillar, where they hatch, and the produced larvæ feed on the internal parts of their unhappy nurse. See Cramer, Reaumur, Madame Merian, &c.

PAPIN, Denys, an eminent natural philosopher, was a native of Blois, in France. After finishing his studies, he made a visit to England, and, in 1680, was admitted a fellow of the royal society. Being a Protestant, the revocation of the edict of Nantes prevented him from returning to his native country, and, on leaving England, he settled at Marburgh, in Germany, as a teacher of mathematics. Papin chiefly distinguished himself by his researches concerning the power of steam, and the influence of mechanical pressure in retarding the ebullition of liquids. He suggested the principle which led to the invention of the steam-engine (see *Newcommen*); but he is best known for an invention of his own, denominated *Papin's digester* (see *Digester*), to soften bones, &c.

PAPINIANUS, Æmilius; the greatest Roman lawyer of his time, born under Antoninus Pius, in the year 140, and a native either of Beneventum, in Italy, or of Syria, He applied himself to the study of Grecian and Roman literature, philosophy and jurisprudence, and, by his solid learning and inflexible integrity, obtained great credit and influence, was honoured with the first offices of state, and, at last, was chosen prefect of the pretorian guards. The emperor Severus, on his death-bed, recommended to his care his two sons, Caracalla and Geta. Papinian tried all means of preserving concord between them, but his remonstrances were so disagreeable to Caracalla, that he at last removed him from his place, though he still continued to treat him, outwardly, as a friend and confidant. When Caracalla had caused his brother to be assassinated, he asked Papinian to justify the deed, but received for answer, that it was easier to commit fratricide than to justify it, and that it would be a second murder to sully the memory of an innocent man. Caracalla concealed his anger; but, when the pretorian guards, probably at the instigation of the tyrant, demanded the head of Papinian, he gave him up to their fury, and caused him to be executed, in the year 212. Papinian wrote several works, and educated several distinguished scholars. His reputation as a lawyer was so high, that Valentinian III. ordered that, whenever the opinions of the judges were divided, Papinian's opinion should be followed. Everardus Otto has designated every thing of his in the pandects, and has written his life (Bremen 1743).

PAPPENHEIM, Godfrey Henry, count of, imperial general in the thirty years' war, was born 1594, descended from an ancient and noble German family. He distinguished himself in the battle of Prague as colonel, in which he was severely wounded, and left on the field, where he was found by his own soldiers, who were stripping the slain. In 1626, he conquered, with the assistance of the Bavarians, 40,000 peasants in Upper Austria, who had taken arms to defend their faith; then traversed Northern Germany, and joined, in 1630, general Tilly, whom he even outdid in cruelty, on the taking of Magdeburg. His fiery courage distinguished him every where; but he was not qualified for a commander-in-chief. Tilly ascribed the loss of the battle of Leipsic to his impetuosity. He appeared on the field of Lutzen (q. v.), on the side of Wallenstein, was mortally wounded, and exclaimed, when he heard that Gustavus had also fallen, "Let the duke of Friedland (Wallenstein) know that I am mortally wounded; but I depart with joy, as I know that the implacable enemy of my faith has fallen with me on the same day."

PAPYROGRAPHY (so called by Mr Sennefelder); the art of taking impressions from a kind of pasteboard, covered with a calcareous substance (called *lithographic paper*), in the same manner as stones are used in the process of lithography. It is an art but lately invented. See Sennefelder's *Papyrographische Sammlung.*

PAPYRUS (*cyperus papyrus* of Linnæus). This sedge-like plant has acquired celebrity from its furnishing the paper of the ancient Egyptians. The root is very large, hard, and creeping; the stem is very stout, naked, except at the base, eight or ten feet high; triangular above, and terminated by a compound, wide-spreading and beautiful umbel, which is surrounded with an involucre composed of eight large sword-sharped leaves. The inconspicuous flowers are disposed in little scaly spikelets, which are placed at the extremity of the rays of this umbel. It is an aquatic plant, and the lower part of the stem is always immersed in water. The papyrus grows in the swamps along the borders of the Nile, and not in the stream itself, as has been supposed. Bruce observed it in the Jordan, and in two places in Upper and Lower Egypt. It now grows wild in Sicily, and late travellers have discovered it in some of the western rivers of Africa, which circumstance renders it probable that it is found throughout the greater portion of the interior of that continent. The uses of the papyrus were by no means confined to the making of paper. The inhabitants of the countries where it grows, even to this day, manufacture it into sail-cloth, cordage, and sometimes wearing apparel. Boats are made by weaving the stems compactly together, and covering them externally with a resinous substance, to prevent the admission of water. Although these resemble baskets in their appearance, they are of great utility, and indeed are the only kind known in Abyssinia. The roots are also employed for fuel. The most ordinary use, however, was for the manufacture of paper, by a process which has been known from th eremotest antiquity, even before the historical times of Greece. (For this, see *Paper.*) In order to raise the plant in our green-houses, it is necessary to place it in a cistern of water, having rich mud at the bottom.

PAR (Latin, *equal*) is used to denote a state of equality or equal value. Bills of exchange, stocks, &c., are *at par* when they sell for their nominal value; *above par* or *below par* when they sell for more or less.

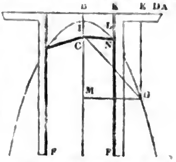
PARA; a Greek preposition of very various meaning, according to the case which it governs. In compound words, it means *above, aside, against, about, thereto,* &c., and it appears in a very large number of our compound words.

PARA; a Turkish coin, very thin and small, of copper and silver, the fortieth part of a Turkish piaster, which is constantly varying in value, sometimes fourteen of them being equal to a Spanish dollar, sometimes fifteen, &c. It is as light in weight as it is of little value, and the writer well recollects its liability to be blown away in making payments in the open air in a windy day. The Greek *phœnix* is the sixth part of a Spanish dollar.

PARABASIS; a transition, fault, extravagance; particularly a part of the ancient comedy, in which the poet himself addresses the spectators, through the leader of the chorus.

PARABLE (from the Greek, παραβολη); sometimes a mere simile, but usually a series of them, or a tale made up of similes. The parable differs from the allegory by the circumstance of being less symbolical. The original idea is not kept so completely out of sight. From the fable proper it differs by being taken from the province of reality. Fine parables are contained in the Old and New Testament; this mode of instruction, in fact, is very common with the Eastern nations; e. g. the parable which Nathan addressed to David, Christ's parable of the prodigal son, of the labourers in the vineyard, of the faithless steward. Herder and Krummacher have distinguished themselves among the German writers by their parables.

PARABOLA; a curve, formed by that section of a cone in which the axis of the section is parallel with the opposite side of the cone. The following is an easy method of drawing the parabola. Let AB be a right line, and C a point without it, and DKF a square in the same plane with the line and point, so that one side, as DK, be applied to AB, and KF coincide with the point C; on F, fix one end of the thread FNC, and the other at the point C; and let part of the thread, as FN, be brought to the side KF by a pin N; then let the square DKF, be removed from B to A, applying its side DK close to BA; and in the mean time the thread will be always applied to the side KF; and by the motion of the pin N there will be described a curve called a semi-parabola. Then bringing the square to its first position, moving from B to H B the other semi-parabola will be described.



The point, where the side of the cone is intersected by the plane, is called the *apex.* All the parallel lines which are drawn within the curve perpendicularly through the axis (which runs from the apex through the surface of the curve), are called *ordinates;* the halves into which the axis is divided, *semiordinates*: the portion of the axis from the apex to its point of intersection with a given ordinate, the *abscissa* of that ordinate; the two sides of the curve, from the apex to the base of the cone, the *legs* of the parabola. The length of the legs varies with the distance of the section from the vertex of the cone. The distance of its apex from the vertex of a given cone determines its curvature. The square of the semiordinate in the parabola is equal to the rectangle of the abscissa of the semiordinate and of the parameter, a line which is to the distance of the apex from the vertex of the cone as the square of the diameter of the base is to the square of the side of the cone. The magnitude of the parameter is always the same for any given distance of the apex from the vertex, and consequently for any given parabola; but the semiordinates and their abscissas are longer in proportion as the latter are farther from the apex. If the side of the cone and the diameter of its base, and consequently also their squares, are equal to each other, the parameter is equal to the distance of the apex from the vertex of the cone; or, in other words, this distance itself is the parameter. The point in the axis where the abscissa is equal to the parameter, is called the *focus.* It bears this name, because the theory of the parabolic concave mirror is founded upon its principal property. The theory of the parabola is not less important in the science of gunnery. Every projectile, which does not fall perpendicularly, moves in a direction resulting from the force of projection and the gravitation of the projectile, and the parabola enables us to calculate mathematically the path of a projectile in free space, from the proportionate magnitude of the two forces. Setting aside the resistance of the air, it is demonstrable that the path of the projectile must be a parabola, whose apex is its greatest height, i. e. greatest distance from the earth's centre of gravity. If the projection is horizontal, the apex is then at the point where the free path begins, and the body describes one leg of a parabola. If the direction is between the horizontal and perpendicular, the body describes one leg of a parabola in its ascent, and the other in its fall; and in both cases, therefore, the path of the body is easily determined. And, on the contrary, if the distance and position of an object are given, it is easy to determine, from the force of projection, and the weight of the projectile, the angle of direction which should be given to the latter. The resistance of the air will affect the direction of the projectile; but in small heavy bodies, the effect is trifling; and in the larger, such as bombs, it is easily determined on mathematical principles. See *Projectiles*, and *Mechanics*.

PARABOLIC MIRRORS. See *Burning Mirrors*.

PARABOLOID, in geometry, is a body generated by the rotation of a parabola around its axis.

PARACELSUS, or PHILIPPUS AUREOLUS THEOPHRASTUS BOMBASTUS DE HOHENHEIM; a celebrated empiric and alchemist, born at Einsiedeln, near Zurich, in Switzerland, in 1493. His father, a physician, is said to have been the natural son of a Teutonic knight. After some education at home, he visited France, Spain, Italy, and Germany, with a view to improvement in medicine, and the arts and sciences connected with it, especially chemistry. In the course of his travels, he became acquainted with some remedies not in common use among the faculty (probably preparations of mercury), by means of which he performed extraordinary cures, and obtained great reputation. Returning to Switzerland, he taught medicine and surgery at Basle, delivering his lectures partly in the German language, for want of a sufficient knowledge of the Latin. At length, having cured John Lichtenfels, a rich ecclesiastic, of a dangerous disease, and being precluded, by a decision of the magistracy, from obtaining the stipulated reward, for which he was obliged to sue his patient, he was so enraged at the disappointment, that he grossly abused the judges, and, becoming apprehensive of their resentment, took his departure from the city. He then led a wandering life in Alsatia, accompanied by his pupil Oporinus, who, disgusted with his violence and intemperance, at length left him to pursue his wild career alone. Paracelsus professed an utter contempt for the practice of his medical contemporaries, and boasted of an intercourse with spirits, and the possession of the philosopher's stone, and the elixir of life; but he disgraced his pretensions by dying in the forty-eighth year of his age, after a few days' illness, at the hospital of St Sebastian at Salzburg, in 1541. Among the writings attributed to Paracelsus are some on surgery, chemistry, and theology, many of which remain unpublished. A collection of his works, in eleven volumes, quarto, was printed at Basle, in 1589; also one printed at Geneva, in 1658, with a preface, containing an account of the author.

PARACHUTE; a silk instrument, of an umbrella shape, about twenty feet in diameter, attached to balloons, by means of which the aeronaut may descend slowly from a great height. Blanchard made the first successful experiment with one in London, in 1795. Garnerin has also invented a peculiar kind of parachute.

PARACLETE (παρακλητος, a counsellor, comforter); in the English translation, the Comforter; the Holy Ghost. Jesus promised to his disciples (*John* xiv. 16), that his Father would send them another Comforter, the Spirit of truth, who should abide with them for ever, and (vr. 26) teach them all things. See *Abelard*.

PARADISE (from the Greek word παραδεισος, a garden, a park, by which the garden of Eden is rendered in the Greek translation of the Old Testament from the Hebrew); the garden of Eden, in which the first parents of the human race were placed after their creation. Here they lived in a state of innocence, until they forfeited the favour of God, and were expelled from their happy seat, for an act of disobedience. Commentators are divided as to the situation of Eden.

PARADISE, BIRD OF (*Paradisea*, Lin.); bill straight, compressed, strong, and notchless; nostrils covered with feathers of a velvety or metallic lustre; plumage singular and splendid. They occur in Japan, China, Persia, and various parts of India, but are supposed to be originally natives of New Guinea. They were formerly supposed to live on dew, to be without legs, and never to alight. The legs were, in fact, torn off in preparing the birds for ornaments. There are several species. The *great bird of Paradise* (*P. major*, Shaw; *apoda*, Lin.) is of a cinnamon hue; crown luteous; throat golden green or yellow; side feathers very long and floating; length, from the end of the bill to the end of the real tail, about twelve inches; but to the end of the long hypochondroid feathers, nearly two feet. This species is found in the Molucca islands, and those round New Guinea, particularly Papua and Aru, where they arrive with the westerly monsoon, and return to New Guinea with the easterly. They move in flights of thirty or forty, with a leader above the rest, and preserve their light and voluminous plumage in order, by always flying against the wind. Sometimes, however, a sudden change of wind discomposes their feathers, so that they fall. Judging from their bill and claws, it is not improbable that they subsist both on animal and vegetable food.

PARAGUAY; a republic of South America, situated between the Parana on the E. and S., the Paraguay on the W., and Brazil, from which it is separated by the Xexuy and a mountainous ridge on the N.; lat. 24° to 27° 30′ S.; lon. 54° 40′ to 58° 30′ W. It comprises a superficial area of about 50,000 square miles, with a population differently estimated at 150,000, 200,000, and 300,000.

Paraguay was discovered by Sebastian Cabot (then in the service of Spain), in 1526. In 1776, it formed a province of the newly established viceroyalty of Buenos Ayres, previously to which it had formed a sort of theocratical commonwealth, under the government of the Jesuits. It was this circumstance that led to their banishment from Portugal in 1759, and from Spain in 1767. (See *Jesuits*.) At the time of the abolition of the order, their state embraced above forty missions (*doctrinæ*), comprising, besides Paraguay properly so called, Tucuman, Rio de la Plata, and the *corregimento* of Tarja; the seat of the ruling provincial and his four counsellors was at Cordova. No European was permitted to enter their territory; forts were erected, an armed force maintained, and the commerce was entirely in their hands. In 1752, Spain, having ceded seven of the Jesuit missions to Portugal, the society, after vainly throwing every obstacle in the way of the cession, finally instigated the natives to armed resistance; but their forces were defeated by the united Spanish and Portuguese armies (1756), and the order was expelled from Paraguay. (See Southey's *History of Brazil*.) In 1810, the junta of Buenos Ayres sent a body of troops to depose the Spanish governor of the province, but they were forced to retreat. The inhabitants, however, soon after deposed the governor themselves, and formed a junta, which administered the government in the name of Ferdinand VII. In 1813, they proclaimed Paraguay a republic under two consuls—doctor Francia and Yegros. At the end of the year, the former caused himself to be named dictator for three years, and, at the expiration of that term, for life. In 1826, he first declared Paraguay independent, and, in 1827, its independence was formally acknowledged by dom Pedro, then emperor of Brazil. Under the domination of doctor Francia, Paraguay has been reduced to order, and advanced considerably in prosperity, although he has committed many most outrageous acts of tyranny. The celebrated Bonpland, who received orders to leave the country in 1829, was afterwards detained until February, 1831, having been confined nine years. The two travellers Rengger and Longchamps, who were detained in the country six years (1819—1825), have published an *Essai sur le Gouvernement dictatorial du Doctor Francia* (Paris, 1827; English, London, 1830).

The inhabitants are Creoles, who compose about seven tenths of the population; natives (*Guaranas*), one tenth; the blacks and mixed breeds, with a few hundred Spaniards, the remainder. The standing army of the dictator consists of 5000 men; the militia, of 20,000. The climate of Paraguay is mild and healthy, but moist; the face of the country is level, and the soil in general fertile. Tropical fruits, corn, and the vine, thrive very well; the sugar-cane, rice, maize (of which the natives make an intoxicating drink), excellent tobacco, indigo, various drugs, such as jalap, quinquina, rhubarb, &c., and many valuable forest trees, abound. The *matte*, or Paraguay tea-plant, is a small plant, the leaves of which resemble senna; they are dried, and used all over South America, in the form of an infusion, as the tea of China is used with us. The principal articles of export are matte, tobacco, sugar, cotton, wax, and tallow and hides obtained from the immense herds which roam in the vast plains of Paraguay. The ostrich, parrots, boas, rattle-snakes, cougars, and jaguars are among the wild animals.

PARALLAX; the angle formed by two different lines of view drawn towards one and the same object. Suppose a point is seen from the two ends of a straight line; the two lines of view towards that point form, with the other straight line, a triangle whose angle at the object is the parallax. The parallax is of particular importance in astronomy for the calculation of the distance of heavenly bodies. These may be observed from very different points on the globe, and appear accordingly, and according to their distance at different places in the heavens. The astronomer, however, considers himself at the centre of the globe, calculates the place of the heavenly body with reference to this imaginary place of observation, and calls the place thus found the *true* or *mean*, in contradistinction to the *apparent* place, observed from the surface of the globe. If the heavenly body were seen precisely in the horizon, and if we suppose, at the same time, another line of view drawn from the centre of the earth to the same body, these two lines of view would include, with the radius of the globe, a right-angled triangle, in which the angle at the heavenly body would be its horizontal parallax, and the hypothenuse the distance of the star from the centre of the earth. From this horizontal parallax, therefore, we may calculate the distance of the heavenly body according to trigonometrical laws. The horizontal parallax, it is true, cannot be observed directly, but the parallax of altitude can be so observed. This expression designates the angle at the star, when elevated above the horizon. From the parallax of altitude follows the horizontal parallax, and hence the distance.—See Bode's *Introduction to Astronomy*, 3d edit. (Berlin, 1808, vol. i. sect. 542 et seq.)—It ought to be added, that this parallax is called the *daily*, in contradistinction to the *annual*, by which, in general, is understood the difference of the place of a heavenly body as seen from the earth and from the sun; particularly, however, the angle formed by two lines from the ends of the diameter of the earth's orbit to a fixed star, which angle, on account of the immense distance of the fixed stars, is too small to be ascertained. See *Fixed Stars*.

PARALLELISM OF THE EARTH'S AXIS is used to denote that invariable position of the terrestrial axis by which it always points to the same point in the heavens, abstracting the trifling effect of nutation, &c. See *Nutation*.

PARALLEL LINES, in mathematics; two lines which, continued *ad infinitum*, never approach, or remain always at the same distance. The theory of parallels is of the highest importance in mathematics, being an essential element of most demonstrations; yet, though every thing asserted of them in mathematics is evident, the strict demonstration of the theory has given mathematicians great trouble, and not a few have lost much time, and some even their reason, in the attempt. In this respect, the theory of parallel lines is somewhat like that of the squaring of the circle.

Parallel is often used metaphorically, to denote the continued comparison of two objects, particularly in history. Thus we speak of drawing an historical *parallel* between ages, countries, or men. Plutarch wrote biographical *parallels*. *Parallel passages* signifies passages which agree in import; as, for instance, the parallel passages in the bible.

Parallelism, in Hebrew poetry, is the correspondence of two successive lines in imagery, sense, or grammatical construction.

Parallel circles, or *circles of latitude*, are those circles which run parallel to the equator, and become therefore smaller and smaller towards the pole. See *Latitude*.

Parallel lines, in sieges, are those trenches which generally run parallel with the outlines of the fortress. They serve as places for concentrating the forces to be directed against the fortress, and are usually three feet deep, from nine to twelve feet wide, and of a length adapted to the circumstances of the case. Generally three parallel lines are requisite before a breach is made, the most distant of which is from 600 to 900 paces from the covered way of the fortress; and the last receives the apparatus destined to effect the breach, and is made on the glacis itself. The communication from one to the other is effected by means of ditches. Vauban first made use of them in 1763, at the siege of Maestricht.

PARALLELOGRAM OF FORCES is a term used to denote the composition of forces, or the finding a single force that shall be equivalent to two or more given forces when acting in given directions.

PARALLELOPIPED, in geometry; a regular solid, comprehended under six sides or parallelograms, the opposite ones of which are similar, parallel, and equal to each other.

PARALLEL SAILING, in navigation, is the sailing under a parallel of latitude. See *Navigation*.

PARALOGISM, in logic; a false reasoning, or a fault committed in demonstration, when a consequence is drawn from principles that are false, or, though true, are not proved; or when a proposition is passed over that should have been proved by the way.

PARALYSIS. See *Palsy.*

PARAMATTA. See *Observatory.*

PARANA RIVER. See *Plata, La.*

PARANYMPH. See *Marriage.*

PARAPET, in fortification; an elevation of earth, designed for covering the soldiers from the enemy's cannon or small shot.

PARAPH; a particular character or flourish added to the signature of a person, to render the counterfeiting of it more difficult. With some nations they have gone out of use. With others (e. g. the Spaniards) they are as customary, and take as much room as in the middle ages; indeed, they often affix the paraph, without the name, to official papers.

PARAPHERNALIA are the woman's apparel, jewels, and other things, which, in the lifetime of her husband, she wore as the ornaments of her person, to be allowed by the discretion of the court, according to the quality of her and her husband. The husband cannot devise such ornaments and jewels of his wife, though, during his life, he has power to dispose of them. But if she continues in the use of them till his death, she shall afterwards retain them against his executors and administrators, legatees, and all other persons, except creditors, where there is a deficiency of assets.

PARAPHRASE; the setting forth of the sense of a writing in a more clear and ample manner than it is given in the original. When the original is in a foreign language, the paraphrase differs from a mere translation, in the circumstance, that the object of the paraphrase is always to explain or to develop more fully the meaning of the original. A paraphrase of the Lord's prayer, for instance, is a composition in which the ideas of the prayer are applied more particularly to the duties of life, or set forth more in detail.

PARASANG; an ancient Persian measure, different at different times, and in different places, being sometimes thirty, sometimes forty, and sometimes fifty stadia, or furlongs.

PARASELENE; a mock moon, seen usually in a ring round the moon. See *Optics.*

PARASITES, or PARASITICAL PLANTS, in botany; such plants as are produced out of the trunk or branches of other plants, from whence they receive their nourishment, and will not grow on the ground; as the misletoe, &c.

PARASOL. It appears, from ancient monuments and descriptions, that this well known instrument, or something exceedingly resembling it, was used among the ancients, not for the purpose so much of preservation from the rays of the sun as in religious ceremonies and processions. In the festivals of Ceres and Minerva, the young females who celebrated them bore, among other sacred instruments, the parasol: it was, in fact, one of the most ancient marks of dignity that we find indicated either by relics of art or by authors. In process of time, when the Romans began to lay aside the simple habits of their forefathers, the parasol, by a natural transition, began to be used for the purpose to which it is still applied. The matrons, particularly, used to be followed by slaves, whose office was to protect the delicacy of their charms by intercepting the solar heat by the agreeable shade of the parasols. They were constructed of wands, or twigs, disposed in such a manner as to admit of their being put up or down, in much the same way as those used at the present day. The substance employed was often of rich stuff, such as silk, &c., of showy colours, and elegantly embroidered. In many countries, where the sun is powerful, it is well known that parasols are used by men, as well as women.

PARCÆ. See *Fates.*

PARCHMENT, used for writing, is prepared from the skins of sheep and goats. These, after being steeped in pits impregnated with lime, are stretched upon frames, and reduced by scraping and paring with sharp instruments. Pulverized chalk is rubbed on with a pumice-stone resembling a muller, which smooths and softens the skin, and improves its colour. After it is reduced to something less than half its original thickness, it is smoothed and dried for use. Vellum is a similar substance to parchment, made from the skins of very young calves. Next to the papyrus, the skins of animals, in the form of parchment and vellum, were extensively used for writing by the ancients from a remote period. When Eumenes, or Attalus, attempted to found a library at Pergamus, 200 years B. C., which should rival the famous Alexandrian library, one of the Ptolemies, then king of Egypt, jealous of his success, made a decree prohibiting the exportation of papyrus. The inhabitants of Pergamus set about manufacturing parchment as a substitute, and formed their library principally of manuscripts on this material, whence it was known among the Latins by the name of *Pergamena.* The term *membrana* was also applied by them to parchment. The Hebrews had books written on the skins of animals in David's time; and Herodotus relates that the Ionians, from the earliest period, wrote upon goat and sheepskin, from which the hair had merely been scraped off. These facts show that parchment was not invented at Pergamus, but it was much improved there, and first made in large quantities as an article of trade. Parchment was at first yellow; it was afterwards made white in Rome. At present any colour can be given to it.

PARDO, EL; a pleasure-palace of the kings of Spain, three leagues N.W. of Madrid. It was built in the reign of Charles V., and is adorned with frescoes, pictures, and statues. It contains apartments for all the royal family, a chapel, and a theatre, and has fine gardens attached to it. The forest of the Pardo is fifteen leagues in circuit.

PARDON. In England, in all cases of crimes, except where there is an impeachment, a pardon from the crown may be granted before a trial, as well as after; and it stops further progress in the inquiry and prosecution at whatever time it is granted. In cases of impeachment, no pardon can now be granted by the king while the prosecution is pending; but, after conviction of the offender, it may be granted, as in other cases. This is in virtue of the act of settlement of the crown, 12 and 13 William III., ch. 2. In America, the constitution provides, that the president "shall have power to grant reprieves and pardons for offences against the United States, except in cases of impeachment." The senate has the whole power of trying impeachments. It is presumed, therefore, that an act of congress only can give the benefit of a pardon in cases of impeachments, if such power exists in any department of the government. By the same constitution, "judgment, in cases of impeachment, shall not extend further than to removal from office, and disqualification to hold and enjoy any office of honour, trust, or profit, under the United States." The party remains, nevertheless, liable to indictment and punishment for the offence, by the common law tribunals, as in other cases. Similar provisions exist generally in the state constitutions, or state laws, throughout the Union. In German jurisprudence, the word *abolition* is used to signify an act of mercy on the part of the sovereign, releasing some one from a deserved punishment without examination, or putting an end to a trial already commenced, before a judgment, determining the guilt or innocence of the accused, has been pronounced. This prerogative of the sovereign is limited, in several states, by the constitution, particularly in cases of public impeachment against officers of the state; for instance, in Wurtemberg. In Bavaria, abolition, after the trial has commenced, is, in all cases, unconstitutional. In several countries, the prince has the right of stopping a process already commenced, for an uncertain time, and keeping it undecided, which is called *Sistirung*. The king of Prussia availed himself of this arbitrary power but a few years ago, in the case of an action brought by a citizen against one of his officers for slander.

PARÉ, AMBROISE, the father of French surgery, was born in the beginning of the sixteenth century, at Laval, and studied at Paris. In 1536 he accompanied René de Mont Jean during his campaign in Italy, and, in 1552, became surgeon to Henry II., under whose successors (Francis II., Charles IX., and Henry III.,) he held the same post. His enemies were numerous among the physicians, who accused him of having poisoned Francis II.; but Paré, having cured Charles IX. of a dangerous wound, established himself so strongly in the favour of the court, that Charles allowed him, though a Protestant, to escape the massacre of St Bartholomew, by taking refuge in his own apartments. He died at Paris, in 1590. We are indebted to him for improvements in the treatment of gun-shot wounds, and in the operation of trepanning. He also restored the practice of tying up divided arteries, operated on articular concretions, &c. His works appeared in French, in 1561; in Latin, in 1582.

PAREGORIC ELIXIR. Paregoric is a preparation of opium, and has different names in the pharmacopœias of different nations. It is quite a popular medicine, and is much used by nurses as a palliative in many of the lighter, but more or less painful maladies of infants. As, however, there is some uncertainty about the effects of opium, in all cases, and as there is much in the constitution of infants to increase this uncertainty, in the use of this and almost all medicines, it is the safest course never to give paregoric, or any other preparation of opium, in their diseases, unless under the direction of a physician.

PARENT AND CHILD. The duty of maintaining and educating a child naturally falls upon the parent; and this precept of the law of nature is recognised and enforced among all nations. The laws of the Athenians enforced the duty of the parent towards the child, so far as to prohibit the disinheritance of the child, but for reasons to be approved by a magistrate; and the laws of some modern countries restrain the right of the parent in disposing of his property by will, or during his life, so as to defeat the inheritance of his children. The laws of England, and those of the United States (whose code is founded upon the common law of England), only require the parents to maintain the child during his minority, or until he arrives at the age of twenty-one years, or such other age as is fixed upon as that of majority, unless afterwards the child is unable to maintain himself, in which case the laws more generally, if not universally, in civilized states, impose upon the parents, or other relatives, the duty of maintaining him; and so, *vice versa*, in case of the parents being unable to maintain themselves, the law imposes the duty upon the children. This law, enjoining the duty of maintenance reciprocally between parents and children, and extending it, in certain cases, to other relatives, is founded partly on the motive of exonerating the public from this charge. Such is the ground of the provision in those countries and states in which the common law of England is the foundation of the system of jurisprudence. But in many countries, of which the legal system is engrafted on the civil law, the regulations are extended more minutely to the mutual rights and obligations of members of the same family. The father has the right of custody and control of his children, and is entitled to their service and obedience, unless he is insane, or, by some act or circumstance specified by the laws, forfeits, or is deprived of these rights; for the child, though to many purposes under the dominion of the father until the age of majority, is not absolutely so; on the contrary, the law recognises the existence of the child, and extends protection to it, not only from the time of the birth, but even before; for a child may inherit an estate that descends during the time of the mother's gestation. In case of the gross abuse of the parental authority, or egregious disqualification of the parent for the office of guardian, the law extends its protection to the child by the appointment of another guardian. All systems of laws do not agree as to what circumstances give proper occasion for the substitution of another guardian in the place of the parent. The insanity or idiocy of the parent, which divests him of all moral or legal capacity or responsibility, will, of course, under all laws, exempt the child from all duty of obedience. The laws also usually make provision for cases of abuse and extreme cruelty on the part of the parent. In case of the decease of the father, the law transfers his authority over his children to the mother, but usually with some qualifications and limitations, making a distinction, in this respect, between sons and daughters, giving the mother a more extended authority over the daughters, for the obvious reason that she is supposed to be more capable of governing them, and superintending their education. The laws relating to the mutual rights and duties of parents and children, are obviously a very important part of every code, and have a very intimate connexion with the state of society, and with civil institutions. The welfare of the community is, for instance, directly and deeply affected by the education of youth, and one object of every code is to encourage such a course of education as may form good citizens. Solon provided, for this purpose, that a child, not educated by the parent, to some art or trade, should not be obliged to support the parent in old age. In ancient times, when paternity was a great foundation of civil authority, the parental rights were much more absolute than in the modern, extending, in some countries, to the right of life and death, and continuing during the life of the two parties. The Persians, Egyptians, Greeks, Gauls, and Romans, allowed to fathers a very absolute dominion over their children. Among the Romans, it was not an absolute power of life and death, but a regulated domestic jurisdiction, gradually softened by the progress of refinement. Bynkershoeck thinks the power of life and death, on the part of the father, ceased during the reign of Adrian. In the time of Constantine, the putting to death an adult child, by the parent, was made a capital crime. No such power is permitted among modern civilized nations, as we have already seen; but provisions are made, by law, to prevent and punish cruelty on the part of the parent. But the law every where allows the parent to inflict moderate chastisement on the child—a liberty which must be given, in order to secure authority on one side, and obedience on the other. The more general time of majority of the child is the age of twenty-one years, when he is liberated from the authority of the father. This is the age of majority in England and the United States; and it is so now, also, in France, though it formerly commenced there at the age of twenty-five.

PARERE; in some countries, the written decision of impartial merchants on litigated points, concerning which parties wish to know their opinions.

PARGA; a seaport on the coast of Albania, opposite the southern point of Corfu. At the time of the fall of the Roman empire, this city was built on a rock, washed on three sides by the sea, and forming in the rear a steep cliff, the summit of which was crowned by an almost impregnable citadel. The city lies at the mouth of a river (the Acheron of the ancients). It is surrounded with walls, and contains two harbours, formed by a small island, and protected by a battery. The prospect from the citadel is magnificent. The neighbouring country is fertile, and the district belonging to the city is separated from the limits of Albania by a chain of elevated mountains. Parga is hardly mentioned in history till 1401, when it entered into an alliance with Venice, which continued till the fall of Venice, in 1797. Being independent of Ali Pacha, the tyrant of Albania, it was the asylum of all who sought to escape his fury, and became the seat of frequent intrigues against his government. Ali Pacha therefore desired to get possession of it. In 1798, he found means to reduce Prevesa and the other fortresses on the neighbouring coast; but Parga set his arms at defiance. The Pargiots repelled his attacks till 1814, when they applied to the British in Corfu, and received a garrison from them, with the expectation of being incorporated with the republic of the Ionian islands; but the British government refused to receive the submission of the Pargiots. They did not overlook the importance of Parga to Corfu; but the dread of constant hostilities with the Albanians led them to enter on negotiations with Ali; and he was put in possession of Parga on condition of his paying a pecuniary indemnity to those inhabitants who should choose to change their residence. The population consisted of about 5000 Albanian Greeks. The surrender to Ali took place in 1819, and almost all the inhabitants emigrated to the Ionian islands, after having burned even the bones of their ancestors.

PARHELIA. See *Optics*.

PARIAN CHRONICLE. See *Arundelian Marbles*.

PARIAS; Hindoos of the impure castes of the Sutas, Vaidehas, and Chandalas, so numerous a class that Menu, in his tenth chapter, has not even taken the trouble to enumerate them. The fourth caste, or Sudras, is widely separated from the three privileged ones (see *Caste*); but still further removed and more degraded are the mixed and impure classes, the number of which, according to some, amounts to eighty-four. The three castes above named are the only ones called *Parias* in the code of Menu (x. 26); they are prohibited from all approach to any thing pure, as if they were infected with leprosy. (See *Hindoos*.) Heeren thinks that the difference of colour between these Parias and the higher classes shows them to have been the original inhabitants of the country, the *Helots* of the Indians, and deprived of all rights for defending their independence. See *Delavigne*.

PARINI, Giuseppe, one of the most celebrated Italian poets of recent times, was born at Busisio, a village of the Milanese, in 1729, studied polite literature and science at Milan, and devoted himself, in compliance with the wishes of his father, but contrary to his own inclination, to theology. In spite of narrow circumstances and a feeble constitution, he laboured assiduously in his studies, and early made some essays in poetry. To relieve his wants, he published a collection of these youthful productions, under the name of *Ripano Eupilino*, in 1752. It was successful, and he was admitted a member of the academy of the Arcadians at Rome. Having been appointed preceptor in the Borromeo and Serbelloni families, he was now enabled to apply himself more exclusively to his favourite studies. His familiarity with the manners of the great led him to attempt a delineation of them in a species of didactic and dramatic satire, entitled *Il Giorno* (the Day.) The *Mattino* (Morning) appeared in 1763, and the *Mezzogiorno* (Noon) two years later. This poem extended his reputation, and he was made professor of rhetoric in the gymnasium of the Brera. His lectures on the belles-lettres have been printed. The completion of the *Giorno* was often interrupted by the troubled state of Italy, but was finally effected under the title of *Il Vespero* (Evening) and *La Notte* (Night.) He died in 1799. His works have been published in six volumes (1801—1840).

PARIS; the capital of France, the second city in Europe for population, and the fourth for extent, is situated in the northern part of the kingdom, on both banks and two islands of the Seine; lat. 48° 50′ 14″ N.; lon. 2° 20′ 15″ E. of Greenwich, 20° E. of Ferro. It is 112 miles S. E. of Havre, at the mouth of the Seine; 472 N. W. of Marseilles; 304 N. E. of Bourdeaux; 225 S. E. of London. The environs do not exhibit the same variety as those of London; instead of the gardens, parks, and country-seats which surround the great capital of the world, on the banks of the Thames, Paris on several sides presents large tracts of unenclosed cornfields. The stream of life in the great streets, the crowd of wagons, carriages, and horsemen, is not so great as in the neighbourhood of London. The finest approach to Paris is by St Germain; a broad, straight street, lined with lofty buildings, leads from Neuilly to the city, where the view is terminated by the unfinished Arc de l'Etoile, which stands on an elevation; from this to the charming Champs Elysées, extends a walk about a mile and a half in length, planted with fine elms, and lined on both sides with handsome houses and beautiful gardens. You next arrive at the Place Louis XV., pass the Tuileries, with its gardens and statues, the Seine, with its bridges and quays, the Place Vendome, with its triumphal column, the Palais Bourbon, where the chamber of deputies assembles,—you are in Paris. Its circuit, as marked by a wall raised in 1787, to prevent smuggling, is about fourteen miles; its greatest breadth three miles; its greatest length somewhat above five. The original soil on which Paris is built was a marly gypsum, and a great portion of the southern part of the city is built over the immense quarries which form the catacombs. The eastern sections, the suburb St Antoine, the Quartier au Marais and the Cité are badly built. From the Cité the streets run north to the temple, and south to the pantheon, but without being broad or elegant; in recent times, the direction has been given them south to the suburb St Germain, and north to the Tuileries. The total number, exclusive of *culs de sac*, is 1142, mostly narrow. They are not so clean as they might be, since the water is carried off by only one gutter, in the centre of the street; a few of them are paved in the modern style, and provided with footpaths. The Rue de Rivoli, Rue de Castiglione, and Rue de la Paix, are handsome streets. The eighteen boulevards are broad streets, planted on both sides with trees, and forming beautiful promenades. Those outside of the walls are called the *exterior boulevards*. The interior boulevards are divided into the old, or northern, and the new, or southern, and are of great length, with many streets running into them. Many of the trees were cut down in July, 1830.

Among the finest of the seventy-four public places, are the Place Vendome, and the Place du Carrousel, which separates the Tuileries from the Louvre. The Place Louis XVI., or de la Concorde, in which is a monument erected to the memory of Louis XVI., but which has recently been consecrated to the charter, is also one of the most beautiful in Paris. The Champ de Mars, Place des Victoires, Place de Grève, before the Hotel de Ville, Place du Chatelet, Place des Vosges, &c., deserve mention. The Seine, which flows from east to west, divides Paris into two unequal parts, and is crossed by nineteen bridges. It is not more than half as broad as the Thames, and, as it is not enlivened by shipping, it presents little attraction, except in the quarter of the Tuileries. Here, on one side are the Louvre and the Tuileries, with its gardens, and on the other, from the Palais Bourbon to the Pont Neuf, a succession of fine buildings. The older bridges were all constructed at points where the river is divided by islands. The Pont Neuf has twelve arches, and is 1020 feet long; the Pont Royal, with five arches, was built by Louis XIV.; the Pont de Louis XVI., or de la Concorde, completed in 1790, has five arches; lower down the river, and opposite the Champ de Mars, is the Pont d'Jéna; and higher up, opposite the Jardin des Plantes, is the Pont d'Austerlitz, a fine iron bridge. The Pont des Arts, opposite the Louvre, is also of iron, but is intended merely for foot passengers. The last three were built during the reign of Napoleon. The Pont de l'Archeveché, of three arches, was built in 1828; the Pont des Invalides, an iron bridge, in 1829; and the Pont d'Arcole, also of iron, in 1828. The quays are forty-nine in number; they are stone embankments, on both sides of the river, and around the islands; the whole extent is about fifteen miles. The sewers fall into the river through arches under the quays. Many *passages*, or covered streets, with shops fitted up in an elegant style, have been constructed within a few years. Paris is supplied with water, partly be aqueducts, and partly from the Seine; there are eighty-six fountains in the public places and boulevards, some of which are distinguished for their architecture. The houses are generally very high (seven or eight stories), and mostly of stone. For the magnificence of its palaces, the French capital surpasses every other city in Europe. The Louvre, the Tuileries, the Luxembourg, the Palais Royal, are described in separate articles. The Palais Bourbon, on the left side of the Seine, now the place of session of the chamber of deputies; the Garde Meuble, on the Place Louis XV., designed for the safe-keeping of the crown jewels, and costly articles of all sorts; the Hotel des Invalides; the military school; the Palace of the Legion of Honour; the mint; the Hotel de Ville; the Palais de Justice; the corn market (Halle au Blé); and the new Bourse (exchange), are among the other most remarkable public buildings. Of the churches, Notre Dame, Ste. Geneviève, now the pantheon, St Sulpice, St Eustache, and St Roch are the principal. The hospitals and hospices are under good arrangements. See *Hospitals; Blind, Institutions for the; Dumb and Deaf; Sicard, Haüy, Lachaise;* and for the theatres, see the latter part of this article.

The finest public monument in Paris is the column in the Place Vendome, erected under the superintendence of Denon, in commemoration of the victories of the campaign of 1805. It is an imitation of Trajan's pillar, in Rome, 134 feet high, and 12 feet in diameter. It is of brass, and the material was furnished by the 425 cannon taken from the Austrians and Prussians in that campaign. It is covered with 378 plates of brass by Lepere, skilfully united, and containing bass-reliefs, winding round the pillar, and representing scenes of the campaign. The statue of Napoleon was removed in 1814. The triumphal arch in the Place du Carrousel is forty-five feet high, and was erected after the war of 1806. In 1815, the horses of St Mark's, which had been placed on its summit, were claimed by the Austrians, and carried back to Venice. The Arc de l'Etoile, at the Neuilly barrier, begun in 1806, is still unfinished. The gate of St Denis, a triumphal arch erected by Louis XIV., is admired for its fine proportions and its execution. In 1818, a new equestrian statue of Henry IV. in bronze, was erected on the Pont Neuf. In the Place des Victoires, there is an equestrian statue of Louis XIV. In the new quarter, called *Villa Trocadero*, on the heights of Chaillot, is an obelisk 120 feet high, in commemoration of the campaign of 1823, in Spain.

Paris has numerous public libraries, and the access to all is free. The royal library, in the Rue Richelieu, one of the first in Europe, is rich in literary treasures and rare manuscripts: it also contains a large collection of coins and medals. The library of the national institute is small but select. The Bibliothèque Mazarine, those of the arsenal of the mining school, and of the court of cassation, deserve to be mentioned. The chamber of deputies and that of peers, also, have good libraries. (See *Libraries*.) (Concerning the museum of arts in the Louvre, see *Louvre*, and *Museum*.) The museum of natural history, the richest of the kind in Europe, is in the buildings of the Jardin des Plantes. The extent of this collection, the rarity and richness of many of the specimens, and the excellent arrangement of the whole, deserve all praise. The garden itself, and the menagerie attached to it, are not less worthy of attention. The museum of French monuments was intended for the preservation of the memorials of French history, taken from the different monasteries, churches, and public buildings, at the time of the French revolution (see *Lenoir*); but after the restoration, this collection was broken up. The conservatory of arts and manufactures is a large collection of models, of high interest to every artist. Paris is also the literary capital of France. At the head of the public literary institutions is the national institute. (See *Institute*.) At the Bureau des Longitudes are the most distinguished astronomers and geometricians. Numerous learned societies are devoted to the cultivation of particular departments—medicine, surgery, agriculture, the fine arts, manufactures, &c. The university of Paris, abolished during the revolution, but restored by Napoleon, is divided into five faculties—theology, jurisprudence, medicine, philology, and natural science. The lectures are gratuitous; the number of students is about 4000. There are also in Paris four lyceums, called *colleges*—those of Louis XIV. and Henry IV., the College Bourbon, and that of Charlemagne. The Collège Royal de France has professors of mathematics, astronomy, chemistry, history, law, Oriental languages, &c. The school for medicine and surgery is a well endowed institution. In the Jardin des Plantes, and the museum of natural history, thirteen different courses of lectures on zoology, mineralogy, geology, botany, &c., are delivered. In addition to these institutions, there is also a school for the fine arts. The normal school is designed for the education of instructers in the secondary schools throughout the kingdom; the military school for the education of 500 youths, whose fathers have fallen in the service of their country; the polytechnic school, a favourite project of Napoleon, for the education of engineers, architects, &c. The veterinary school at Alfort also deserves to be mentioned. There are also numerous private societies, such as the four Protestant religious and philanthropic societies; the Bible society, with 120 branches; the missionary society; that of Christian morality, &c. The *société des bonnes lettres* has been known for its absolute monarchical principles; that of the *Athénée de Paris* for its constitutional principles. Some of the most noted prisons are the Conciergerie; La Force; St Pelagie, in which are confined persons guilty of political offences; the Madelonnettes, for females; the

Bicétre, where criminals condemned to death and perpetual imprisonment, are confined temporarily.

Various estimates of the population of Paris have been made at different periods. In 1590, although the population had been reduced by religious wars, it was about 200,000. In the latter part of the reign of Louis XIV., it was about 510,000; in 1762, it was 576,000; in 1791, it was 610,620; in 1805, it was 547,750; in 1817, 713,966; in 1827, 890,431; in 1831, 774,338; in 1836, about 1,000,000, so that it has been almost doubled in the course of thirty-one years.

Paris is divided into twelve *arrondissements*, over each of which presides a mayor (*maire*); each *arrondissement* is divided into four *quartiers*; in each quarter is a commissary of the police, and in each *arrondissement* a justice of the peace. The municipal council of Paris is the council-general of the department of the Seine, at the head of which is the prefect of the department, who, previous to the late revolution, was appointed by the crown. A prefect of the police, whose jurisdiction extends over the whole department, has the charge of the public safety and of the health department; he has under him a municipal guard, and a corps of *sapeurs-pompeurs* (firemen.) The national guard maintains the public peace of the city, preserves order, and defends the national liberties; their number is about 80,000.

The consumption of some articles of food for 1829 was as follows:—72,590 oxen; 14,500 cows; 66,580 calves; 380,730 sheep; 85,180 hogs; and others in proportion. The expenditure for the city, in 1829, amounted to 51,748,117 francs; the revenue was 51,748,547. Since the beginning of the present century, the manufactures of Paris have rapidly increased, and it is now the principal manufacturing city in the kingdom. The value of exports for 1829 was 42,493.341 francs. Among the principal articles manufactured are—

	Francs.
Salts, acids, and oxides, to the amount of	3,500,000
Refined sugar,	28,300,000
Cotton goods,	18,200,000
Silks and cashmeres,	12.500,000
In horology,	19.765,000
In typography,	8,800,000
Bronzes,	5,250,000

&c., &c. All sorts of articles of luxury and fashion are made with the greatest elegance and taste. It is estimated that 40,000 letters leave Paris daily, and 30,000 arrive during the same period. Numerous diligences (900) run to all quarters of the kingdom, and a ready communication between all parts of the city is kept up by the fiacres, omnibuses, favourites, cabriolets, &c., &c.

Those who suppose Paris to be merely a theatre of frivolity and amusement will find themselves much mistaken. That, in a population of about 1,000,000, of which above 50,000 are strangers who resort to Paris merely for pleasure, there should be a great number of licentious individuals, is to be expected; but who would judge of the character of the Parisians from the public promenades of the Palais Royal? The truth is, that, in these haunts of vice, the greatest number of visitors are the strangers. In the higher classes, there is little difference in the character of society throughout Europe. In Paris, however, it is distinguished for delicacy, polish, refinement, and ease. The middling class in Paris, as in all France, is strongly characterized by the strictness and elevated tone of its manners. The lower class is industrious, but improvident, and shows none of that ferocity which the excesses of the revolutions of 1789 lead some people to expect; and the events of the revolution of July, 1830, exhibit the Paris populace in a very favourable light. Gayety, wit, intelligence, with decency and politeness of manners, are common to all classes of the French, particularly of the Parisians. The women in France have a great influence on the character of society, and are distinguished for their grace and fascination of manner.

Among the best French works on Paris are Dulaure's *Histoire civile, physique et morale de Paris* (3d edit., 8 vols., with plates, Paris, 1825); the *Description de Paris*, by the same; Mercier's *Tableau de Paris*, well done, and witty, but antiquated; Jouy's *Mœurs de Paris*, under the titles of *L'Hermite de la Chaussée d'Antin*, *Le franc Parleur*, &c.; Landon's *Description de Paris*; Lachaise's *Topographie Medicale de Paris* (Paris, 1822); count Chabrol's *Recherches statistiques sur la Ville de Paris*, &c.; the annual *Itinéraires*, &c.

Paris, History of. A Gallo-Celtic tribe, the Parisii, built the ancient Lutetia, on a swampy island in the Seine, before the birth of Christ. The name *Lutetia*, or city of mire, is said to have been given to the place on account of its muddy character. The inhabitants burned it when the Romans invaded Gaul. The latter rebuilt Lutetia, fortified the place, erected an aqueduct leading to it, and founded warm baths (*thermæ*). But Lutitia remained insignificant until the emperor Julian (360 A. D.) went into winter quarters there, and built a palace for himself. In 486, the Franks conquered it, and made it, in 508, the capital of their kingdom. Clovis embraced the Christian faith, and lived in the palace of the *thermæ*, of which ruins are found to this day in the street Laharpe. Clotilda, his wife, completed the church Ste. Geneviève, which he had begun. About 550, Childebert commenced the building of Notre Dame; 100 years after, St Landry founded the hospital Hotel Dieu. Towards the end of the eighth century, Charlemagne instituted the schools from which at a later period sprung the university. In 845, the Normans besieged the city, and burned it about 857. After Hugh Capet, count of Paris, the first king of the third race, ascended the throne, in 987, Paris remained the residence of the kings, until Louis XIV., whom the Fronde (q. v.) had driven from the capital in 1649, made Versailles the royal residence. Hugh Capet resided in the present Palace of Justice. The place increased, and was divided into four quarters. Under Louis the Fat, not more than about twelve francs of taxes were collected monthly at the northern gate, in the neighbourhood of the present street St Martin. In 1163, bishop Maurice de Sully erected the cathedral of Notre Dame, as it is still to be seen. In the same century, the Templars built their palace on the square, where at present is the market du Temple. In 1190 Philip Augustus, who had caused Paris to be paved, ordered a third enlargement, and divided the city into eight quarters. Until that period it had but three gates; now, it received fifteen. In the thirteenth century, St Louis founded the hospital of the Quinze Vingts for the blind, and a number of convents. After the abolition of the order of the Templars, in 1312, Philip the Fair, in 1314, caused the grand master Molay and several knights to be burned in the Place Dauphine (so called at least before the revolution of 1830; whether the name has been since changed, as inconsistent with the new order of things, we know not). Under Philip of Valois, Paris contained 150,000 inhabitants. The *black death*, so called, which ravaged Europe about the middle of the fourteenth century, destroyed half of the inhabitants. About this time, the Hotel de Ville, on the Place de Grève, was begun. In 1367, the fourth enlargement of Paris took place, under Charles V. Paris was now divided into sixteen quarters. Twenty years later, the Bastile was begun. Until that time Paris had two bridges; one towards the north, Le

Pont au Change; the other towards the south, Le Petit Pont. In 1378, the third, Le Pont St Michael, opposite the present street Laharpe, was built. The fourth bridge, Pont Notre Dame, was built soon after. In 1418, Paris was visited by famine and pestilence. 100,000 people perished in three months. In 1420, the capital of France was taken by the English. Charles VII. drove them out in 1436. In 1465, some attempts, though very imperfect, were made to light the streets at night. Under Louis XI. Paris contained 300,000 inhabitants. In 1563, the Jesuits established themselves there. Under Francis I., the fifth increase of Paris took place. Henry IV. besieged Paris; the city surrendered in 1594, and Henry made a triumphal entry. Henry IV. completed, in 1604, the Pont Neuf, begun by Henry III., in 1578. In 1614, the equestrian statue of Henry IV. (the first monument of this kind in France) was erected. In 1615, the palace Luxembourg (q. v.) was begun; in 1629, the Palais Royal (q. v.), in its old form; and in 1635, the Jardin des Plantes. Louis XIV. enlarged the city, and did much for the embellishment of it. In 1664, the Tuileries, begun by Catharine of Medici, were completed; in 1665, Perrault built the colonnade of the Louvre; and almost at the same time, the Hotel des Invalides (q. v.), the observatory, the gate St Denis. Under Louis XV. the Ecole Militaire was erected, and the church Ste. Geneviève completed. In 1763, the city erected the statue of Louis XV. on the place of his name, and a number of magnificent buildings. The revolution interrupted the embellishment of Paris, which Napoleon, zealous as he was to make the French nation the ruling power of Europe, and Paris the capital of the world, pursued with ardour, and accomplished a great deal.—A history of Paris is to a considerable degree a history of France, so much has this city, during the last centuries, concentrated in itself all the vital action of France. This has had several good and many evil consequences (see *City*); and true liberty, the life-blood which should animate all parts of the body politic, cannot be domesticated in France until the departments and provincial towns have resumed their proper importance. The preponderance of Paris over all France, not only in a political sense, but in literature, arts, customs, &c., is immense, and was most strikingly manifested during the revolution of the last century. (See *France*.) March 31, 1814, the taking of Paris concluded the campaign of the allies against Napoleon. The congress of Chatillon had been broken up. (See the article *Chatillon*, which contains, also, the chief events of the campaign from that time to the battle before Paris, March 30, 1814.) 30,000 men under Marmont, Mortier, and Compans, with 150 cannons, occupied the fortified heights before Paris, in a semicircle, from Charenton and Nogent on the Marne to Neuilly on the Seine. By degrees 120,000 men were brought against them. With the break of day on the 30th, the battle began. After an obstinate struggle, the allies succeeded in taking the heights of Belleville; the village Lavillette was taken by assault, whilst other troops advanced through Neuilly on the Marne and Nogent sur Marne towards Vincennes, where the bridge of Charenton was taken by assault, and where 150 *élèves* of the veterinary school of Alfort died a heroic death. Blucher, at the same time, drew near, passing through St Denis, and Montmartre was taken by assault at three o'clock in the afternoon. Marmont, in the mean time, had proposed an armistice to general Schwartzenberg, which was concluded at three o'clock. At six o'clock, counts Nesselrode, Orloff, and Paar, went to Paris, where the conditions of surrender were concluded on the 31st, at two o'clock in the morning. The corps of Marmont and Mortier were to leave Paris at seven o'clock, and hostilities were not to begin before nine o'clock. The city was recommended to the mercy of the allies. The victory of Paris cost the latter 9000 men; the French lost 4000, besides the prisoners, and 109 cannons. The troops of the allies were kept under strict discipline. The French made loud complaints of outrages, both in prose and verse; but, though it is impossible that so large an army should take possession of a hostile city without some cases of violence, the behaviour of the armies must be allowed to have been very strictly regulated, particularly if compared with that of the French armies in Vienna, Berlin, and other great cities, where cruelty was added to injury. The French even went so far as to complain bitterly of the allies for taking the works of art which Napoleon had carried from their countries.—See, for the military movements, Koch's *Mém. pour servir à l'Hist. de la Camp. de* 1814 (Paris, 1819, 2 vols.)—When, after a series of the grossest blunders on the part of the Bourbons, Napoleon returned to Paris in 1815, and lost the battle of Waterloo, Davoust received the command of about 60,000 men for the defence of Paris. It was difficult to attack the city, as formerly, from the north and east, because the heights and villages were fortified, and well supplied with artillery. The British therefore remained before these lines, and the Prussians passed over the Seine to attack Paris from Versailles. The city is weakest on this side, and might also be forced to surrender by cutting off all the supplies of provisions which come from Normandy. On June 30, therefore, the first and third Prussian corps marched to St Germain; the fourth remained in its former position until the arrival of the British; and, on July 2, the third corps marched through Versailles to Plessis Piquet, the first through Vaucresson to Sèvres and Meudon; the fourth, which was to act as a reserve, was placed at Versailles. The enemy had been driven back at Sèvres and Plessis Piquet, as far as Vaugirard and Montrouge, and had occupied Issy. A council of war, held at Paris, almost unanimously determined that Paris was untenable; but in order to make a last attempt, Vandamme advanced, on the morning of the third, with 10,000 men, and attacked Issy. He was repulsed after several hours' fighting, and the surrender of Paris was resolved on. The capitulation was concluded at St Cloud the same day. The French army was to leave Paris within three days, and cross the Loire within eight days: Montmartre was to be surrendered, July 5, and all the barriers on the 6th. July 7, the Prussian army entered the barrier of the military school, and part of the British army that of St Denis. Louis XVIII. arrived the next day.

To what has been said in the article *France* respecting the revolution of 1830, we only add, as concerning Paris more especially, that, during that short and memorable revolution, the greatest part of the street lamps were broken; 4055 barricades thrown up with great rapidity, consisting of the pavement torn up for the purpose, of coaches and other vehicles, trees, &c.; 3,125,000 paving-stones were dislodged, and the paving the streets again cost 250,000 francs. The pavement of Paris consists of large stones.

Treaties concluded at Paris. 1. Peace between France and Spain on one side, and Great Britain and Portugal on the other, concluded February 10, 1763, which ended the seven years' war. France ceded Acadia (Nova Scotia), and Canada and Cape Breton to Britain; but she retained the right of fishing on the banks of Newfoundland. Great Britain restored Guadaloupe, Martinico, and St Lucia, to France, but retained Grenada, Dominica, and Tobago, also the colony on the Senegal and Minorca. To Spain she restored Havana, but received all Florida from Spain, while France ceded Louisiana to Spain.—2. Peace concluded, September 3, 1783, by Great Britain with France, Spain, and the United States, after several preliminary treaties, and on May 20, 1784, with the United Netherlands. Great Britain acknowledged the independence of the thirteen United States; France received back with St Lucia the other colonies, and retained Tobago and Senegal; Spain retained Minorca, and received back Florida; the Dutch were obliged to leave Negapatam in the hands of the British.—3. The peace of May 30th, 1814, consisting of four separate treaties of France with Austria, Russia, Prussia, and Great Britain. (See *France since* 1814.) The German states were to be united in a federative system; Switzerland's independence was guaranteed; the house of Orange was to reign in the Netherlands, and Belgium to be added to its dominions, &c.—4. Peace or treaty of November 20, 1815. (See *France since* 1814.) On the same day, Austria, Russia, Great Britain, and Prussia, renewed the treaty of Chaumont (q. v.), and united for the maintenance of the second peace of Paris—that of November 20, 1815. The two last treaties are often spoken of as the "first and second peace of Paris."

Paris Theatres. (For the history of the French drama, see the article *France*, division, *Dramatic Art and Poetry*.) In genteel comedy, comic opera, and the lighter comedy, the French stage is inimitable; and a visitor in Paris cannot fail to observe the delicate taste of the Parisians in every thing relating to the stage. The Parisian, in his principal theatre, witnesses the constant repetition of the masterpieces of his classic poets, with an occasional novelty in the same style, and is satisfied if the actors perform their parts well; but his judgment of their performance is strict, and his criticism severe. There is no city where the people attend the theatre so regularly. The British and German theatres are much below the French in delicacy and refinement: any thing low or vulgar is instantly condemned in a Paris theatre, and the highest regard is paid to the modesty of the female sex. The constant noise which is heard in the British and German boxes is unknown in France; the most popular pieces are never interrupted by loud bursts of applause. The police prevent confusion at the entrances, and each person stations himself *à la queue* of those already collected; that is, each stands behind another, so that several files are often formed; and no one is suffered to leave his position till the doors are opened. The number of theatres in 1830 was twenty-four. The principal are supported by the government; among them are, 1. The grand opera (*Académie Royale de Musique*.) The richest decorations, an enchanting ballet, splendid costumes, beautiful scenery, and a powerful orchestra of 200 musicians,—are all here united to bewilder the senses. The French heroic opera with ballets, the *opera seria*, and some pantomimic ballets, are represented here. The serious French vocalism can never be agreeable to an ear accustomed to Italian and German music, especially when it is carried to excess, as is often done in this theatre. The rhythmical recitatives and the choruses are more pleasing. On this stage, the operas of Gluck and Sacchini are, as it were, at home; and no where else in Europe have they been represented in such perfection. The dances which accompany the grand operas, and the grand pantomimic ballets which follow the opera, excel every thing of the kind, except the grand Italian opera in London. On no other stage on the continent is the ballet, as a whole, so complete as in the Paris grand opera. The beautiful opera house in the rue Richelieu was closed after the assassination of the duke of Berri, in 1820, and finally taken down. The present opera house in the Chaussée d'Antin was opened in 1821; it accommodates 2000 persons. The most celebrated singers and dancers in the records of this theatre are Mad. Guimard, St Huberty, Arnauld, Armand, Branchu, Madlle. Gardel, and MM. Lais, Lainez, Vestris, Gardel, Milon, and Duport. The most eminent recent performers have been MM. Nourrit, Derivis, Dabadie, Bonel, Prevost, and Mad. Grassarie, Dabadiè, Sainville. The best female dancers were Mad. Bigotini, Hulin, Anatole, Albert, Marinette, Fanny Bias, Elie, Noblet; and the male dancers MM. Paul, Albert, Noblet, Milon, Montjoie, Capelle, Coulon, Gosselin, &c. 2. *Théâtre Français* properly called *Premier Théâtre Français*), in the rue Richelieu, is connected with the Palais Royal. It was first opened in the Hotel Bourgogne, in the year 1518. In 1650, Molière became an actor there. In 1689, it was removed to the rue Fossés St Germain; in 1770, to the Tuileries; in 1782, to the Odeon; and, in 1799, when this was burnt, to the present edifice, built by Louis. The interior is a sort of circus. The gallery is supported by twenty-six Doric columns, which form a complete semicircle around the pit; and between these columns are the boxes. The theatre was erected in 1787—89, and in 1822, the interior was wholly new-modeled, under the direction of Percier and Fontaine. The repertory of this stage consists solely of acknowledged masterpieces of French classic literature, ancient and modern, both tragedy and genteel comedy. It is very seldom that a young actor ventures to attempt both these branches, and hence the actors are generally attached to one or the other exclusively. The immortal *chef-d'œuvres* of Corneille, Racine, Voltaire, Crébillon, and Molière are here performed. Genteel comedy seems here to be in its native home. Truth, and nature, and elevated simplicity, conspire to make the performances attractive and interesting. The scenery is truly enchanting. The following performers have rendered their names classic here:—Baron, Brizard, Lekain, Clairval, Molé, Larive, Fleury, Aufresne, Dufresne, Grandmenil, Grandval, Monvel, St Phal, Preville, St Prix, Vanhove; and the actresses Lecouvreur, Gaussin, Dumesnil, Clairon, Devienne, Contat, Raucourt. The tragic department is now in the hands of Lafont, and Mad. Duchesnois and Paradol; the comic in those of Damas, Faure, Granville, Michelot, Baptiste, Michot, and Armand, in connexion with Mlle. Mars (one of the first actresses that ever graced the French stage), Mad. Bourgoing, Leverd, Hervey, Dupuis, and Mante. 3. The comic opera (called, also, the *Comédie Lyrique* and the *Théâtre Feydeau*) is one of the most fascinating of the French theatres. The principal composers for this opera have been Nicole, Méhul, Berton, Grétry, Dalayrac, Monsigny, Boyeldieu, Blangini, Solié, Dezedes, &c.; the principal writers Etienne and Hoffman, Bouilly, Nanteuil, Sedaine, Duval, Dupaty, Scribe, &c. Among the best actors are Martin, whose performances, in his own department, are inimitable; Chenard, Juliet, Ponchard, Huet, Darancourt, Castel; and Mesdames Boulanger, Ponchard, Paul, Pradher, Rigaud, &c. 4. *L'Odéon*, or *Second Théâtre Français*, in the suburb St Germain, near the Luxembourg, was built in 1791, under the superintendence of Peyre and Wailly. It was then called the *Théâtre Français*, as the first company to which that name had been given performed in it. In 1799, it was burnt, but was rebuilt, and occupied by a second company, set up to rival the first French theatre; it was then called *Théâtre de l'Odéon*. In 1818, it was again burnt, but was re-opened in 1819. The architecture of the *Odéon* is rich and beautiful, and its accommodations are excellent. The same pieces are performed as in the *Premier Théâtre Français*, and the two stages are engaged in a constant competition. The older repertory of the classic French dramatists is open to both theatres. Of the living poets, each stage has its distinct repertory. Mademoiselle George is the chief support of the *Odéon*. In the characters of Medea, Semiramis, Phædra, Merope, Agrippina, and Salome (in *Les Machabées*, by Soumet), this actress attracts the highest applause. In tragedy Joanny, Lafargue, and David, and in comedy, Faure and the younger George, are the principal actors. 5. Italian Opera. This theatre attracts the first society in the fashionable world of Paris. The interior is convenient and beautiful. The orchestra is considered perfect of the kind. The Italian opera is patronised by the government, as a school of vocal music, and the managers are careful to maintain a complete and skilful company. The public have here been delighted by the singing and acting of Mad. Fodor, Galli, Pasta, and Cinti. The best performers connected with this stage have been Dongelli, Garcia, Graciani, Pellegrini, Levasseur, Bordogni, Zuchelli.—Next to these five principal theatres come the three smaller popular theatres, frequented principally by the lower classes. 6. *Théâtre du Vaudeville*, in Chartres street. 7. *Gymnase Dramatique;* and 8. *Théâtre des Variétés*, both in the boulevards. These theatres display to perfection the exhaustless gayety of the French people; their wit, and disposition to make themselves merry at the most trifling occurrence, and to make the most of a *bon mot* or a pun. The small pieces performed in these theatres contain no deep-laid plot, and are not accompanied by any magnificent decorations. They are written merely for wit, and seem designed to increase the natural aptness of the nation to laugh at every thing. The lash of satire, indeed, is always heard, but applied for amusement, and not to gratify malice. The songs which animate the performances are of a popular cast, and are heard in every street. Nothing appears in the highest theatres which is not parodied here, and the house is frequently entertained with the tricks of harlequin. The *Gymnase* was long the most popular of these three theatres, and its income exceeded that of the first *Théâtre Française*. The *Vaudeville* is at present on the decline. A large number of poets write for these theatres. One of the most popular is Scribe. 9. *Théâtre de la Porte St Martin;* 10. *Théâtre de la Gaieté;* 11. *Ambigu Comique*, in the boulevards, represent chiefly the melo-drama, pantomime, and ballet. The two latter are designed principally for the lower ranks. 12. In 1821, the *Panorama Dramatique* was opened. No pieces are performed here in which there are more than two performers. 13. In 1817, the *Cirque Olympique* was opened by Franconi, where horses play the chief part. 14. The *Soirées de M. Comte*, likewise denominated the *Théâtre de Magie*, represents the conjuration of spirits, philosophical experiments, feats of ventriloquism, &c.

PARIS; the son of Priam, king of Troy, by Hecuba; also called *Alexander*. His mother, in the first month of her pregnancy, had dreamed that she should bring forth a torch, which would set fire to her palace. The soothsayers foretold the calamities which might be expected from the imprudence of her son, and which would end in the destruction of Troy. Priam, to prevent so great an evil, ordered his slave Archelaus to destroy the child. The slave exposed him on mount Ida, where the shepherds educated him as their own son. Some attribute the preservation of his life to the tenderness of a she-bear, who suckled him. Young Paris gave early proofs of courage and intrepidity, and his graceful countenance and manly deportment recommended him to the favour of Œnone, a nymph of Ida, whom he married. At the marriage of Peleus and Thetis, the goddess of discord (see *Eris*) threw into the assembly of the gods, who were at the nuptials, a golden apple, on which were written the words *Detur pulchriori*. Juno, Venus, and Minerva claimed the prize, and the decision was referred to Paris. The goddesses appeared before their judge without any covering or ornament, and each tried, by promises and entreaties, to influence his judgment. Juno promised him a kingdom, Minerva military glory, and Venus the fairest woman in the world for his wife. Paris adjudged the prize to Venus. This decision drew upon the judge and his family the resentment of the two other goddesses. Soon after, Priam proposed a contest among his sons and other princes, and promised to reward the conqueror with the finest bull of mount Ida, which was found in the possession of Paris, who reluctantly yielded it up. The shepherd, desirous of obtaining again this favourite animal, went to Troy, entered the lists of the combatants, and obtained the victory. Hector, enraged to see himself conquered by a stranger, pursued him closely; and Paris must have fallen a victim to his brother's resentment, had he not fled to the altar of Jupiter. Cassandra discovered that he was her brother, and Priam acknowledged Paris as his son. Paris recollected that he was to be the husband of the fairest of women. Helen was the fairest woman of the age, and Venus had promised her to him. He therefore visited Sparta, the residence of Helen, who had married Menelaus, and was received with every mark of respect; but he abused the hospitality of Menelaus, and persuaded Helen to elope with him. (See *Helen*.) Greece took up arms in the cause of Menelaus; Agamemnon was chosen general of the combined forces, and a war was begun. Paris fought with courage, and, according to some, killed Achilles with one of his arrows. The death of Paris is differently related.

PARIS, the abbé, was the son of a counsellor to the parliament, and was born at Paris in 1690. He embraced the ecclesiastical profession, and took deacon's orders, and, in the disputes occasioned by the bull *Unigenitus*, attached himself to the Jansenist party. Upon the death of his father, the abbé Paris renounced all claim to his patrimonial inheritance, in favour of a younger brother, and devoted himself to a life of poverty, living in a poor little house in the suburb of Marcel, where he passed his time in prayer and in making stockings for the poor. He died in 1727, and was buried in the churchyard of St Medard. On his death, the Jansenists used his credit to revive their sinking influence, by making his tomb the seat of their pretended miracles; and so far did the delusion gain ground, that, in 1732, it was found necessary to have the churchyard walled up. The abbé Paris wrote a Commentary on the Gospel of St Matthew; an Explanation of the nine first Chapters of the Epistle of St Paul to the Romans; on the Galatians; and an Analysis of the Epistle to the Hebrews. See *Jansenius*.

PARIS, MATTHEW, an English historian, was a Benedictine monk of the congregation of Clugny, in the monastery of St Alban's, and died in 1259. His principal work is his *Historia Major*, of which we have only remaining the annals of eight kings, from the beginning of the Conqueror's reign to the end of that of Henry III., the latter years being added, it is supposed by William Rishanger, a monk of the same monastery. It is composed with candour and impartiality. He also wrote *Historia Minor*, an abridgment of the former, which is extant in manuscript, and some other works, which are supposed to have perished.

PARIS, Plaster of. See *Gypsum*.

PARISIENNE, La, or, properly, La Marche Parisienne; a song composed by M. Casimir Delavigne, immediately after or during the French revolution of 1830. This song was, and still is, very popular, and may be compared, as to its character and the excitement which produced it, to the Marseillaise hymn. See *Marseillaise*.

PARK, Mungo; an enterprising traveller, who fell a victim to his repeated attempts to explore the interior of the African continent. His father was a farmer, and he was born near Selkirk, in Scotland, September 10, 1771. He was educated for the medical profession, and, after having studied at Edinburgh for three years, was apprenticed to a surgeon of Selkirk. On quitting this situation, he went to London, and then made a voyage to the East Indies, as assistant surgeon on board one of the company's vessels. Returning to England, he engaged in an expedition to the intertropical regions of Africa, to trace the course of the river Niger, under the patronage of the African society. He arrived on the coasts of Senegal in June, 1795, and, having made himself acquainted with the Mandingo language, commenced his journey, in the course of which he encountered great dangers; in spite of which he prosecuted his undertaking till he had reached the banks of a large river, which appeared to be the object of his researches. The state of destitution to which he had been reduced, rendered it almost impossible for him to proceed, and he therefore returned towards the coast, and arrived in England at the end of the year 1797. Of his interesting discoveries he published an account in his Travels in the Interior of Africa, in 1795, 1796 and 1797 (4to, 1799.) Mr Park then engaged in practice as a surgeon, at Peebles, in his native country, 1801. In 1805, Park was appointed by government to command a new expedition to explore the course of the Niger. His first journey had made known its easterly course (see *Niger*), but he had not been able to follow it down to its mouth. His plan now was to cross the country from the western coast, enter Bambara, construct two boats, and, embarking on the river, reach the sea. He set out from Pisania, on the Gambia, in April, with thirty-six Europeans, of whom thirty were soldiers, and the rest mechanics, and liberally provided with presents and merchandise. His impatience had led him to set out in the wet season, and of thirty-eight men who had left the coast with him, seven only survived when he reached the Niger, in August. Having finally procured permission to build a boat at Sansanding, he embarked at that place November 17. Four Europeans only survived to embark with him. Some time having elapsed without any intelligence being received of him, Isaaco, his interpreter (who had been sent back with communications from the Niger), was despatched to procure information: Isaaco succeeded in finding the person who had taken his place as interpreter, and from him received a journal containing an account of the voyage, from which it appeared, that the party was attacked by the natives at Boussa, and all killed, with the exception of one slave. Clapperton (q. v.), in his second journey, received accounts confirming this statement, and visited the spot where the travellers perished. He was also informed that the sultan of Youri had some of Park's papers, which he was willing to give up to him, if he would pay him a visit. The Landers (q. v.) also visited the place, and were shown by the sultan, or king, one of Park's books, which they describe as a nautical book, containing tables of logarithms. The Journal of Park's second Expedition was published with a memoir of his life, in 1815.

PARK OF ARTILLERY. See *Artillery*.

PARLIAMENT. The name *parliament* (French, *parlement*) was formerly given to the highest courts in France, Naples, and some other countries. They originated from the ancient diets and courts, held by the kings, which were called *parliaments*, particularly if held at extraordinary times. The barons decided legal cases, with the aid of the clergy, the magnates, and the chancellor, as was natural in times when the three branches of government were so confusedly mingled. But the kings of France soon appointed counsellors versed in the law to decide the complaints and appeals brought to their court by the inhabitants of their hereditary lands; and the same was done by the feudal princes, the dukes of Normandy, Guienne, Burgundy, Brittany, and the prince-counts of Champagne, Toulouse, Provence, &c. These counsellors were not, originally, proper judges, but merely made reports, and always followed the court. But what John of England had been obliged to promise in the Magna Charta, as early as 1215,—a permanent court confined to one place,—was, by degrees, demanded in all countries. Philip IV. (the Fair) of France, established a permanent court at Paris, in 1294, for the provinces belonging to the immediate domains of the crown, which were divided into four districts. In 1305, this institution was enlarged. In the beginning, this court held but two sessions annually, continuing, however, for weeks and months, viz. at Easter and All-Saints, but when the business of the court increased, its sessions became permanent in 1422. The vassals of the royal hereditary dominions had seats and votes in the parliament, which, at a later period, passed over to the peers of France; but the business actually fell upon the counsellors, who were lawyers. The parliament of Paris consisted, before the French revolution, of five chambers, the *grande chambre*, with ten presidents, twenty-five temporal, and twelve spiritual counsellors, three *chambres des enquêtes*, each with two presidents and twenty-three counsellors, and the *chambre des requêtes*, with two presidents, and fourteen counsellors. Criminal cases were tried in the *chambre de la Tournelle*, in which members of all the chambers sat in turn. The crown advocates (q. v.) belonged also to the parliaments, with above 500 lawyers, and a great number of subalterns. Some of the feudal principalities, even before their union with the crown, had similar tribunals; the county of Toulouse, for instance, had a parliament, Normandy her great feudal court (*scaccarium* or *echiquier*) at Rouen. After the union with the crown, parliaments were erected, by degrees, for the other provinces; at Toulouse, at Grenoble for Dauphiné, Bordeaux for Guienne, Dijon for Burgundy, Besançon for Franche Comte, Rouen, Aix for Provence, Pau for Bearn, Rennes for Brittany, Metz for the three bishoprics Metz, Toul, and Verdun, Douay for Flanders, and Nancy for Lorraine. The form of publication of the royal decrees consisted in sending them to the parliaments, which entered them in the registers, and transmitted them to the lower courts. This gave to these courts a peculiar political influence. They insisted that they had the right to make protestations to the king against decrees, and that thus they represented the estates of the realm. In early times, the court sometimes yielded. From the time of Louis XIV., however, the registering of the decree was generally obtained by the king's appearing personally in parliament, when no debate was permitted, and the registering was ordered (*lit de justice*, q. v.) Refractory parliaments were banished to Tours, Compiegne, Orleans. But the resistance of the parliaments could not always be thus overcome. The parliaments, whose members had bought their places for the sake of the dignity, showed great obstinacy, and it was sometimes necessary to yield to them. Hence Louis XV., towards the end of his reign, adopted a bolder and more fundamental measure: all the old parliaments were abolished in 1771, the sums for which the places had been bought were paid back, the new places filled by the king only, and the old members, in part, banished to small and remote towns, and, in part, imprisoned. For a long time no lawyer was willing to plead before the new courts; and when, at length, the administration of justice was recommenced, the king died, and Louis XVI. restored the old parliaments. They immediately renewed their opposition to the court, the ministers, and the superior clergy; refusing every thing, just and unjust, desired by the court. The archbishop of Sens abolished them again in 1788; but the courts established by him were acknowledged by no one. At length, the parliament declared that the assembly of the states-general alone was capable of granting what the government desired, and thus gave the signal to that revolution in which it was one of the first things overthrown. In the article *France*, division, *France before the Revolution*, we have spoken of the political influence of these bodies upon the whole organization of government. They assumed all characters, the judicial, legislative, and often executive.—We refer, for further information, to Meyer's *Esprit, Origine et Progrès des Institutions Judiciares des principaux Pays de l'Europe* (Hague, 1819.)

Parliament of Great Britain. A sketch of its constitutional power and organization is given in the article *Britain*. At present we shall only give some particulars respecting the forms of doing business in parliament. The method of making laws is much the same in both houses. In each house the act of the majority binds the whole; and this majority is declared by votes openly given; not privately, or by ballot. To bring a bill into the house of commons, if the relief sought by it is of a private nature, it is first necessary to prefer a petition, which must be presented by a member, and usually sets forth the grievance desired to be remedied. This petition (when founded on facts that may be disputed) is referred to a committee of members, who examine the matter alleged, and report to the house; and then (or otherwise upon the mere petition) leave is given to bring in the bill. In public matters, the bill is brought in upon motion made to the house, without any petition. (In the house of lords, if the bill begins there, it is, when of a private nature, referred to two of the judges, to examine and report the state of the facts alleged, to see that all necessary parties consent, and to settle all points of technical propriety.) This is read a first time, and, after a convenient interval, a second time; and, after each reading, the speaker puts the question whether it shall proceed any further. The introduction of the bill may be originally opposed, as the bill itself may, at either of the readings; and if the opposition succeeds, the bill must be dropped for that session; as it must, also, if opposed with success in any of the subsequent stages. After the second reading, it is committed, that is, referred to a committee, which is either selected by the house in matters of small importance, or else, if the bill is a matter of great or national consequence, the house resolves itself into a committee of the whole house. A committee of the whole house is composed of every member; and, to form it, the speaker quits the chair (another member being appointed chairman), and may sit and debate as a private member. In these committees, the bill is debated clause by clause, amendments made, the blanks filled up, and sometimes the bill entirely new-modelled. After it has gone through the committee, the chairman reports it to the house, with such amendments as the committee have made; and then the house re-consider the whole bill again, and the question is repeatedly put upon every clause and amendment. When the house have agreed or disagreed to the amendments of the committee, and sometimes added new amendments of their own, the bill is then ordered to be engrossed, or written in a strong, gross hand, on one or more long rolls of parchment sewed together. When this is finished, it is read a third time, and amendments are sometimes then made to it; and if a new clause be added, it is done by tacking a separate piece of parchment on the bill, which is called a *rider*. The speaker then again opens the contents, and, holding it up in his hands, puts the question whether the bill shall pass. If this be agreed to, the title is then settled. After this, one of the members is directed to carry it to the lords, and desire their concurrence, who, attended by several more, carries it to the bar of the house of peers, and there delivers it to their speaker, who comes down from his woolsack to receive it. It there passes through the same forms as in the other house (except engrossing, which is already done), and if rejected, no more notice is taken, but it passes *sub silentio*, to prevent unbecoming altercations. But if it be agreed to, the lords send a message by two masters in chancery (or, sometimes, in matters of high importance, by two of the judges,) that they have agreed to the same; and the bill remains with the lords, if they have made no amendment to it. But if any amendments are made, such amendments are sent down with the bill to receive the concurrence of the commons. If the commons disagree to the amendments, a conference usually follows between members deputed from each house, who, for the most part, settle and adjust the difference; but if both houses remain inflexible, the bill is dropped. If the commons agree to the amendments, the bill is sent back to the lords by one of the members, with a message to acquaint them therewith. The same forms are observed, *mutatis mutandis*, when the bill begins in the house of lords. But when an act of grace or pardon is passed, it is first signed by his majesty, and then read once only in each of the houses, without any new engrossing or amendment. And when both houses have done with any bill, it always is deposited in the house of peers, to wait the royal assent, except in the case of a money bill, which, after receiving the concurrence of the lords, is sent back to the house of commons. The answer to the question put by the speaker, or the chairman, in the house of commons, is *Aye*, or *No*; and, in the house of peers, *Content*, or *Not Content*.

The royal assent to bills may be given, 1. in person. When the king is to pass bills in person, he appears on his throne in the house of peers, in his royal robes, with the crown on his head, and attended by his great officers of state and heralds, and sends for the house of commons to the house of peers; the speaker carries up the money bill, or bills, in his hand; and, in delivering them, he addresses his majesty in a solemn speech, in which he seldom fails to extol the generosity and loyalty of the commons, and to tell his majesty how necessary it is to be frugal of the public money. The titles of all bills that have passed both houses are read; and the king's answer is declared by the clerk of the parliament in Norman-French. If the king consents to a public bill, the clerk usually declares, *Le roy le veut* (The king wills it so to be); if to a private bill, *Soit fait* *comme il est désiré* (Be it as it is desired). If the king refuses his assent, it is in the gentle language of *Le roy s'avisera* (The king will advise upon it.) When a money bill is passed, it is carried up and presented to the king by the speaker of the house of commons, and the royal assent is thus expressed, *Le roy remercie ses loyaux sujets, accepte leur bénévolence, et aussi le veut* (The king thanks his loyal subjects, accepts their benevolence, and wills it so to be.) In case of an act of grace, which originally proceeds from the crown, and has the royal assent in the first stage of it, the clerk of the parliament thus pronounces the gratitude of the subject; *Les prélats, seigneurs, et communs, en ce present parlement assemblées, au nom de tous vos autres sujets, remercient très humblement votre majesté, et prient à Dieu vous donner en santé bonne vie et longue* (The prelates, lords, and commons, in this present parliament assembled, in the name of all your other subjects, most humbly thank your majesty, and pray to God to grant you in health a long and happy life). 2. The king may give his assent by letters patent under his great seal signed with his hand, and notified in his absence, to both houses assembled together in the upper house, by commissioners consisting of certain peers, named in the letters. And, when the bill has received the royal assent in either of these ways, it is then, and not before, a statute or act of parliament. This statute or act is placed among the records of the kingdom; there needing no formal promulgation to give it the force of a law, as was necessary by the civil law with regard to the emperor's edicts; because every man in England is, in judgment of law, party to the making of an act of parliament, being present thereat by his representatives. However, copies thereof are usually printed at the king's press, for the information of the whole land. An act of parliament cannot be altered, amended, dispensed with, suspended, or repealed, but in the same forms, and by the same authority of parliament; for it is a maxim in law, that it requires the same strength to dissolve as to create an obligation. The forms of doing business in the congress of the United States of America are substantially the same as in the British parliament.

PARMA; a duchy in Upper Italy, bounded by the Milanese on the north and west, by the Modenese on the east, and the Apennines on the south, and composed of the duchies of Parma, Piacenza, and Guastalla; 2200 square miles; 419,201 inhabitants. It is hilly, but fertile, and highly cultivated, yielding corn, wine (*vino santo*), silk, oil, hemp. The breeding of sheep is also much attended to. The principal manufacture is that of silk. The capital, Parma, on a river of the same name, is a fortified place, with 35,000 inhabitants. The streets are for the most part handsome, and the houses well built. The churches contain the masterpieces of Correggio, Lanfranco, and Mazzuoli (surnamed *Il Parmegiano*,) who were born here. The cathedral contains the celebrated fresco of Correggio, the Assumption of the Virgin Mary, which is much injured, and the church of the Holy Sepulchre, the *Madonna della Scudella* of the same master. The church of the *Madonna della Steccata* is worth visiting for the monuments of the Farnese, and the capuchin monastery for its paintings. Among the other buildings and institutions of the city, are the ducal palace, with a gallery of paintings and works of art, the finest pieces of which, however, were carried to Naples in 1734; an excellent library; an academy of belles-lettres and the fine arts, founded in 1765; the university, with 400 students; the opera house, built in 1618, which is the largest in Europe; the theatre, &c. The Bodoni press, to which belong MSS. in 200 languages, is one of the first in Europe.

Parma, with Piacenza, anciently belonged to Cisalpine Gaul, and, at a later period, to the confederacy of Lombard cities. The houses of Este and Visconti were in possession of Parma for some time. Louis XII. conquered both cities; and, after the dissolution of the league of Cambray (1508), pope Julius II. reduced them. Pope Paul III., of the house of Farnese (q. v.), raised Parma, with Piacenza, to a duchy, and conferred it on his natural son. On the extinction of the male Farnese line, don Carlos, son of Philip V. of Spain and Elizabeth Farnese, received the duchies of Parma and Piacenza, which, on his accession to the throne of the Two Sicilies, were ceded to the emperor by way of indemnification. By the peace of Aix-la-Chapelle (1748), Austria ceded Parma, Piacenza, and Guastalla to the Spanish Infant don Philip, whose son Ferdinand preserved his estates; but, on his death in 1802, France took possession of them, his son being created king of Etruria. In 1805, Parma, Piacenza, and Guastalla were incorporated with the French empire, and, by the peace of Paris (1814) and the decree of the congress of Vienna (1815), were transferred to Maria Louisa, empress of France and archduchess of Austria. Spain protested against this arrangement, and claimed them for Maria Louisa, widow of the king of Etruria (duchess of Lucca), whose husband had relinquished them only on condition of receiving Etruria. In 1817, a new convention was therefore concluded, by which it was stipulated, that, on the death of the ex-empress, they should pass (with the exception of some districts on the left bank of the Po, and the right of maintaining a garrison in Piacenza, reserved to Austria) to the duchess of Lucca and her male posterity. Lucca was then to pass to the grand duke of Tuscany, who, in return, was to cede his estates in Bohemia to the duke of Reichstadt, son of Napoleon.

PARMEGIANO, or PARMEGIANINO. See *Mazzola*.

PARMENIDES; a Greek philosopher of Elea, who developed more fully the speculative views of Xenophanes, his friend and instructer, and is therefore the most celebrated of the Eleatic school. He flourished about the 79th Olympiad, and seems to have gone to Athens in the 80th, or B. C. 470. Here Socrates, then a young man, probably saw him. He was highly esteemed by the ancients, not merely as a speculative philosopher, but as the wise lawgiver of Elea. He accurately distinguished between the knowledge gained from reason and that obtained from the senses. The pure existence from the notion of which he proceeded, is known only by reason; it is one, unchangeable and eternal, limited only by itself, and consequently filling space. Change and motion, on the contrary, are only appearances. He also proposed a theory on sensual phenomena. In this theory, he adopted heat and light, or fire, and cold and darkness, or the earth, as opposite principles. Fragments of his philosophical poem on nature are found in Stephens, also collected with a translation by Fulleborn (Zullichau, 1795), and in Brandis's *Commentationes Eleaticæ*, p. I. (Altona, 1813).

PARMESAN CHEESE. See *Lodi*.

PARNASSUS (now *Liakura*); a mountain in the ancient Phocis (now *Roumili*), at the foot of which lay Delphi (q. v.), with the fountain of Castalia, in whose crystal waters the priestess and those who consulted her were required to purify themselves. Parnassus was sacred to Apollo and the Muses. It has two peaks, of which the southern was called *Hyampea*, the north-western *Tithorea*. The highest summit was called *Lyconeus*; on it the Bacchantes celebrated their orgies.

PARNELL, THOMAS, an English poet, was born in Dublin, in 1679. He was educated at Trinity college, and, taking orders in 1705, was presented to the archdeaconry of Clogher. He was connected with Addison, Congreve, Steele, and other whigs in power; but, towards the latter part of queen Anne's reign, when the tories became triumphant, he deserted his former friends, and linked himself with Swift, Pope, Gay, and Arbuthnot. He afforded Pope some assistance in his translation of Homer, and wrote the Life prefixed to it; but, being a very bad prose writer, Pope had a great deal of trouble in correcting it. He contributed to the Origin of the Sciences, and wrote the Life of Zoilus, as a satire on Dennis and Theobald, with whom the Scriblerus club had long been at variance. By Swift's recommendation, he obtained a prebend and the valuable living of Finglass, but finally contracted habits of intemperance, which shortened his life. He died in 1717. A collection of his poems was published by Pope after his death. They are pleasing, and possess fancy, ease, sprightliness, and melody of versification; while their sentiments are elegant, and morality pure. Another posthumous volume was published at Dublin, in 1758.

PARNY, CHEVALIER EVARIST DE, called the *French Tibullus*, was born, in the Isle of France, in 1742, went to France in 1753, studied at Paris and Rennes, was for some time seized with a religious zeal, and wished to become a Trappist, but finally entered the military service. He then returned to the Isle of France, where a disappointed passion for a young girl, known to us under the name of *Eléonore*, made him a poet. Grace and tenderness of sentiment, depth of feeling, richness of imagination, united with harmony, and ease of versification, were the characteristics of his elegies, which placed him in the first rank of classical French poets. His *Epître aux Insurgents de Boston* (Epistle to the Boston Rebels), published in 1777, deprived him of any hopes of ministerial favour. Besides his elegies, he also wrote *La Guerre des Dieux*, *Le Portefeuille volé*, and *Les Rosecroix*. The first of these poems—an attempt to throw ridicule on Christianity—was an imitation of Voltaire's *Pucelle*. In the second work above mentioned, *Les Déguisements de Venus* is distinguished for grace and freshness of description. Several other works of Parny, which it is unnecessary to mention, were violations of the rules of decency and good morals, and he was in consequence excluded from the institute on its first organization. In 1808, however, he was admitted into that body. His death took place in December, 1814.

PARODY. The Greeks gave this name to humorous poems, or to parts of them, in which whole passages or single expressions were taken from serious compositions. Athenæus has preserved a poem of this kind by Matron, and calls Hipponax the inventor; but, according to Pristotle, Hegemon of Thasus invented them. Aristophanes is full of such parodies. By *parody*, at present, is generally meant a composition in which a serious composition has been transformed by changing its subject into another, either serious or comic, most commonly the latter; hence a *parody*, in its narrower sense, is the same as a *travesty*. In a still narrower sense, *parody* means a poem in which merely the chief personages and ideas are changed, but the subordinate parts and the whole tone are preserved, as in the Battle of the Frogs and Mice. Contrast is the chief instrument of parody, and as mere contrast, by exciting surprise, often produces, for a time, the effect of wit, poor parodies often please for a moment by boldness in applying the gravest expressions to the most comic subjects, or the reverse.

PAROLE; a term signifying any thing done verbally, or by word of mouth, in contradistinction to what is written; thus an agreement may be by parole. Evidence, also, may be divided into *parole* evidence and *written* evidence. See *Evidence*.

In military affairs, a promise given by a prisoner of war, when he has leave to depart from custody, that he will return at the time appointed unless discharged. It is also used for a word given out every day in orders by a commanding officer, in a camp or garrison, by which friends may be distinguished from enemies.

PARONOMASIA; a rhetorical figure by which different ideas are expressed by words of similar sound or the same extraction, in order to make the difference more striking; for instance:—

Not *friends*, but *fiends*, are here.

PAROQUET. See *Parrot*.

PAROS; an island of the Grecian Archipelago, in the Central Cyclades, to the west of Naxos, with a population of 2000 Greeks. The island is mountainous, but fertile and well cultivated; square miles 100. Paros was celebrated, in ancient times, for its marble, which was remarkable for its whiteness and firmness, and withstood the action of the weather better than any other sort. (See *Marble*.) The famous Parian chronicle was taken hence in 1627. (See *Arundelian Marbles*.) Many remains of ancient buildings are still found in the island. Near it lies the island of *Antiparos*, with 500 inhabitants. It was the birth-place of Phidias and Praxiteles, and contains a celebrated grotto or cave, full of fine stalactites.

PAROXYSM OF A FEVER. See *Fever*.

PARR, CATHARINE. See *Catharine Parr*.

PARR, SAMUEL, a learned divine and eminent critic, was the son of an apothecary of Harrow, in Middlesex, where he was born in 1747. At the age of six, he was admitted into the celebrated school of his native place, which he headed in his fourteenth year. He entered Emmanuel college, Cambridge; but, unable to support the expense, accepted the situation of usher at Harrow. In 1769, he entered into deacon's orders, and, in 1771, was created A.M. at Cambridge, by royal mandate, for the purpose of qualifying him to succeed doctor Sumner, in the mastership of Harrow school; but, not succeeding, he opened a school at Stanmore, and in 1776, became master of the grammar school at Colchester, whence, in 1778, he removed to take charge of that of Norwich. In 1783, he obtained the perpetual curacy of Hatton, in Warwickshire, where he afterwards resided, and was presented by bishop Lowth to a prebend in the cathedral of St Paul. In 1802, Sir Francis Burdett presented him to the valuable living of Graffham, in the county of Huntingdon. Doctor Parr commenced his career as an author in 1760, by the publication of Two Sermons on Education; and, in the following year, printed a Discourse on the late Fast, which, in consequence of its allusion to the contest with America, excited great attention. In 1787, he assisted his friend Henry Homer in a new edition of the learned Scotsman William Bellenden (Bellendenus). This republication he inscribed to Messers Fox and Burke, and lord North, the character of whose oratory he drew with uncommon elegance, force, and felicity. Making use of the same opportunity to assail that of their political opponents, he put an end to all hopes of preferment from government, on which account a subscription was made by the whig club, which secured him an annuity of £300 per annum. In 1789, he republished the Tracts by Warburton and a Warburtonian, to which he prefixed some severe strictures on bishop Hurd. In 1790, he engaged in the controversy on the real authorship of White's Bampton Lectures, from which it appeared that his own share in them was by no means inconsiderable. In 1791, his residence was in danger of destruction from the Birmingham rioters, in consequence of his intimacy with doctor Priestley. On this occasion, he published a tract, entitled a Letter from Irenopolis to the Inhabitants of Eleutheropolis. On Easter-Tuesday, 1800, he preached his celebrated Spital sermon, in which he attacked the social doctrine of Godwin's Political Justice. This discourse he soon after published, with notes. On the death of Mr Fox appeared his Characters of the late Right Honourable Charles James Fox, selected, and, in part, written, by Philopatris Varvicensis. In 1819, he reprinted Speeches by Roger Long and John Taylor, of Cambridge, with a critical Essay, and Memoirs of the Authors, and composed a pamphlet, which appeared after his death, defending bishop Halifax from the charge of having become a convert to the church of Rome in his last sickness. His death took place at Hatton, March 26, 1825, in his seventy-ninth year. In curious and elegant classical knowledge, he seems to have been at the head of the English scholars of his day. His prodigious memory and extent of research rendered him very powerful in conversation. His Works, with a Memoir, by Johnson, appeared in 8 vols., 8vo (London, 1828); and Memoirs of Doctor Parr, &c., by Field (2 vols., 8vo, 1828).

PARRAKEET, or PAROQUET. See *Parrot*.

PARRHASIUS, a Greek painter, born at Ephesus, flourished about 420 B. C. He was a contemporary and rival of Zeuxis. According to Pliny, he was the first who introduced proportion into painting, lively expression and grace into the countenance and attitude, and he excelled all other painters in design. Several of his pictures are mentioned by ancient authors, but none of them has been preserved. His success rendered him arrogant; according to Athenæus, he clothed himself in purple, wore a gold wreath on his head, and pretended to be descended from Apollo, one of whose surnames was *Parrhasius*. See *Painting*.

PARROT (*psittacus*). This splendid genus includes about 170 species. The luxuriant tracts of the torrid zone seem to be the favourite residence of these noisy, numerous, and richly-plumaged tribes. They are not, however, as was supposed by Buffon, confined to that zone, as later discoveries have shown that they are found in this continent as far south as the straits of Magellan, and on the shores of Van Diemen's Land; and one species in the United States of America is resident as far north as 42°. Bill hooked; upper mandible movable, and, for the most part, covered with a case; nostrils rounded, basal; tongue, in most of the species, fleshy, obtuse, and entire; feet formed for climbing. They assist themselves in climbing with the bill, associate in pairs or flocks, feed on the seeds and fruits of various plants, often attain to a great age, and, by means of their obtuse tongue, and the conformation of their larynx, may be taught to imitate the human speech. They are of a great variety of sizes, from that of the domestic fowl to that of a sparrow. The macaw has been described in a separate article. The pavouane parrot (*P. Guianensis*) is found in the Antilles and Guiana, where it assembles in large flocks, and does great injury to the coffee plantations. The ring paroquet (*P. Alexandri*), which is remarkable for its docility and imitative powers, seems to have been the only species known to the earlier Greeks and Romans, having been brought from Ceylon after the expedition of Alexander. They afterwards obtained other species from Africa. Common gray parrot (*P. erithacus*), about the size of a small pigeon, is remarkable for its loquacity, docility, and distinctness of articulation. It is common in many parts of Africa. Individuals of this species are known to have lived about 100 years. The common green parrot (*P. Amazonius*, Shaw), of which the varieties are very numerous, is a native of South America. The Guinea parrot (*P. pullarius*) is a highly beautiful species, about five inches in length, and is found in the East Indies and Africa. They easily imitate other birds, but articulate with difficulty. The only species found native in the United States is the Carolina or Illinois parrot (*P. Carolinensis*), which is resident from the gulf of Mexico to the neighbourhood of lake Michigan, and on the east of the Alleghanies to Maryland, and occasionally strays into New York. Their favourite food is the seeds of the cockle-bur, which grows in great abundance along the shores of the Mississippi and the Ohio. They are seen in large flocks, screaming round the salt licks, being, like the pigeons, fond of the salt water. They are very sociable in their dispositions, extremely fond of each other, and showing the greatest grief for the loss of their companions. The plumage is very beautiful, the general colour being a bright-yellowish, silky green, with light-blue reflections. The tail is long and cuneiform. These birds are about thirteen inches long, and twenty-one in extent.

PARSEES. See *Guebers*.

PARSLEY (*apium petroselinum*); a well-known garden vegetable, used for communicating an aromatic and agreeable flavour to soups and other dishes. The root is elongated and whitish; the stem upright, three or four feet high, striated and branching; the leaves doubly pinnate, with the leaflets of the inferior part of the stem oval, wedge-shaped and incised, and the superior ones linear. the flowers are small, yellowish white. It belongs to the natural family *umbelliferæ*, and is supposed to have been brought originally from Sardinia, though now common throughout the south of Europe. All domestic quadrupeds are fond of the leaves, but they are a dangerous poison to poultry and other birds.

Parsley is sown from March to August, and the leaves may be cut several times during the summer, provided that care is taken to water the plants in times of drought. As the root is biennial, the flowers and seeds do not appear until the second season; and, if cut before flowering, the duration of the plant is frequently prolonged another season.

Celery is a second species of *apium*, and, in its wild state, is a small, acrid, and noxious plant, but, from cultivation, has become one of our most valuable salads.

PARSNEP (*pastinaca sativa*); a well-known culinary vegetable, a native of the south of Europe. The root is biennial and fleshy; the stem herbaceous, upright, striated, rigid, and branching; the leaves pinnate, alternate, and sheathing at the base, composed of oval, slightly lobed, and incised leaflets. The flowers are small, yellow, and are disposed in umbels, as is usual with the *umbelliferæ*. In the wild plant, the leaves and stem are hairy; but, when cultivated, they become smooth, and the root is larger and more succulent.

Parsneps are sweetish, and slightly aromatic to the taste. Besides their use for the table, they are often cultivated on an extensive scale as fodder for cattle. The milk of cows is improved in quality, and the quantity is increased, by their use, and, besides, yields butter of a fine saffron yellow, and excellent flavour. Indeed, all domestic quadrupeds are extremely fond of them. As an article of food for man, they are agreeable to most palates, and are considered wholesome, and highly nutritious. They may remain in the ground all winter, as they are not liable to injury from frosts, and may be taken up as required. They are sown in the autumn, or more frequently in the spring, and the roots are in perfection about the end of September.

From the *pastinaca opoponax*, a native of the countries about the Mediterranean, is obtained a gum-resin, which is famous in the East for curing all kinds of maladies.

PARSONS, Theophilus, a distinguished chief-justice of Massachusetts, was born in February, 1750, in Byefield, Massachusetts. His father was minister of that parish. His youth was assiduously devoted to the study of the Latin and Greek languages, logic, metaphysics, and the mathematical sciences. He studied law in Falmouth, now Portland, and kept for some time the grammar school in that town. He practised law there a few years; but, in consequence of the destruction of the town by the British, he retired to the house of his father, in Newbury. In about a year from this time, he opened his office in Newburyport. Never was fame more early or more just than that of Parsons as a lawyer. His professional services were generally sought for, not merely in his native county, but in the neighbouring state of New Hampshire and in Boston. After thirty-five years' extensive practice, he succeeded chief-justice Dana in the supreme judicial court of Massachusetts in 1806. The regularity of trials, and the promptness and correctness of decisions throughout the commonwealth, soon attested the beneficial effects of his labours. The first six volumes of the reports of the court in which he presided are a monument of his accurate juridical reasonings, and his deep and extensive knowledge of the common law, and the constitutions and statutes, of his country.—As regards his political character, although unwilling to take so great a share in public councils as his townsmen and the people of his county desired, yet, on great occasions, he gave his time and talents to the state. He died at Boston, Oct. 30, 1813.

PARTHENON. See *Athens*.

PARTHENOPE. See *Naples*.

PARTHIA. By Parthia, in the widest sense, we understand the Parthian empire, lying between the Euphrates, the Oxus, the Caspian, and Arabian seas. In the narrowest sense, Parthia (*Parthyene*) is the small country formerly inhabited by the Parthians, bounded by Hyrcania, Aria, Carmania, and Media, and encircled by mountains. It was situated in the northwestern part of the modern Chorasan, where Kurti and Thus now lie. In a middle sense, Parthia included the northern provinces of Persia, Hyrcania Felix (now *Masenderan*, *Jerjan*, and *Corcan*), the small Parthyene itself, celebrated for its breed of horses, Aria (a part of Chorasan), Margiana (now *Forg* and *Marushak* in East Chorasan), Bactriana (or the southern part of Bucharia), the regions about the Paropamisus (the district around Candahar), Drangiana (*Segistan*), Arachosia and Sogdiana (the northern division of Great Bucharia). The Parthians (fugitives) were known in the earliest times as a nation of barbarians. They were of Scythian origin. Polygamy was common among them. They fought only on horseback, were celebrated for their skill in archery, and were particularly formidable in flight. They were subject successively to the Persians, Macedonians, and Syrians. Under the latter they remained till the time of Antiochus II. At that period, Arsaces (Aschak) took up arms, expelled the Syrians, and extended his conquests over the neighbouring countries. His successors continued his career of victory. This was the origin of the Parthian empire, governed by the Arsacidæ (Aschcanians or Aschakians), from B. C. 156. Ctesiphon, the capital, on the eastern bank of the Tigris, was built by Vardanus. They carried on war with the Romans with various fortune, but the Romans never gained any permanent advantage over them. Crassus was slain in a battle against them, B. C. 53, in which he was defeated with great loss. Trajan, indeed, conquered a part of Parthia; but this conquest was lost partly by himself and partly by Adrian. In the year A. D. 214, Artaxerxes, a Persian, son of Sassan, excited a rebellion, drove the Arsacidæ from the throne, and, in 229, subjected all Central Asia, and founded the line of the Sassanides. See *Persia*.

PARTICIPLE; that part of a verb which has the nature of the adjective, with this addition,—that it expresses also the relations of time, the present, past, &c. This double nature gave the participle its name, *participating* as it does of the characters of two parts of speech. Many languages have active and passive participles, past, present, and future. The beauty of a language, its force and expressiveness, depend greatly upon the perfection of its participles. The modern European languages are very deficient in this respect, compared with the two classical languages.

PARTICLES (*particulæ*); such parts of speech as are incapable of any inflection, as, for instance, the preposition, conjunction, &c. These words are generally short, consisting mostly of original sounds, and the name *particles* has been given to them from this circumstance; but, as the external dimension of a word is a very unphilosophical and insufficient ground of classification, many grammarians have dropped this name, and divided all parts of speech into declinable and indeclinable.

PARTIDAS, Las. See *Alphonso X.*, and *Louisiana, Code of*.

PARTITION is a dividing of lands descended by the common law, or custom, among coheirs or parceners, where there are two at the least.

PARTNERSHIP. A partnership is an agreement between two or more to share in the profit and loss of the use and application of their capital, labour, and skill, in some lawful business, whether one supplies capital, and another skill and labour, or each contributes both labour and capital. The benefits of a union of the means and advantages of different persons for the conduct of a branch of business, in many instances, are too obvious and common to need illustration. A partnership is not constituted merely by an interest of different parties in the same thing, but it depends on a participation of profits and joint liability to loss. And yet there are some exceptions to this rule, for it has been held that seamen shipping on shares in a fishing voyage are not copartners with the owners. And so, where a certain share or commission is allowed to a clerk, or agent, depending on the success of the business or amount of profits, in addition to his other compensation, it has been held, in many cases, not to make him a copartner. It is difficult to point out the criterion by which cases of this description are distinguished from those of copartnership; and some of them look more like an exception of cases which strictly come within the definition of copartnership. A question has been made whether joint owners of a ship are copartners, and the general doctrine is that they are not so; and yet it is generally held that each one is liable for the whole amount of repairs and expenditures in the navigation of the ship; but still the ownership is not joint, for, in case of the decease of one, the property in the whole ship does not survive to the others, as would be the case if it were partnership property, but the property is held in common, each part owner having a distinct title to his share; and one part owner cannot, merely as such, convey a title to the whole ship, or to any share except his own. As to the share of each partner in the profits, or his liability for losses, if there is no agreement on this subject, all the partners stand upon an equal footing. As to the objects of copartnerships, they are not confined to commerce, though most frequent in that branch of industry, but may embrace manufacturing, the carrying on of any mechanic art, agriculture, the practice of law, or of medicine, and, in short, almost every lawful branch of business.

Copartnership is more usually formed by a written agreement; and by some codes, and in regard to certain copartnerships, formal stipulations are required by law in order to constitute a copartnership. This is not a general rule, however, for, in many branches of business, parties may agree orally on a participation in profit and loss. These associations are divided into different classes, distinguished by their objects, and the extent of the liability of each partner. The Roman law allowed of general copartnerships, extending the community of property and joint profit and loss not only to the business pursued, but also to all acquisitions by either party, whether by legacy, inheritance, gift, or as the fruits of industry. By that law, and so by the laws of France, Spain, Louisiana, and other codes derived from the Roman law, a man and his wife may be copartners; and in making the marriage contract, the kind and extent of copartnership is agreed upon, the form of the stipulation for this purpose being particularly pointed out by the French code. It was between the parties to the marriage contract that the general copartnerships above mentioned were most frequently formed. In this respect, however, the Roman law, and those codes derived principally from it, leave the parties at liberty to agree upon a universal copartnership or a limited one, or a separate property.

Copartnerships are usually confined to the prosecution of a particular branch of business, and it very often happens that each copartner is concerned in other branches. The term *general copartnership* is also applied to one formed for trade generally, or business generally, without limitations; but where the joint interest extends only to a particular concern, as, for instance, the freighting of a ship, it is called a *special copartnership*. And so a partnership is called *special* when the parties enter into stipulations modifying and restraining the powers and rights of the members, instead of leaving them to the operation of the laws generally applicable to such associations; and this is the usual meaning of *special copartnership*. Another description is that of *limited* copartnerships, in which one or more partners put in a certain amount of capital, which is liable for the contracts of the firm; but beyond this the party or parties are not liable. This sort of partnership is particularly provided for in the French code, and is not unfrequent in France. It is a very useful provision of the law that allows of such associations, for it enables persons of fortune, and retired from business, to put a part of their capital at risk in trade, without risking their whole property; and it accordingly operates very favourably upon the enterprise of the community; for a young man who has only his talents and industry to put into a concern, can thus more easily obtain the capital necessary to give his activity and enterprise scope, and every community ought to open all practicable channels for the intellectual and physical exertions of its members. The condition of such a limited copartnership is, that the name of the person whose liability is thus limited must be used in the firm, and particular provisions are made as to paying in the amount of capital stipulated; and another suitable provision in such case is the provision for some registry by which it may appear to those who wish to make the inquiry what amount such partner pays in. Some partnerships are *secret;* that is, some one agrees, upon certain terms, to share profits with the ostensible partners, without any notice to the public of his being a member of the firm. Each partner has a joint interest in the whole personal property, and, unless the articles stipulate otherwise, may transfer it. Each partner may also bind the whole firm by his contract made in the course of the business of the firm, unless it be otherwise agreed between them. And even when it is otherwise agreed, still, if a party with whom a partner contracts has a legal right, from the manner in which the joint affairs are managed, to presume that a partner is authorized to contract for and bind his copartners in regard to the subject of any contract, the firm will be bound by such contract. But if the party contracted with has notice that, by the articles of copartnership, a partner has not authority to make a contract, the company will not be bound by it. So if a partner contracts, in the partnership name, in a matter which the party contracted with knows is not within the business of the firm,—as if he makes a negotiable note in the name of the firm for his own separate debt,—the contract will not bind the firm to the party thus contracted with; but still, if this contract, being transferable in its nature, and holding out on the face of it the responsibility of the whole firm, is negotiated to those who have no notice that the paper was made for the private accommodation of the partner who signed the partnership name, the company will be bound in respect to such assignee; that is, the firm having given notice to the world that they are copartners in a certain branch of business, every one has a right to presume that all acts done by each of them in regard to it are authorized by the terms of their contract or the circumstances of the case, unless he has notice to the contrary. But certain acts are not authorized by the general powers of copartners, and those no one partner can be presumed to have power to do; as for instance, one partner is not, merely as such, authorized to make a deed in the name of the other, or to act as his attorney; and he cannot, accordingly, convey land belonging to the members of the company; for, though it may have been acquired and paid for with the property of the firm, yet when acquired it belongs to the members in common, if the title be in them all, and each member can himself convey only his share; and in order to the conveyance of that of another, he must be specially empowered. But a partner may release a debt due to the firm, if it be done fairly, and without collusion between him and the debtor. It has been held, however, that one partner cannot by deed submit a question to arbitration.

A partnership may be dissolved by its own limitation, the death, bankruptcy, or insanity of a member, or by the breaking out of a war between the countries to which the members belong. A question is also made whether a member may dissolve the copartnership voluntarily before the time for which it was formed expires; and the opinion seems to be that he may do so by giving sufficient notice to this effect; and this seems to be necessarily incident to new associations. For though he would, in such case, be answerable to his copartners for the breach of his agreement, yet it would be exceedingly inconvenient if a partner were irrevocably bound to give his copartners the right of his credit, and of disposing of his property after all his confidence in them had ceased. In case of mismanagement by any partner having the charge of the partnership effects, so that the other partners are liable to be materially injured, they may make application to a court of chancery to appoint a receiver to take charge of the concerns of the company, and wind up its affairs, in case the partnership has already been dissolved, or in case there appears to be sufficient reason to dissolve it. But where there is no ground for such application to a court of chancery, and the company is dissolved by the death of one partner, the joint property will survive to the other partner, who may dispose of it, and collect and pay the debts of the concern, and will be liable to account to the personal representatives of the deceased partner for his proportion of the surplus property. In case of the decease of a partner, his personal representatives do not become copartners with the surviving partners, but the affairs of the concern must be settled with reference to the time of the death of the deceased partner.

PASA, or FESA (anciently *Pasargada*); a town in Persia, in Farsistan; sixty-eight miles south-east of Schiras, 235 south-south-east of Ispahan; lon. 53° 40′ E.; lat. 29° 10′ N. This was formerly the burial-place of the Persian monarchs, and a royal city.

PASCAGOULA; a river of Mississippi, which runs south into the gulf of Mexico, thirty-eight miles west of Mobile bay; lon. 88° 30′ W. It is navigable for vessels drawing six feet of water about fifty miles. Length about 300 miles.

PASCAL, BLAISE, born at Clermont, in Auvergne, in 1623, was the only son of the president of the *cour des aides*, who educated him with great care, and instructed him himself. In early youth, he gave proofs of extraordinary talents, and showed a decided inclination for geometry. His hours of relaxation were employed in the study of mathematics. His father surprised him engaged in studying Euclid, which he understood without any assistance; and, in his sixteenth year, the young Pascal wrote a treatise on conic sections, displaying great acuteness, but which, notwithstanding the entreaties of his friends, he would not consent to publish. His studies in the languages, logic, physics, and philosophy, were pursued with such assiduity, that his health was irrecoverably gone in his eighteenth year. In the course of the next year, he invented the celebrated calculating machine, the mechanism of which it cost him much pains to render intelligible to the workmen, at a time when he was hardly free from suffering for a day. In his twenty-third year, he made several discoveries concerning the Torricellian vacuum. Before he was twenty-four years old, the reading of some religious works had brought him to the conviction that a Christian must love God only: he therefore laid aside all profane studies, and became more and more deeply rooted in his ascetic notions, which, however, had been familiar to his childhood. Pascal's piety produced a great effect on his whole family. His father became his pupil, and his sister a nun in the Port Royal. Pascal, although constantly sick, continued to practise his penances with additional rigour. By the direction of his physician, he went into society; but his sister soon induced him to renounce all intercourse with the world, and to give up all superfluities, even at the expense of his health. In this manner he lived from his thirtieth year till his death. After spending some time in a monastery, he retired to an estate in the country, denied himself every indulgence, made his own bed, ate in the kitchen, and allowed himself to be served only when it was indispensably necessary. He spent his time in prayer, and in reading the Scriptures (which he thus learned by heart), and commentaries on them. His disease, meanwhile, became aggravated, and he died in 1662, at the age of thirty-nine. Pascal had a powerful mind. He had conceived a work on the Christian religion, the object of which was to show its excellence, from a consideration of human nature as well as on historical grounds. The fragments, which were written down during the last four years of his life, and published under the title of *Pensées sur la Religion* (Amsterdam, 1667), show the hand of a master. His *Provinciales, ou Lettres écrites par Louis de Montalte à un Provincial de ses Amis*, is a most bitter satire upon the lax morality of the Jesuits, whose influence was more affected by it than by the most violent attacks of their declared enemies. These letters are esteemed a model of the didactic epistolary style in French literature. Pascal's *Œuvres* appeared at the Hague, in 1779, in 5 vols. Raimond's *Eloge de Pascal* (1816) contains an account of his life.

PASCATAQUA. See *Piscataqua*.

PASIGRAPHY (from πᾶσα, universal, *γραφη*, writing). A universal written or spoken language, that is, a language easily understood by all nations, has never yet been formed. Leibnits seems to have first conceived the idea; at least, he laboured a good deal in attempting to execute it. He was followed by Wilkins in England, (1668), and in Germany by Berger, Plan of a Universal Written and Spoken Language (in German, Berlin, 1779); Wolke, Means of rendering a Universal Language practicable (in German, 1797); Sicard, the celebrated instructer of the deaf and dumb (in 1798); Nather (in 1805); Bürja, *Pasilalie* (1808); J. M. Schmidt, of Dillingen, Attempts at Pasigraphy (in German, Vienna, (1815); and Stethy, *Lingua universalis* (Vienna, 1825). The academy of sciences at Copenhagen, in 1811, offered a prize for the best plan of such a language, and its accomplishment. "The idea of a universal language," says Wagner, in his Philosophy of Education, "is founded upon the fact, that the essence of every language consists in its internal organization, for which a common expression must be possible, since this internal organization of a language can be only the expression of the various relations of ideas, and these relations, again, only the expression of the real relations of things. If, now, a general representation can be found for these relations, a universal grammar is obtained; and, if this can be communicated in common characters, intelligible by every one, we have a complete pasigraphy."—See Vater's *Pasigraphy and Anti-Pasigraphy* (in German, Weissenfels, 1795); Niethammer, *Ueber Pasigraphie und Ideographie* (Nuremberg, 1808); and Riem, *On a Written Language and Pasigraphy* (in German, 1809). A universal spoken language (*pasilaly*) is also a desideratum. See *Language*.

PASIPHAE; in heathen mythology, daughter of Sol and Perseis, and wife of Minos, king of Crete, to whom she bore Deucalion, Glaucus, Ariadne, and Phædra. Blinded by Neptune, who wished to punish Minos for not having sacrificed a bull to him, or, according to others, by Venus, who had sworn vengeance against the whole family of Sol because he had betrayed her intrigue with Mars, she was inflamed with an unnatural love for the bull. Her desires were gratified by means of the wooden animal made by the ingenious Dædalus, and the Minotaur was the fruit.

PASQUIL; derived from *Pasquino*. (q. v.)

PASQUINO, PASQUINADE. Pasquino was a cobbler, who lived, above 300 years ago, in Rome, and was so much celebrated for his caustic satire and wit that his shop was much visited by persons desirous to hear him. Soon after his death, a beautiful but mutilated statue (according to some, that of Menelaus) was dug up not far from Pasquino's shop, and put up in a corner of the Ursini palace. The people unanimously called the statue *Pasquino*, and satirical placards were attached to it—put, as it were, into the mouth of the revived Pasquino. Another statue, called *Marforio* (q. v.), supposed to be a corruption of *Martis forum*, stood opposite Pasquino; and questions were generally attached during the night to Marforio, which were answered by Pasquino. For instance, pope Sixtus V. had taxed several articles of food, and on Sunday Pasquino appeared with a wet shirt, as if to dry it in the sun. Marforio inquired why he did not wait till the next day to dry his shirt; to which Pasquino replied, "I am afraid to lose any time, for to-morrow I may have to pay a tax for sunshine." These two statues now lie in the court of the capitol. The Italian words *pasquinata* and *pasquillo* have been adopted in several other languages, and in some, as French and German, are even used in legal language for libel.

PASS, or PASSADE, in fencing; an advance or leap forward upon an enemy. Of these there are several kinds, as passes within, above, beneath, to the right, the left, and passes under the line, &c.

PASSAGE, Birds of. See *Migration*, and *Ornithology*.

PASSAIC FALLS. See *Cataract*.

PASSAMAQUODDY; a bay which forms a part of the boundary between Maine and New Brunswick. It is about twelve miles from east to west, and six from north to south. It contains a number of islands, of which the principal are Campo Bello, Deer, Moose, Dudley, and Frederick. The Passamaquoddy or St Croix river flows into this bay. See *Croix, St*.

PASSANT, in heraldry; a term applied to a lion, or other animal, in a shield, appearing to walk leisurely.

PASSAROWITZ, Peace of; concluded July 21, 1718, by Venice and the emperor Charles VI. with the Porte, at Passarowitz, a small town in Servia, at the confluence of the Morawa and the Danube, under the mediation of Britain and Holland. It terminated the war begun in 1714 by the Porte for the conquest of the Morea, in which the Turks succeeded in 1715. The emperor, as guarantee of the peace of Carlowitz (q. v.), took up arms for Venice in 1716. Eugene (q. v.) was victorious at Peterwardein, August 15th, 1716, and at Belgrade, August 16, 1717; after which the Porte determined to conclude a peace on the principle of *uti possidetis*, by which it retained the Morea, without a formal cession from Venice. Austria received Belgrade, with Servia, the bannat of Temeswar, Walachia to the Alute, and part of Croatia. See *Belgrade*.

PASSAU; capital of the Bavarian circle of the Lower Danube, in a romantic situation on the Danube and the Inn; population, 9000; lat. 48° 55′ N.; lon. 21° 29′ E. It has two suburbs—Innstadt and Ilzstadt—and several bridges. On a hill 400 feet high is the fortress Oberhaus, which is connected with the castle Niederhaus lying below it. It has some manufactures and considerable commerce. The principal public buildings are the cathedral (the old residence of the prince bishops) and the Jesuits' college. Passau is celebrated in history for the treaty concluded here August 22, 1552, by which the Protestants obtained the free exercise of their religion and the acknowledgment of their political rights. See *Reformation*, and *Charles V*.

PASSION FLOWER (*passiflora*); a beautiful genus of climbing plants, containing numerous species, remarkable for the elegance and singular form of their flowers. Their stems are woody, or, more frequently, herbaceous, provided with tendrils, and bearing alternate simple or lobed leaves; the flowers are axillary, and supported on peduncles; the calyx is widely-spreading, and divided into ten parts, the five interior of which have the form of petals, or are sometimes wanting. To the base of the calyx is attached an interior crown, composed of a great number of filaments. There are five stamens, which have their filaments united at base around the style. The fruit is a large one-celled berry, often, indeed, approaching a gourd in size, containing numerous seeds, and in many species is edible, though not rich in flavour. The water-lemon of the West Indies (*P. laurifolia*) bears fruit as large as a hen's egg, containing a whitish watery pulp, which has a peculiar aromatic, delicately-acid flavour, and allays thirst agreeably.—The sweet calabash of the same countries (*P. maliformis*) has the fruit of the size of an apple, enclosing a sweetish pulp. It is often called *granadilla*, together with several other species, and is served up in deserts. The sirup and decoction of the flowers of the *P. murucuja*, also a native of the West Indies, are much used as a narcotic, and afford a good substitute for opium.

PASSION OF CHRIST; the crucifixion of Jesus, with all its attendant sufferings. It is celebrated in the Catholic and most Protestant churches on the European continent during Lent (the seven weeks preceding Easter), and particularly during the Passion-week (the week preceding Easter), by sermons relating to the sufferings of the Saviour. The Catholics fast during Lent. The churches, and especially the altars, are deprived of their ornaments; the bells are not rung; public amusements are discontinued. The season of Lent is preceded, in most countries, by the carnival. In Rome, the celebration of the Passion-week in the *Capella Sistina* is famous on account of the incomparable music in the papal chapel. There the compositions of Palestrini, Pergolese, Allegri, and others, are heard in the purest style. The *Officium Hebdomadæ Sanctæ juxta Formam Missalis et Breviarii Romani sub Urbano VIII.* contains the rites of worship in the Passion-week prescribed by the Catholic church. The passion of Christ formed the subject of the first theatrical representations, which were prepared by the clergy, and thus, strange as it may seem, became the origin of the modern theatre. See *Comedy*, *Mysteries*, *Drama*, and *Theatre*.

PASSION-WEEK. See *Passion of Christ*.

PASSIVE and ACTIVE TRADE. By *active trade*, writers understand that which a nation carries on in foreign marts, whither it transports articles of commerce, and receives the returns; by *passive commerce*, that which it carries on with foreigners who come to its marts to sell and to buy. Some attach to active commerce the further idea of an advantageous balance of trade. (See *Mercantile System*.) It is an erroneous notion, which has led several governments to injurious laws, that the active commerce is always better than the passive.

PASSOVER (Hebrew, *pasa*, a sparing, a passing over); the Jewish feast, in commemoration of the sparing of the Israelites, when the first-born of the Egyptians perished, and of their escape out of Egypt. It was celebrated on the first full moon of the spring, from the 14th to the 21st of the month Nisan. (See *Easter*.) To this festival, as long as the Israelites remained in possession of Palestine, they assembled originally at the tabernacle, and from Solomon's time, at the temple. During the eight days of the feast, they were permitted to eat only unleavened bread, because their hasty departure from Egypt had obliged them to take their dough with them before it was leavened; hence the passover was also called the "feast of unleavened bread." Every householder, with his family, ate, on the first evening, a lamb killed by the priest, which was served up without breaking the bones. Thanksgiving, and the relation of incidents from the history of the Exodus, gave this festival its religious character. Offerings of firstlings of the flocks and herds, and first fruits, were also presented in the temple. The passover was the principal Jewish festival, and is still observed by the Jews, by eating unleavened bread and by public prayers.

PASS PAROLE; a command given, which passes from mouth to mouth along the line of a regiment or army.

PASSPORT; an instrument given to travellers by the proper authorities, describing their persons, purposes, and destinations, intended to show that their characters are good, and their objects in travelling lawful. *Passport* also signifies a license for importing contraband goods, or for exporting and importing merchandise free of duties. These last are always given to ambassadors, and other public ministers, for their baggage, equipage, &c.

PASSWAN OGLU. See *Widdin*.

PASSY; a village not quite a league from the centre of Paris. Its vicinity to the capital, the Bois de Boulogne, and the river, renders it peculiarly interesting. It is likewise esteemed for its mineral waters, the salubrity of its air, and its charming views in every direction. It is much visited by the Parisians, in summer, for the promenade, the *fête champêtre* at Ranelagh, &c. Franklin resided here while in France.

PASTE; a glass made in imitation of gems. The base of all artificial stones is a compound of silex, potash, borax, red oxide of lead, and sometimes arsenic. Pure boracic acid and colourless quartz should be used. Hessian crucibles are better than those of porcelain. The fusion should be continued in a potter's furnace for twenty-four hours. The more tranquil and continued it is, the denser the paste, and the greater its beauty.

Pastes.	1	2.	3.	4.
Rock crystal,	4056 grs.		3456	3600
Minium,	6300 "		5328	
Potash,	2154 "	1220	1944	1200
Borax,	276 "	300	216	360
Arsenic,	12 "	12	6	
Ceruse of clichy,		8508		8508
Sand,		3600		

Topaz.	No. 1.	No. 2.
Very white paste,	1008	3456
Glass of antimony,	43	
Cassius's purple,	1	
Peroxide of iron,		36

Ruby; paste, 2880, oxide of manganese, 72.—*Emerald*; paste, 4608, green oxide of copper, 42, oxide of chrome, 2.—*Sapphire*; paste, 4608, oxide of cobalt, 68, fused for thirty hours.—*Amethyst*; paste, 4608, oxide of manganese, 36, oxide of cobalt, 24, purple of cassius, 1.—*Beryl*; paste, 3456, glass of antimony, 24, oxide of cobalt, 1½.—*Styrian garnet*; paste, 502, glass of antimony, 256, cassius's purple, 2, and oxide of manganese, 2. In all these mixtures, the substances are blended by sifting, fused very carefully, and cooled very slowly, being left on the fire from twenty-four to thirty hours.

PASTEL, or PASTIL; a kind of paste composed of several colours, and ground up with gum-water, either together or separately, in order to make crayons to paint with on paper or parchment. (See *Crayon*, and *Drawing*.) This kind of painting possesses some advantages over the modes more commonly practised. Its great defect is its want of durability.

PASTORAL, or IDYL (εἰδύλλιον, a little image or picture, thence a little poem), is the general name of those poems which represent men in the simplicity and innocence in which they are thought to have lived before the origin of civic relations, and the vices thence resulting. When we look back in imagination to an original state of man, we naturally refer it to a shepherd's life, since feeding flocks and tilling the ground were the first occupations of man, and are older than civil society. As the first strains of poetry must have been heard in the primitive times of the human race, and as a shepherd's life is congenial with this mode of occupation, we naturally consider poetry as having originated in the pastoral period. The wonders of nature which lay every moment before the shepherd's eyes, must have kindled in his breast poetic fire. The proper idyl, however, as a peculiar style of poetry, had its origin in a corrupt state of society, on account of the desire of men for a better and more natural state of life. The poetic idea of pastoral life, however, is not supported by experience; for the shepherds of the present day are rude and barbarous, whether living in tribes, or forming a class in the midst of men of other occupations. There have been both epic and dramatic idyls. To the epic belong the pastoral romances of ancient and modern poets; also the *Luise* of Voss, and the Hermann and Dorothea of Goethe, &c., and, in a more limited sense, the greater part of the idyls of Theocritus, and his imitators, Virgil and Calpurnius. Among the dramatic are Guarini's *Pastor Fido*, Gesner's *Evander*, and several other pieces of the moderns, to which may be added the *satyrica* of the Greeks. The greater part of the bucolics and eclogues, of the ancients and moderns, are lyric. The idyl must show a world in which nature alone gives laws. Restrained by no civil customs, by no arbitrary rules of politeness, men must there give themselves up to the impressions of nature. They know no wants but those which nature imposes, and no blessings but the gifts which she bestows. Their principal passion is love, but love without restraint, without dissimulation, without Platonic sublimity. Their arts are bodily exercises, singing and dancing: their riches fruitful flocks; their utensils a shepherd's crook, a flute, and a cup. There are also allegoric idyls, among which are the first and tenth eclogues of Virgil, the idyls of Madame Deshoulières, and, in a measure, Pope's Messiah. The principal writer of idyls among the ancients was Theocritus, who has likewise represented the most simple relations of city life. He was followed by Bion and Moschus. Pope has imitated Virgil in four pastorals; and Gesner was regarded by some former critics as a model for pastoral poets. His fame, however, has diminished.

PASTORALE, in music; a rural composition, of an idyllic character; also a composition for a dance in this character, generally in six-eighth time.

PASTORALE (*collegium pastorale*) is used to designate that part of theology which includes the execution of the duties of the clergyman, the application of his theological knowledge—the practical part of theology. It is also called *pastoral theology*, *pastoral science*, *pastoral wisdom*, or *pastoral prudence*. But the latter, the *prudentia pastoralis*, more frequently includes only certain rules of prudence which experience has shown to be important for the execution of clerical duties. According to the widest meaning of the *pastorale*, it is to be divided into as many heads as there are branches of the official duties of a divine. In respect to his office as teacher, it comprises, therefore, 1. pulpit eloquence; 2. catechesis (q. v.); 3. liturgics, in its widest sense, the administration of the sacraments, the service at the altar and before the congregation; 4. every thing which is necessary for a clergyman to know as the adviser, comforter, and leader of his flock, the duties of the confessional, the consolation of the sick and sorrowful, the preparation of the sick and the condemned criminal for death, and every thing which is requisite for the maintenance of church discipline, so that, with Catholics, the chief part of the canon law is comprised in it. Catholics call, also, the official collection of all the ceremonies attached to the administration of the sacraments, and the other public duties of the clergyman, the *pastorale*. It is pretty much the same as that which is better known under the name of *Rituale Romanum*, except that this has received the papal revision and confirmation. Thus the *pastorale* of the Roman Catholic is a written code, while that of the Protestant minister consists of principles addressed merely to his understanding.

PASTORAL THEOLOGY. See *Pastorale*.

PATAGONIA; a vast country, occupying the southern extremity of South America, and extending from lat. 35° 38′ S., where it borders on the province of Buenos Ayres and Chile, to cape Froward, on the straits of Magellan, in lat. 53° 54′ S., a distance of about 1100 miles. Little is known of this extensive region, which has not been colonized by any European nation, and has never been thoroughly explored by travellers. It was discovered by Magellan in 1519, and was visited by Byron in 1764, and by Wallis in 1766. In 1782, the coasts were surveyed by the Spaniards, whose chief attention was, however, directed to the examination of the straits of Magellan: previous to that time, it was uncertain whether there was not a navigable channel farther north than those straits. In 1826—1830, captain King examined the coasts of Patagonia and Tierra del Fuego, and corrected the errors made by the Spaniards in their survey. The western coast he found to be bordered by a range of islands, in the rear of that usually laid down on the maps, and equal to it in breadth. Tierra del Fuego was also found to be intersected by a navigable channel, which captain King called Beagle channel. (See his *Observations on the Geography of the southern Extremity of South America, Tierra del Fuego*, &c., read before the geographical society of London in May, 1831, and published in their Journal for 1831.) The Andes, in this part of the continent, are about 3000 feet high on an average, and the deep inlets which form the numerous archipelagos and peninsulas of the western coast, penetrate quite to their base. The climate, as might be expected, from the high latitude of the country, is rigorous; yet the plants and birds of the warmer regions are found here. The natives bear among themselves the names of *Moluches*, or *Warriors*, and *Puelches*, or *Easterns*. One of the tribes of the former, from their inhabiting Arauco, has received from the Spaniards the name *Araucanos*. (See *Araucanians*, and *Ercilla*.) One tribe of the Puelches is the people known to voyagers under the name of *Patagonians*. They are a nomad people, and wander from the straits of Magellan to the pampas (q. v.) of Buenos Ayres, a distance of about 1000 miles. They are often engaged in hostilities with the Spaniards, and are formidable by their courage and numbers. "They are a large-bodied people," says Falkner, who resided in the country forty years, and wrote the best account which we have of the interior (Description of Patagonia, 1774), "but I never heard of that gigantic race which others have mentioned, though I have seen persons of all the tribes of southern Indians."—From Chile to the Magellanic strait, a great part of the country seems to be bleak, mountainous, and barren. The interior, in many places, produces good timber. Much of the country near the western coast is dry and barren, and uninhabited. Deer, guanacos, wild horses, pumas, jaguars, ostriches, and other animals, are found in Patagonia. See *South America*.

PATAM, or PATNAM; the ending of several Hindoo names for places, signifying *town*: for example, *Seringapatam* (city of Vishnoo, or Srinanga.)

PATAPSCO; a river of Maryland, which runs south-east into Chesapeake bay, between North point and Bodkin's point. It is navigable to Fell's point, in Baltimore, fourteen miles, for ships drawing eighteen feet of water.

PATENT, in law, is the exclusive right of using and vending a certain composition or combination of matter, as a medicine or a machine. This right is not derived from the law of nature, as the whole field of inventions and improvements is open to all men, and one cannot monopolize a part of it by prior discoveries. By the common law of England, monopolies were declared to be generally void, and patents for new inventions, being a species of monopolies, would, according to this doctrine, be void by that law. But they seem to form an exception to this rule; for it was held that the king could confer on the inventor of any useful manufacture or art the power of using it for a reasonable time. But the law of patents, as it now stands in England, rests upon a statute of 21 Jac. I. c. iii. and in the United States of America, on statute Feb. 21, 1793, and April 17, 1800. In France, until 1790, inventors were generally obliged to keep their discoveries secret, in order to secure to themselves a small part of the benefit of them. In an early period of the French revolution, a law was passed in favour of new inventions, formed on the basis of the English statute. The French law of Jan. 7, 1810, declares that every discovery or new invention, in every species of useful industry, is the property of its author. In England, patents are now, as they were before the statute of James I., granted by the crown. Letters patent are made out by the secretary of state in the name of the United States of America, bearing *teste* of the president.

What is patentable? In general, any invention of a new and useful art, machine, manufacture, or composition of matter not known or used before, or any new and useful improvement in any art, machine, or manufacture, or composition of matter. The invention must be *new*. In England, a manufacture newly brought into the kingdom, from beyond sea, though not new there, is allowed by the statute of James; because that statute allows a patent for any new manufacture within this realm. By the patent law of the United States of America, if the thing patented was not originally discovered by the patentee, but had been in use, or had been described in some public work anterior to the supposed discovery by the patentee, or if he has surreptitiously obtained a patent for the discovery of another person, the patent is void. In France, by the law of Jan. 7, 1810, whoever introduces into that kingdom a foreign discovery shall enjoy the same advantages as if he were the inventor. In England, the publisher of an invention is entitled to a patent, whether he be the inventor or not. The subject of a patent must be vendible, in contradistinction to any thing that is learned by practice. The invention must be *material* and *useful*: thus the substitution of one material for another is insufficient to support a patent; as of brass hoops to a barrel instead of wooden ones. So there cannot be a patent for making in one piece what before was made in two. But if one elementary thing be substituted for another, as if that be done by a tube which was before done by a ring, a patent for the improvement would be good. It must not be hurtful to trade, nor generally inconvenient, nor mischievous, nor immoral, as an invention to poison people, or to promote debauchery. Patents for improvements are valid, as for an improved steam-engine; but if the improvements cannot be used without the engine which is protected by a patent, they must wait the expiration of the patent. But a new patent may be taken out for the improvement by itself. A combination of old materials, by which a new effect is produced, may be the subject of a patent. The effect may consist either in the production of a new article, or in making an old one in a better manner, in a shorter time, or at a cheaper rate. A patent may be obtained for a method or process by which something new or beneficial is done, when it is connected with corporeal substances, and is carried into effect by tangible means, as in the case of Watt's steam-engine, which was described to be a method of lessening the consumption of fuel in a steam-engine. So a chemical discovery, when it gives to the community some new, vendible, and beneficial substance, or compound article, is a subject of a patent, as medicines, &c. But a patent for a mere curiosity is void. If the manufacture in its new state merely answers as well as before, the alteration is not the subject of a patent: nor is a mere philosophical abstract principle, nor the application or practice of a principle, the subject of a patent. No patent can be obtained for the expansive operation of steam; but only for a new mode or application of machinery in employing it.

Right how lost. The inventor may lose his right to a patent by using, or allowing others to use, his invention publicly. It was considered that Dr Hall had not lost the right to a patent for his discovery of the object-glasses, because he had not made it known to others, though it was not immediately patented. If the secret of an invention is known only to a few persons, and one of them puts it in practice, then a patent afterwards obtained by any one of them is void. This happened to Mr Tennant, because a bleacher, who had not divulged the secret to any other person but his two servants, had used the same kind of bleaching-liquor for several years anterior to the date of Tennant's patent. Where a person who sought a patent for making spectacles incautiously told an acquaintance of the principle of the invention, by which means a person of the same trade made a similar pair, and the inventor, seeing them in a shop window, employed a friend to purchase them for him, and the patent was afterwards granted, it was said to be secure. The question does not, however, appear to have been brought before a court, and Mr Godson thinks that the patent was void. A patent for British imperial verdigris was declared to be void, because the inventor had, four months prior to the sealing of the grant, sold the article under a different name. Whether experiments made with a view to try the efficacy of an invention, or the extent of a discovery, are a *using*, and dedicating the invention to the public, within the statute of James, has not been decided; but it would be difficult to say how much a substance or machine might be used without running great risk of invalidating the right to a patent. In France, if the inventor do not, within two years, put his discovery into activity, or do not justify his inaction, the patent is annulled.

Duration of the Patent. In England and the United States of America, patents are granted for a term not exceeding fourteen years. The time in England may be prolonged by a private act, and, in the United States of America, by act of congress. In France, by the law already mentioned, patents are given for five, ten, or fifteen years, at the option of the inventor; but this last term is never to be prolonged without a particular decree of the legislature. The duration for imported discoveries is not to extend beyond the term fixed for the privilege of the original inventor in his own country. In France, if the inventor obtains a patent in a foreign country after having obtained one in France, the patent is annulled.—*Caveat.* In England, a *caveat* is an instrument by which notice is requested to be given to the person who enters it, whenever any application is made for a patent for a certain invention, which is therein described in general terms. It must be renewed annually. It is simply a request that, if any other person should apply for a patent for the same thing, the preference may be given to him who entered it. In the United States of America, in case of interfering applications for a patent, they are submitted to the arbitration of three persons, appointed one by each applicant, and one by the secretary of state.

Specification. The invention for which a patent is granted must be accurately ascertained, and particularly described. The disclosure of the secret is the price of the monopoly. The specification must be such, that mechanics may be able to make the machine by following the directions of the specification, without any new inventions of their own. The patent and specification are linked together by the title given to the invention in the patent, and the description of it in the specification. The specification must support the title of the patent: thus a patent taken out for a *tapering-brush* is not supported by the specification of a brush in which the bristles are of unequal lengths. It must point out what parts are new and what old. It must not cover too much: if it does so, it is not effectual, even to the extent to which the patentee would be otherwise entitled; as, if there be a patent for a machine and for an improvement upon it, which cannot be sustained for the machine, although the improvement is new and useful, yet the grant altogether is invalid, on account of its attempting to cover too much. A patent for a new method of drying and preparing malt is not sustained by a specification in which is described a method for heating, &c., ready-made malt: so a patent for an invention founded on a principle already known, for lifting fuel into the fire-grate from below the grate, in the specification whereof was described a new apparatus, was held to be bad for not claiming the new instrument as the thing invented: so when a patent was "for a new method of completely lighting cities, towns, and villages," and the specification described improvements upon lamps, the patent was held to be void. The subject must be given to the public in the most improved state known to the inventor. A patent, in England, for steel-trusses, was held to be void, because the inventor omitted to mention that, in tempering the steel, he rubbed it with tallow, which was of some use in the operation. The specification must not contain a description of more than the improvement or addition. If there be several things specified that may be produced, and one of them is not new, the whole patent is void. In England, if any considerable part of a manufacture be unnecessary to produce the desired effect, it will be presumed that it was inserted with a view to perplex and embarrass the inquirer: thus, in 1 Term Reports, 602, in Turner's patent for producing a yellow colour, among other things, *minium* is directed to be used, which, it appeared, would not produce the desired effect, and, for this reason, the validity of the patent might be impeached. In the specification of Winter's patent, 1 Term Reports, 602, a great number of salts were mentioned, by which it appeared that either might be used to make the subject of the patent, but only one would, in fact, produce the effect; and, for this reason, the patent was held to be void. If the patentee makes the article of cheaper materials than those which he has enumerated in his specification, although the latter answer equally as well, the patent is void. In England, if the improved manner of using the invention be unintentionally left undescribed, still the patent is void. (1 *Mason's Reports*, 189.) In France, the general rules, in these respects, are similar.

Enrolment. In England, a patent is void unless it is enrolled. The time allowed for the enrolment is now generally confined to one month. Enrolment cannot be dispensed with, though it be to keep the specification secret. After a patent has passed, the time for enrolment cannot be enlarged without an act of parliament. In the United States of America, the patent, after the seal of the United States of America is affixed, is recorded in a book kept for the purpose.

Infringement. Whether any act is really an infringement of the patent, is a question for the jury. The using the least part of the manufacture is an infringement. In Manton *v.* Manton, the infringement consisted in making a perforation in the hammer of a gun in a direction a little different from that in the patent article. If the article manufactured be of a different form, or made with slight and immaterial alterations or additions, if the manufactures are really and substantially the same, the patentee is entitled to a remedy, as where the position of the different parts of a steam engine were reversed. Where several independent improvements are made in the same machine, and a patent is procured for them in the aggregate, the patentee is entitled to recover against any person who shall use any one of the improvements so patented, notwithstanding there shall have been no violation of the other improvements.—*Remedy for Infringement.* The remedies for infringement, in England, are by an action at law for the damages, or by proceedings in equity for an injunction and account. The remedy sought in equity is for instant relief, and it is often preferable to proceed in equity before a suit is commenced at law. In the United States of America, the circuit court has original cognizance, as well in equity as at law, in regard to patents, and may grant injunctions. The damages for a breach of the patent right, in the United States of America, are three times the actual damage sustained by the patentee: the jury are to find single damages, the court are to treble them. In France, the patentee, in case of infringement, shall recover the damage he may sustain, and a penalty for the benefit of the poor, not to exceed 3000 francs, and double in case of a second offence.—*Repeal.* If a patent be void, in England, the king may have a *scire facias* to repeal his own grant. All persons are injured by the existence of an illegal patent for an invention, and every one is therefore entitled to petition for a *scire facias* to have it cancelled. Patents are repealed, in the United States of America, by a process in the nature of a *scire facias.*—*Who may obtain a Patent.* Aliens who have resided two years in the United States of America are allowed to obtain patents under the act of 1800, on their making oath that the invention has not, to the best of their knowledge or belief, been used in any country before. The English law has no restrictions on this head, and it is every day's practice to grant patents for new inventions to Americans and other foreigners.

An act has been passed in a late session of parliament to do away with some of the defects with which our antiquated patent laws are encumbered; and although it does not pretend to an entire removal of the causes of complaint, yet considering the admitted difficulties of the case, and the very objectionable nature of some of the former propositions for amendment, we are not sorry that the work of improvement has been begun with caution; at the same time we wish to consider what has been done only as a beginning, and hope it will lead the way to a general amelioration.

One great grievance of the system, was the destruction of all right to a patent which resulted from an inadvertent claim put in to any part of an invention which might not actually be new, although that circumstance should be unknown to the inventor, and even although the part claimed should be a small and unessential portion of the whole invention. To make this matter clear, it must be stated that, in explaining the nature of an invention, such as a machine for instance, the patentee is compelled to describe the construction of his invention in the fullest detail, so as to enable an ordinary workman to construct a similar machine. As in every such new invention, certain parts must also necessarily be well known, certain wheels and levers will be like wheels and levers in other machines; and as to these wheels and levers the patentee can have no exclusive right, he is expected to declare in his specification what parts of the machine he claims as his own invention. To these alone he has exclusive right; all other parts are public property, and may be used by any one. Thus far all is right; if it were otherwise, a patentee might be allowed a right to what is not his own. The grievance complained of is, that if a patentee should inadvertently lay claim to any part of his new invention, which part might afterwards be found not original, he lost not only his right to an exclusive use of that one part, but to the entire invention, however new it might be. He was thus cooped up in a dilemma; if he did not claim the whole of his invention, from a fear of overclaiming, he of course lost his right to that which he did not claim; if, on the contrary, he claimed all which was his own, and it should be found that some part was not original, then he lost his whole patent. The motive to this severity seems to have been the wish to prevent by a penalty an unprincipled schemer from endeavouring to appropriate to himself more than his own. But while the schemer was punished, the honest inventor was often a sufferer. A new machine might have great merit, it might in principle and action be perfectly new; but some of its details might have been used in some other machine now in disuse, quite unknown to the inventor. This is discovered by some rival manufacturer, and the patentee loses his right. By the act now passed, this grievance is done away with; if a patentee should be in the situation supposed, if he should find that some portion of his invention has been anticipated, he may now, on a proper representation, obtain leave to enter and enrol a disclaimer of such portion, and remain in the situation he would have been in, had no such claim ever been put forward.

It has been objected to this alteration, that advantage may be taken of it by a dishonest schemer, who may take out a patent for an invention not his own, and then, as he finds himself discovered, enter a disclaimer, first to one part and then to another, as such parts are objected to, and in the mean time reap all the advantage of his patent, as though the invention were his own. This we imagine is an impossible occurrence; it must be remembered that the enrolment of the disclaimer is not a matter of right, that it may be refused by the attorney-general, unless a sufficient cause is alleged for the alteration, and that in case of fraud it would undoubtedly be refused. There is also another check, and a strong one, against such a practice: the disclaimer cannot be received in evidence, in case of an action brought before such disclaimer was enrolled. A patentee, therefore, who should make an overclaim, and against whom an action should be brought in consequence of that overclaim, will, as far as that action goes, stand precisely in the situation he would have stood in before the new act was passed. He will be liable to the same penalties, and be put to the same expense in the suit. The only difference is, that he will be enabled to protect himself from the loss of his whole patent in such a case, and will stand upon his own right in future. Now an honest patentee will, it is true, suffer in the immediate action the penalty of his inadvertence, but no more. The dishonest one will render himself liable to the same penalty, as often as he shall attempt to make use of any right given him by a fraudulent claim.

The second clause enacts, that if a patentee shall have reproduced some old invention, believing himself to be the inventor, it shall be in the power of the crown, upon a recommendation of the judicial committee of the privy council, to continue the patent to the patentee, wherever it shall appear that the invention has not been publicly and generally used. It is feared by some persons that all kinds of old inventions will be brought up again, and promulgated as new, under favour of this clause, and that every body will be taking out patents for old and abandoned projects. This appears very absurd. To say nothing of the expense of taking out patents, and the almost certainty of their being useless to the patentee (for we may be well assured, that in ninety-nine cases out of a hundred, the inventions would not have been abandoned if they had not been useless,) there are so many checks against the continuance of such patent by the crown to any but a *bonâ fide* re-inventor, that few persons will feel inclined to rake out old books for the purpose of picking up lost inventions. If any person should be lucky enough to re-produce an invention of value abandoned from any cause, and generally forgotten, we see no harm in his having the monopoly of its use for a few years, as a recompense for his bringing to light a valuable idea, though we would rather he should be entitled to it without any misrepresentation.

The third clause contains a provision against the repeated vexatious actions by which a patentee might be put to enormous law expenses under the former act. Before the passing of the new law, although an action respecting the validity of a patent might be decided in favour of the holder of the patent, this verdict was no bar to a future action, nor to any number of future actions. Although nothing new could be alleged, although it was but going over the same ground again and again, the patentee might be compelled year after year to defend himself against fresh actions to his great injury, perhaps to his ruin. The clause enacts, that in any action respecting the validity of a patent, if a verdict pass in favour of a patentee, the certificate of the judge who tried the action may be adduced in evidence on any future action; and if the verdict in such subsequent action be given in favour of the patentee, he shall receive treble costs.

By the fourth clause, an extension of the term of a patent, not exceeding seven years, may be granted by his majesty, on a recommendation of the judicial committee of the privy council, who may call and examine witnesses in the case of a petition for extension. This is decidedly an improvement: the term of fourteen years granted indiscriminately by every patent, is too short, in some cases, to render any profit to an inventor, and this chiefly in those inventions of great value which require time to introduce. We may instance Watt's improvements on the steam-engine, which, from prejudice and other causes, were hardly in general use when the term granted by his patent expired. By the old act, no extension could be obtained without an application to parliament, which was attended with so many difficulties that it has been rarely resorted to.

The fifth and sixth clauses refer to the manner of conducting trials for infringement of patent rights, and regulate the costs in such actions. The last clause inflicts a penalty upon any person putting the name or mark of a patentee upon any article without his permission.

Here follows a more detailed abridgment of the act. *An act to amend the Law touching Letters Patent for Inventions.* [5 and 6 Will. IV. c. 83.—10th September, 1835.]

1. Reciting that it is expedient to make certain additions to and alterations in the present law touching letters patent for inventions, as well for the better protecting of patentees in their rights, as for the more ample benefit of the public: enacts, that any person having obtained letters patent for any invention may enter with the clerk of the patents of England, Scotland, or Ireland, respectively, as the case may be, having first obtained the leave of his majesty's attorney-general, or solicitor-general, in case of an English patent, of the lord-advocate or solicitor-general of Scotland in the case of a Scotch patent, or of his majesty's attorney-general or solicitor-general for Ireland in the case of an Irish patent, certified by his fiat and signature, a disclaimer of any part of his specification, or a memorandum of any alteration therein, not being such as shall extend the exclusive right granted by the said letters patent; and which, when filed, shall be deemed part of such specification; but a caveat may be entered as heretofore; and such disclaimer shall not affect actions pending at the time; and the attorney-general may require the party to advertise his disclaimer.

2. Where a patentee is proved not to be the real inventor, though he believed himself to be so, he may petition his majesty in council to confirm his letters patent, or grant new ones; and the said petition shall be heard before the judicial committee of the privy council, who, on being satisfied that such patentee believed himself to be the first and original inventor, and that such invention had not been generally used before the date of such first letters patent, may report their opinion that the prayer of such petition ought to be complied with, whereupon his majesty may, if he think fit, grant such prayer; but any person opposing such petition shall be entitled to be heard before the said judicial committee: and any person, party to any former suit touching such first letters patent, shall have notice of such petition.

3. If any action or suit, a verdict or decree, shall pass for the patentee, the judge may grant a certificate, which being given in evidence in any other suit, shall entitle the patentee, upon a verdict in his favour, to receive treble costs.

4. Allows a patentee, on advertising as therein mentioned, to apply to the privy council for a prolonged term. If the judicial committee report in his favour, his term may be prolonged for seven years; but such application must be made before the expiration of the original term.

5. In case of action, &c., notice of objections to be given with the pleadings.

6. Costs in actions for infringing letters patent, to be given as either party has succeeded or failed in any part of his case, without regard to the general result of the trial.

7. Penalty for using, unauthorised, the name or device of a patentee, &c., £50, one half to his majesty, and the other to any informer.

Mr Farey, who has had much experience in superintending the taking of patents, states, that the average expense of a patent for England, may be estimated at £120; for Scotland, at £100; and for Ireland, £125.

PATERA; a small dish or vase, in which the Greeks and Romans offered libations of wine to the gods at festivals and sacrifices, and in which they received the blood of offered victims. It was also a mark of the deity and his worship. It is seen upon altars, and in the hands of officiating priests.

Patella, a smaller sort, gave to the household gods the name *Patellarii*.

PATERCULUS, CAIUS VELLEIUS, an ancient Roman historian, was born in the year of Rome 736, of a family in Campania, which had borne various important offices in the state. He served under Tiberius in Germany, as commander of the cavalry, and, in the first year of that emperor's reign, was nominated pretor. Nothing further is known of him; but the praises he bestowed upon Sejanus have led to a supposition that he was a partisan of that minister, and involved in his ruin. His death is placed by Dodwell in the year of Rome 784, in his fiftieth year. Paterculus composed an abridgment of Roman history, in ten books, of which the greater part has perished, and, unfortunately that which remains is incurably corrupted, only one manuscript having been discovered. His style is pure and elegant, and he excelled in a brief and forcible manner of drawing characters; but his connexions with Tiberius and Sejanus rendered him an adulator of those detestable personages, and warped his representations of the actions and characters of the republican party. The most esteemed editions of this classic are those of Burmann (Leyden, 1719), of Ruhnkenius (Leyden, 1779), and of Krausius (Leipsic, 1800).

PATERNOSTER; 1. the Latin for *our Father*, or the Lord's prayer; 2. every tenth large bead in the rosary which Catholics use in their devotions; at this they repeat the Lord's prayer, and, at the intervening small ones, only an *Ave Maria*; 3. the rosary itself.

PATHOGNOMIC, in medicine (from παθος, a disease, and γινωσκω, I know); an epithet signifying that a symptom or course of symptoms to which it is applied is inseparable from, or exclusively characteristic of a particular disease.

PATHOGONY (from παθος, suffering, and γονη, origin); the science of the origin of diseases; a part of pathology.

PATHOLOGY (from παθος, a disease, and λογος, doctrine or system) signifies the science or doctrine of diseases. As physiology teaches the nature of the functions of the living body in a state of health, so pathology relates to the various derangements of these functions which constitute disease. Its objects, therefore, are to ascertain the various symptoms which characterize the disorders of each organ of the body, and especially the diagnostic and pathognomic symptoms, which afford the means of discrimination between diseases that resemble each other; to determine the causes, both predisposing and exciting, by which diseases are induced; to point out the prognosis or the tendency and probable event of each disease, from the changing combination of the symptoms; and, lastly, to teach the indications of cure, and the nature and operation of the remedies adapted to the various circumstances and periods of diseases.

PATKUL, JOHN REGINALD, a Livonian patriot, was born in 1660. When Charles XI. of Sweden had encroached on the rights of the Livonian nobility, Patkul took an active part in remonstrating and obtaining a redress of grievances. One of his appeals on this subject (1692) induced the government at Stockholm to summon the provincial authorities, and Patkul in particular, to the Swedish capital. Patkul received a safe conduct, and went to Stockholm; but, fearful of the intention of the court, he withdrew into Courland, and was declared infamous, and condemned to lose his right hand and his head. After spending some time in Switzerland and France, he was received, in 1698, into the service of the Saxon court as privy counsellor, and used all his efforts to carry into effect the plan of a union with Russia and Denmark against Sweden. (See *Augustus II.* and *Charles XII.*) In 1702, he went to Petersburg, and the league with Russia was concluded. He now entered the Russian service, and, after being employed in various capacities, was sent as Russian ambassador to Augustus, and soon after received the command of the Russian auxiliaries, at the head of whom he captured Warsaw. Augustus had just renewed his alliance with Russia by a personal interview with the czar, when, in December, 1705, Patkul, with eighteen of his confidential friends, was arrested and thrown into prison, under pretence that he had entered into treasonable negotiations with Austria and Sweden, and had endeavoured to excite dissensions between the czar and Augustus. Augustus was soon after obliged to submit to the peace of Altranstadt (September 24, 1706), in which the surrender of Patkul to Sweden was stipulated. He was accordingly delivered up to the Swedes, although Augustus had given secret orders that he should be permitted to escape. Peter in vain demanded the release of his ambassador. The Swedish troops are said to have tied him to a cannon on their march from Saxony, and he was tried by a court-martial at the monastery of Casimir, near Possen, and condemned to death. October 10, 1707, he was broken alive on the wheel: his head was cut off, and his body was quartered.

PATMOS. See *Sporades*.

PATNA; a city of British India, in the presidency of Bengal, on the Ganges, 250 miles northwest of Calcutta; population, 312,000. The city is about four miles long and one broad, enclosed by a brick wall, having small round bastions; but many parts are fallen to decay. It contains some mosques and temples, but the houses generally make a mean appearance. The houses of the Europeans are in the suburbs, called *Bankypore*, and are handsomely built of brick. The surrounding country produces the finest opium, and saltpetre, grain, indigo, and sugar. It carries on a large trade with Calcutta. It has been in the possession of the British since 1763, and is the residence of a provincial court of appeal, &c. It is supposed to be the ancient *Palibothra*.

PATOCKI, or BATOCKI; two thin sticks with which criminals were formerly beaten in Russia. The party was stretched on the ground, while one person sat upon his head, the other on his feet. The severity of the punishment may be judged of from the fact that it was abolished by the code of Catharine II. though the knout was left.

PATRAS (anciently *Patræ*); a town of the Morea in the Greek province of Achaia, on the gulf of Patras (see *Lepanto*); lat. 38° 14′ N.; lon. 21° 46′ E. It is well fortified, and its citadel was never taken by the Greeks, but capitulated to the French troops in 1828. Previous to the revolution, it contained about 10,000 inhabitants, chiefly Greeks, and was the emporium of the Morea. The town was almost wholly destroyed in the attacks on the citadel, but has already a population of 8000, who have built up temporary houses of rough boards. See *Greece, Revolution of.*

PATRIARCHS (from the Greek πατρια, family, *αρχων*, head) are the antediluvian heads of families, and the three fathers of the Hebrew race, Abraham, Isaac, and Jacob. The epithet *patriarchal* is hence used to denote the innocence and simplicity of the early ages, and the venerable dignity of age. The patriarchal government is that which prevails in a state of society in which the people are not yet organized into a nation, but from independent tribes, clans, or families, under the government of their common ancestor, or his representative, the existing head of the family. The term *patriarch*, at a later period, became the title of the presidents of the sanhedrim, which exercised a general authority over the Jews of Syria and Persia after the destruction of Jerusalem. The patriarchate of Tiberias for the Western Jews subsisted till 415, that of Babylon for the Eastern Jews, till 1038. From them, the title was adopted by the Christians, who applied it, from the beginning of the fifth century, to the bishops of Rome, Constantinople, Alexandria, Antioch, and Jerusalem. These patriarchs exercised the power of consecration, and of supervision over the archbishops and bishops within their jurisdictions. While the patriarch of Rome became the supreme pontiff of the West (see *Pope*), the four heads of the Eastern church preserved the title of *patriarch*, but were nearly stripped of their authority by the conquests of the Saracens. The Armenian, Abyssinian, Jacobite, and Maronite churches have their own patriarchs. The patriarch of Constantinople is the primate of the Greek church in the Ottoman empire, and bears the title of *œcumenical*, with the rank of a pacha of three tails. He is invested with his dignity by the sultan. (See *Greek Church*.) The patriarch of Moscow, whose authority extended over the Russian church, was superseded, during the reign of Peter the Great, by the holy synod. In the Catholic church, the archbishops of Lisbon and Venice have the title of *patriarch*. The latter has no superiority over other archbishops; the former is primate of Portugal. The patriarchate of Aquileia was divided, in 1750, into the archbishoprics of Udine and Gorz (since of Laybach).

PATRICIANS; a name given to certain families in Rome, distinguished for their origin, wealth, and honours, and from which the senators were chosen. After the manner of the Athenians, Romulus is said to have divided the Roman citizens into two classes,—patricians and plebeians. The former were originally called *patres* (fathers), because they were viewed as the fathers of the people. From this name was derived the title *patricians*. From these noblemen Romulus formed a senate of 100 persons, who filled the highest offices of state in war and peace, and performed the religious services of the temple till the year of the city 495. The members of this body were styled *senators* from *senectus* (age), because none were chosen but those who enjoyed the fullest confidence of the people from their age (which was required to be at least twenty-five years), their experience and their skill in the administration of public affairs. When the Sabines were received into Rome, 100 new members were added to the senate. On the fall of the republic, the number had increased to more than 1000; but the emperor Augustus reduced it to 600. A distinction was made between the *patres majorum gentium* (patricians of the older families), who were descended from the senators chosen by Romulus, and the *patres minorum gentium* (patricians of the younger families), descended from the senators added by Tarquin the elder. The political superiority of the patricians over the plebeians was secured to them by the right of patronage (*jus patronatus*); but they lost their privileges in the year of the city 261, when the plebeians obtained a complete political equality with the nobles (see *Rome*), and the highest offices became open indiscriminately to patricians and plebeians, and, after the year 308, intermarriages between the two classes were permitted. There was no longer any distinction except that arising from family descent. After this, a sort of nobility (*nobilitas*) was attributed to those who had enjoyed the three highest offices in the state (the offices of consul, pretor, and curule edile). This nobility was transmitted to their posterity by the *jus imaginum*—a right to set up in their porticoes the waxen images of their ancestors. It was not necessary for a person to be descended from a patrician family in order to enjoy this distinction; but it added to the honour of the nobility, particularly if accompanied with great merit. The dignity of the patricians was lessened by the fall of the republic, the civil wars, and the establishment of the imperial dignity. The conquest of Rome by the Goths, which deprived many of the patricians of their liberty or their lives, or compelled them to flee to Constantinople, led to the abolition of all distinction between patricians and plebeians. When the seat of government was removed to Constantinople, Constantine the Great, desirous of restoring the ancient Roman ranks, instituted a new patrician dignity, which was a mere personal title, and which could be acquired only by high birth and distinguished merits. Under the Carlovingians and the succeeding emperors, the title of patrician denoted an exalted rank, and was connected also with the government of Rome and its provinces, and the support of the papal see. Charlemagne assumed the title of a Roman patrician, before he was declared emperor, and Henry IV., as such, deposed pope Gregory VII. In modern times, a few noble families, in the imperial cities were called *patricians*, because they were especially entitled to certain high offices. The patricians arose in the twelfth and thirteenth centuries, when the fear of depredations in the open country, and the flourishing state of the cities, induced many noblemen to settle in them. See *Nobility*.

PATRICK, St, the apostle of Ireland, was born, according to some accounts, in Kilpatrick, Dumbartonshire, Scotland, according to others, in Brittany, near the end of the fourth century, and in his youth was carried to Ireland by some freebooters, and employed in keeping sheep. After spending six years in Ireland, he finally returned home, but, as he relates in his Confessions, was moved by visions to undertake the conversion of the Irish to Christianity. In spite of all obstacles, he preached the Christian doctrine among them, and made many converts. He established churches and schools, ordained priests, as bishop of Ireland, and created bishops. The last years of his life were devoted to acts of piety and religious meditation, and he died, at an advanced age, in 493 or 483. His works, containing his Confessions, were published with remarks by Ware (London, 1656).

PATRIMONIAL or HEREDITARY JURISDICTION; that jurisdiction which a person exercises over others by right of inheritance, or as owner of an estate. It has its name from being considered part of the inheritance (*patrimonium*). It exists still in some parts of Germany, sometimes, though rarely, including even criminal jurisdiction. See *Manor*.

PATRIMONIUM PETRI (*Patrimony of Peter*) is the name of a part of the papal dominions; a province which it is pretended that the emperor Constantine gave to the pope in the fourth century, but which, in reality, came to the popes in the twelfth century, by a grant of Matilda, countess of Tuscany. See *Constantine*, *Matilda*, and *Pope*.

PATRIOT. In the Latin of the middle ages, *patriota* signified a native, in contradistinction to *peregrinus*, a foreigner, i. e. one who did not enjoy the rights of citizenship. As the native, i. e. the citizen, was considered to be attached by his interests to the commonwealth, the word gradually received the meaning of a citizen who loves his country. In the French revolution, it meant a democrat, an adherent of the revolution.

PATRISTICS, THEOLOGIA PATRISTICA; that branch of historical theology, which is particularly devoted to the lives and doctrines of the fathers of the church. The German Protestants have recently paid particular attention to it, as affording a satisfactory, though laborious way of arriving at the history of the Christian doctrine and constitution in the first six centuries. (See *Fathers of the Church*.) Fues, in Tubingen, published, in 1827, a cheap *Bibliotheca Patrum Latinorum*, edited by Protestant and Catholic theologians.

PATROCLUS, the friend of Achilles, was the son of Menœtius, one of the Argonauts, and of Sthenele or Philomela. He accidentally killed Clysonymus, the son of Amphidamus, in a game of dice at Opus. His father saved him by flight, and carried him to Peleus, by whom he was kindly received and educated as the companion of his son. He accompanied Achilles to Troy, and remained, like him, inactive, when the anger of Achilles prevented him from taking a part in the war. At length the necessity of action seemed so urgent that Achilles permitted Patroclus to go to the war, arrayed in his own armour. His success was at first brilliant; but, Apollo having deceived him, and rendered him defenceless, he was slain by Hector. The Greeks recovered his body, which they interred with the highest marks of honour, and established solemn funeral games to his memory. Achilles then resolved to avenge his friend, and to accompany him in death.

PATROL, in war; a round or march made by the guards, or watch, in the night time, to observe what passes in the streets, and to secure the peace and tranquillity of a city or camp. The patrol generally consists of a body of five or six men, detached from a body on guard, and commanded by a sergeant.

PATRON; in general, a protector. The Latin *patronus* signified, in the Roman republic, a patrician, who had plebeians, called *clients*, under his immediate protection, and whose interests he supported by his authority and influence. (See *Patricians*.) *Jus patronatus* signifies, in the Roman law, the right which a master retains over a freed slave. When Rome had reduced many nations under her yoke, noble Romans were sometimes the patrons of whole cities and provinces, and such patronage even descended by inheritance in some families. Thus the patronage over the Lacedæmonians was vested in the family of the Claudii; that of the Sicilians in the family of the Marcelli—an arrangement which, in so crude a state of politics, was not without beneficial consequences. *Patron* was also the title of every advocate who represented the interest of another, his client (*patronus causarum*). Patron, in the canon or common law, denotes a person who founds or endows a church or benefice, and reserves to himself the right of patronage, i. e. the right of disposing of it. (See *Advowson*.) The right of patronage was introduced among Christians towards the close of the fourth century, with the view of encouraging the opulent to erect churches, by giving them the privilege of appointing the ministers to officiate in them.

Lay patronage is a right attached to a person either as founder or as heir of the founder, or as possessor of the see to which the patronage is annexed.

Ecclesiastical patronage is that which a person is entitled to by virtue of some benefice which he holds. For the patronage connected with the Church of Scotland, which has been the cause of much dispute and disunion, see the article *Scotland*, subdivision *Church*.

PATUCKET. See *Pawtucket*.

PAUL, an apostle, was born of Jewish parents, at Tarsus, in Cilicia, and inherited the rights of a Roman citizen. He received a learned education, and early went to Jerusalem, to study under Gamaliel, one of the most celebrated Jewish Rabbins in the time of our Saviour, who instructed him in the Jewish laws and traditions. He was also well acquainted with the Greek poets and philosophers, as his Epistles show, and learned a trade (probably that of a maker of tents and hangings), according to the custom of the Jewish teachers, by which he afterwards supported himself in his travels. Thus prepared for the office of teacher, he joined, a few years after the death of Jesus, the sect of the Pharisees, and became a persecutor of the Christians; to crush whom the sanhedrim employed him, both in and out of Jerusalem. The Acts of the Apostles contains several instances of the heat of his zeal in this cruel work, upon which he entered from his attachment to the law of his fathers. He was even on his way to Damascus, with full power from the chief priests to arrest the Christians, when he was led, by a miracle (*Acts* ix. and xxii.), to view Christianity in a different light, and to seek a personal knowledge of the excellence of the religion from the instructions of Christian teachers. This sudden conversion, effected by the divine interposition, was indicated by the change of his name from *Saul* to *Paul*, and he engaged in the work of an apostle with an ardour that overcame every difficulty. Arabia, Syria, Asia Minor, Greece, and the islands of the Mediterranean, were the scenes of his unwearied activity in promulgating the doctrines of Christianity. In all his journeys he laboured to establish new churches, and to confirm the faith of those already existing. He made himself useful to the churches of Antioch, Ephesus, and Jerusalem, by instructing them, by arranging their ceremonies, and collecting alms for the poorer members. The churches of Philippi, in Macedonia, of Corinth, Galatia, and Thessalonica, honoured him as their founder; and the Epistles in the New Testament, which he wrote to these churches, and to the churches in the chief cities of Greece and Asia Minor, and to Rome, show the paternal relation in which he stood to them, and the paternal care which he exercised over them. By admitting the Gentiles to a participation in the blessings of Christianity, without requiring them to submit to the Jewish rites, he promoted the progress of Christianity far more than the other apostles, who at first baptized none but their own countrymen. But this conduct exposed him to the hatred of the Jews, who persecuted him as an apostate; and every thing at Jerusalem was prepared for his destruction. In the sixtieth year of the Christian era, after labouring with unwearied zeal, for more than twenty years, to spread the doctrines of Jesus, he boldly went to Jerusalem with the money which he had collected for the support of the oppressed Christians in Palestine. He was there arrested, and brought to Cæsarea, where he was kept a prisoner for two years by the Roman governors, Festus and Felix. The fearless spirit with which he explained his whole conduct excited the same admiration which had been produced in the Areopagus and among the wise men of Athens, (where Dionysius the Areopagite, became one of his adherents), by his enthusiastic eloquence. Having been illegally imprisoned, he appealed, as a Roman citizen, to the emperor, and was sent to Rome. He was shipwrecked at Malta (see *Melita*), and in the spring of the year 62, arrived at the capital of the world. He was treated with respect, but as a prisoner of state, and gained over many distinguished Romans to the Christian faith. It is certain that he was set free in the year 64; but the account of his farther travels in Spain, Britain, Macedonia, Greece, and the borders of Asia, is founded solely on conjecture. In the year 66, Paul returned to Rome, was again arrested, and died the death of a martyr. The history of no apostle is so rich in remarkable events, hardships, and sufferings, as that of this great man. Even the enemies of the religion for which he lived and died, could not deny the gifts of his mind, his deep and extensive knowledge, profound understanding of the nature of religion, richness and acuteness of thought, and a talent for teaching, which combined elegance, perspicuity, and fervour.

PAULA, Francis de. See *Francis de Paula*.

PAUL de Loanda, St. See *Loanda*.

PAUL I., emperor of Russia, son of Peter III. and Catharine II., was born in 1754. His father, on account of his dislike of Catharine, would not acknowledge his legitimacy; but on the death of Ivan (q. v.), in 1763, he became the sole remaining heir to the crown, and was placed under the care of count Panin and Æpinus. His mother treated him with great rigour, and kept him constantly estranged from public affairs during her life. In 1773, he married a princess of Hesse-Darmstadt, who died soon after, and, in 1776, he married a princess of Wurtemberg, who became the mother of the late emperor Alexander (q. v.), the late prince Constantine, the emperor Nicholas, and the grand-prince Michael, and several daughters, among whom is Anna, wife of the present prince of Orange. In 1780, he travelled, with his wife, under the title of *count of the North*, in Poland, Germany, Italy, France, and Holland, and after his return retired to his usual place of residence, the palace of Gatschina, and was permitted to take part neither in civil nor military affairs. On the death of Catharine in 1796, the prince was finally released from his long restraint; and the first acts of his government, after performing the obsequies of his mother, and paying the last honours to his father, were dictated by benevolent intentions. He put an end to the war with Persia, and liberated the Poles who were in confinement in Russia. But the severe treatment to which he had been subjected for forty years, had exercised a most injurious influence upon his character, and, combined with the natural violence and impetuosity of his temper, led to those acts of despotism and folly which stain his reign. He joined the coalition of crowns against France, and sent 100,000 men, partly under Suwaroff and Korsakoff, to Italy and Switzerland, and partly to Holland. The Russian arms were at first successful; but, after the defeat at Zurich (see *Masséna*), his increasing distrust of the British and Austrian courts, and the artful management of general Bonaparte, who dismissed the Russian prisoners, newly clothed and armed, and insinuated new suspicions into the mind of the czar, broke off his connexion with the coalition. Louis XVIII., who had been received into the Russian territory with every mark of attention, and the French emigrants, were ordered to quit the country. Paul had caused himself to be declared grand-master of the knights of Malta (1798), after the resignation of that dignity by the baron Hompesch; but, Britain having conquered the island in 1800, refused to surrender it to the Russian emperor. Paul therefore laid an embargo on all British ships in the Russian ports, and prevailed upon the Swedish, Danish, and Prussian courts to enter into a convention for the protection of their commerce against the encroachments of the British by sea. His internal administration was characterized by similar traits of impetuosity, and, in many cases, of tyranny. His innovations in the army, (particularly the introduction of hair-powder and queues); his prohibition against the wearing of round hats, pantaloons, &c.; his order obliging all persons who met him in the streets to leave their carriage and prostrate themselves before him; and other acts of a similar nature, excited general discontent. Other measures, of a more serious character, finally produced a conspiracy among the nobles. They excited mutual suspicions between Paul and his sons, and Alexander finally consented to assume the government, until the mind and health of his father were restored. (See *Alexander*.) The conspirators entered the antechamber of the emperor in St Michael's palace, at 11 o'clock at night (March 11, 1801), by a secret passage, and the door to the emperor's chamber was opened by the guard, who was deceived by an alarm of fire. An act was then read to him, by which he was to acknowledge himself incapable of conducting the government, and surrender it to Alexander. Paul cried out, "I am emperor, and will remain so;" and he was then despatched by the conspirators. Some accounts say that he was strangled in his bed with his own sash. In the Russian manifesto on the subject, his death was ascribed to apoplexy. See Chateaugiron's *Notice sur la Mort de Paul*, and Carr's *Northern Summer*.

PAUL OF VENICE, father, a celebrated ecclesiastic and historian of the sixteenth century, whose proper name was Pietro Sarpi, was born at Venice, August 14, 1552, and was the son of a merchant of that city. He entered young into the religious order of the Servites, in his twentieth year was appointed chaplain to the grand-duke of Mantua, and lecturer on the canon law. After two years, he returned to Venice, and became provincial of his order. He was afterwards made procurator-general of the Servites. A treacherous correspondent having betrayed a letter of father Paul, in which he had observed, that so far from coveting the dignities of the court of Rome, he held them in abomination, brought on him the imputation of being a heretic, while his liberal intercourse with eminent Protestants contributed to increase the prejudices thus excited. In a dispute between the pope and the Venetian government on the subject of ecclesiastical immunities, father Paul showed himself a strenuous advocate for the cause of liberty, and was summoned to Rome, on pain of excommunication, to answer for his conduct; but the affair was compromised. To the vengeance of his political enemies may be attributed an attempt to assassinate him in 1607; on which occasion he received many dangerous wounds from a band of ruffians. Father Paul employed the latter part of his life in writing the history of the council of Trent, in which he has developed the intrigues connected with the transactions of that famous assembly, with a degree of boldness and veracity, which renders the work one of the most interesting and important productions of the class to which it belongs. The labours of father Paul extended to various branches of knowledge; he was deeply skilled in the canon law, and distinguished for his acquaintance with anatomy. He appears to have discovered the valves of the veins which contribute to facilitate the circulation of the blood. He died January 14, 1622, and is said to have expired after uttering the words *Esto perpetua*, which have been construed as a prayer for the prosperity of Venice. The history of the council of Trent was first published in London in 1619, having been transmitted to this country through the medium of the British resident at Venice, Sir Henry Wotton, a personal friend of the author. The works of father Paul were printed at Verona, 1761 (8 vols. 4to), and at Naples, 1790 (24 vols. 8vo).

PAUL THE DEACON, or PAULUS DIACONUS, also called Warnifridus, and Paulus Monachus, was born at Friuli, in the eighth century, and was educated in the court of the Lombard kings at Pavia. On the capture of Desiderius, the last king of the Lombards, by Charlemagne, he retired to the monastery of Monte-Casino, where he took the habit. He wrote a history of the Lombards; and as he was an eye-witness of many of the events he mentions, his statements are held to be generally correct. It is contained in Muratori's *Rerum Italic. Scriptores.*

PAUL, St, Vincent de, the founder of the priests of the mission, was born in France, in 1576, studied at Toulouse, and having been captured by the Turks, remained a considerable time in slavery, during which he converted his master. On his return to France, he became parish priest at Clichy, and, by the aid of a rich and pious lady, founded a congregation of missions, the members of which were devoted to preaching to the poor, and performing other acts of benevolence and mercy. Their chief seat was the religious house of St Lazarus, at Paris, whence they were called *Lazarites.* Vincent de Paul died in 1660, and was canonized in 1737.

PAUL, Churches of St. The name of St Paul belongs to two celebrated churches, one in Rome, the other in London. The former, which stood without the walls of the city, was burnt July 15, 1823; and the latter, Wren's celebrated work, occupies the place of the beautiful Gothic cathedral (consumed in the great conflagration of 1666, which Dugdale and Hollar have described). The church at Rome, in an unhealthy situation, upon the road to Ostia, a league from the city, was one of the four Basilicæ of Rome, and one of the most important remains of ancient Christian architecture. The first church on this spot to said to have been erected by Constantine, at the request of pope Silvester, upon the place where the apostle Paul was buried. The emperor Theodosius is said to have rebuilt it upon a much extended plan (the cause of the destruction of the first edifice is not mentioned), and following popes completed and adorned it. Even the mosaics upon the outside, the work of Grecian artists, betrayed their early origin: the interior ornaments were probably likewise the work of Greeks, who had fled from the iconoclasts, and taken refuge at Rome. The multitude of magnificent marble pillars, in the interior of the church; the numerous paintings upon the walls; the mosaics upon the principal arch of the central nave; the rafters left visible, made, as report says, of cedar of Lebanon; the floor, composed of various kinds of marble, important to the archæologist on account of the inscriptions found upon it; the great dimensions of the edifice, and a door of 1070 pounds weight, cast at Constantinople,—gave the church a very distinguished place among the public edifices at Rome. The series of likenesses of the popes, 253 in number, which surrounded the interior wall of the principal nave, was particularly valuable. All this was consumed in one night by a fire occasioned by the carelessness of a workman who was repairing the roof. The marble pillars were partially calcined and so far injured, that very few of them could be again used in building. The work of Nicola del Nicolai, *Della Basilica di S. Paoli* (Rome, 1815, fol.), gives the most accurate description of this building.

St Paul's Cathedral, in London, upon an eminence to the north of the Thames. After several attempts to repair the old Gothic cathedral on the same spot (burnt in 1666), every trace of it was removed, and a new foundation laid for the present church. The first stone was laid June 21, 1675. In ten years, the walls of the choir and of the side aisles were completed, together with the circular porticoes on the north and south sides. The last and highest stone of the building was placed upon the summit of the lantern in 1710, and soon after the queen and the two houses of parliament attended service in the church. The whole building was completed in thirty-five successive years, under one architect, Sir Christopher Wren, one master-mason, Thomas Strong, and one bishop of London, doctor Henry Compton. The building is of Portland stone, in the form of a cross. Two rows of massy pillars divide the interior into a nave and side aisles. The west front towards Ludgate street is very noble. The elevated portico forming the grand entrance consists of twelve Corinthian columns, with an upper portico of eight pillars of the Composite order, supporting a triangular pediment. The entablature represents, in relief, the conversion of St Paul, a work of Francis Bird. Two turrets adorn the north-western and south-western angles of the cathedral. Upon the south front, which corresponds with the north, is a phœnix rising from the flames, with the motto *Resurgam* (I shall rise again). The dome is one of the most remarkable points of sight in the view of London. But the interior decoration of this building does not correspond with its exterior magnificence. The pavement is composed of slabs of black and white marble, joined in the manner of a large chess-board, increasing thereby the feeling of vacancy which these vast unornamented walls excite. Captured flags are hung in various parts of the dome and nave. The most favourable view of the interior is from the whispering gallery, in the lower part of the dome. Sir James Thornhill's paintings, illustrative of the most remarkable occurrences in the life of Paul, can be seen to most advantage from this situation. The great bell is tolled only on the death of some member of the royal family, of the lord-mayor, of the bishop of London, and of the dean of the cathedral. You reach the ball by 616 steps. To break the uniformity of the interior, it was suggested, in 1790, to erect in the interior, monuments and statues to the illustrious dead. The first was in memory of John Howard (1796). The monument of Nelson, who is buried in a tomb in the middle of the building, is the work of Flaxman. There are monuments also to Sir W. Jones, Earl Howe, Sir Joshua Reynolds and others. Over the entrance to the choir, is a marble slab, with this inscription in Latin: "Here reposes Christopher Wren, the builder of this church and city, who lived for more than 90 years, not for his own, but for the public good. Reader, dost thou seek his monument, look around thee." (See *Wren.*) The cost of this building was about £1,500,000. J. Gwilt has written a history of St Paul's. In the Illustrations of the public Buildings of London (with historical notices and descriptions of each building), by the architects J. Britton and A. Pugin, we find, in No. I. (London, 1823), St Paul's church represented and described.

PAUL VERONESE. See *Cagliari.*

PAULETTE. The hereditary succession and venality of almost all the offices in the judicial and financial departments was an abuse deeply interwoven with the whole administration of ancient France, and a source of the most dreadful disorders. In the early period of the monarchy offices were held only at the pleasure of the king; the consequence was, that on the death of the monarch, all the commissions on which the offices of state depended expired. Hence it was necessary for a confirmation from the new king to be obtained, and this rule was regularly observed, particularly from the time of Henry II.; nevertheless, the maxim still remained in force, which Louis XI. had pronounced in an ordinance of 1467, that no officer should be discharged but on his own voluntary resignation, or upon judgment had against him. It is uncertain whether Louis XI. was the first who made offices in the judicial and financial departments venal; but it is well known that Louis XII. adopted this method to defray the expenses of his campaign in Italy. Francis I. gave a new character to the offices of the tax-gatherers by selling them, so that the purchase-money might be regarded as a kind of security; and, under Henry II., this venality was extended also to judicial stations. Instead of the former high offices, in which a single man, as *grand bailli*, *sénéchal*, &c., had administered all branches of public power, judicial tribunals were erected with a collegial constitution (*sièges présidiaux*), in which the dignity of president and counsellor was to be bought with money. Under the succeeding reigns of Francis II., Charles IX., and Henry III., this arrangement was continued, although both the estates of the kingdom and the parliaments were strongly opposed to it. The universal venality of office was legally confirmed by an ordinance of 1597, which permitted all officers to resign their places in favour of a third—a thing which had often been done, though never before authorized by law. To put an end to the urgent requests for reversions, the secretary, Charles Paulet, in 1604, devised the plan of granting liberty to all who should pay a yearly tax of one sixtieth, or one and two thirds per cent., of the income of their offices (properly called *annuel*, but from its inventor, *Paulette*), to transmit their offices to their heirs, who might either hold them or sell them again. Under the succeeding reign, the abuse of this venality of office became gross. If the government wanted money, a number of new offices were created, and a regular salary from the treasury affixed to them, which was to be viewed as the interest of the purchase money. To hold out further inducements to purchasers, other incomes, such as fees and the like, were added, which generally amounted to much more, and necessarily increased the oppressive taxes of the people. Hence the current price of such offices, partly on account of the fees in addition to the salary, and partly on account of the consequent influence and honour, was much higher than the sum paid for them to the public treasury. This system had, moreover, other disadvantages, besides the oppression of the people. It closed the entrance to offices of state against all who had no recommendation but merit. It augmented the number of state-servants beyond all proportion; it brought high stations into the hands of ignorant and faithless men, and drew away from agriculture and trade the capital necessary for their prosperity. It led, finally, to the undermining of the municipal constitutions, which happened near the end of the reign of Louis XIV.; for when no more public offices could be established, those of the towns were arbitrarily seized, which had formerly been filled by the vote of all the freemen. In vain did the more worthy ministers strive to cure the daily increasing evil; necessity constantly dragged them back to the old system. In 1664, according to an estimate made by Colbert, and communicated to the government by Forbonnais—*Recherches sur les Finances de France* (An Inquiry into the State of the Finances of France)—it appeared that there were 45,780 venal offices in the judicial and financial departments, the duties of which might be as easily performed by 6000. The salaries attached to them, and paid out of the public treasury, were estimated at over 8,000,000 livres, for which the king received an *annuel* of only 2,000,000. The whole amount of the drain which they occasioned on the people was estimated at 187¼ millions, and the current price of the offices at near 420 millions. Colbert undertook to diminish the number of offices, but the wars and extravagance of Louis XIV. compelled his successor to resort to the same means for procuring money. From 1689 to 1695, 294 millions were thus collected, and from 1701 to 1709, 426 millions. Some attempts were afterwards made to diminish the evil, but, with all its deleterious effects, it continued till the revolution.

PAULICIANS. In the chains of the Caucasus and Taurus, which unite in Armenia, a few of the ancient Manichæans and Gnostics were remaining in the eighth century, who assumed the name of *Paulicians*, from Paul, their leader, to save themselves from the persecutions to which the Manichæans were always exposed. As iconoclasts, they were favoured or persecuted by the Greek emperors, according as the latter were favourable or otherwise to the worship of images, which the Manichæans totally rejected. When their Manichæism was discovered, in the ninth century, they were subjected to violent persecution. Many of them were put to death; others fled to Mohammedan countries, and assisted them in their wars against the Greeks. In the tenth century, the attempts at the conversion of some Paulicians who returned and were fixed in Thrace by John Zimisces, the Greek emperor, were as unsuccessful as the persecutions had been. When the crusades had opened a way to the middle of Europe, different companies of this sect passed into Bulgaria by land, and others into Italy and Spain, by water. Their successors have since appeared in various parts of Europe, under different names. Of Paulician origin was the doctrine of those devotees resembling the Messalians, who were called *Bogomiles*, on account of their constant use of the expression *Bogmilui* (in Bulgarian, God have mercy on you). In the fifteenth century, many of them were burned at the stake in Constantinople. For the doctrines of the Paulicians, see *Manichæans*.

PAULINE; princess Borghese, sister to Napoleon. See *Bonaparte*.

PAULINIANS, or PAULANI. See *Minim Friars*.

PAUPER COLONIES. See *Colonies, Pauper*.

PAUPERISM. "It has been computed," says doctor Franklin, "by some political arithmeticians, that, if every man and woman would work four hours each day in something useful, that labour would produce sufficient to procure all the necessaries and comforts of life; want and misery would be banished from the world, and the rest of the twenty-four hours would be leisure and pleasure." When we estimate what a man will do in four hours, we necessarily suppose a certain rate of production; and this rate is greater or less according to the strength, skill, industry, and implements of the workman. The doctor's political arithmetician, however, probably supposes the ordinary rate of productiveness. In regard to consumption, the disproportion between men is still greater. Compare the costly collection of materials employed for the support of the inmate of a palace and the scanty supplies of the inmate of a hut. The estimate, therefore, must suppose an average rate of consumption, as well as of production. Perhaps, thus understood, it is true. We may go a step further, and safely say, that the products of labour in every civilized community, at the present actual degree of skill and industry, are sufficient to supply a competence to all. What, then, hinders all the world from enjoying competence, happiness, and content, as far as provisions and accommodations for living are concerned? Two great obstacles, viz. the one, that labour is not equally shared by all; the other, that the labour of all is not equally well rewarded. These two causes always have prevented that universal competence which philanthropists desire, and to promote which, in some degree, is the great object of their labours. They aim to enable as many persons as possible to command the means of support upon those terms which the prevailing laws, habits, and customs of society impose. In every society, the means of living of different descriptions are estimated, by general consent, at certain rates; whatever a man can do towards supplying his own, or the general consumption, and whatever is comprehended in the mass of this consumption, is estimated at a certain value or rate. The object of the laws is to protect each one in the possession of his part of the general stock, and to save him from the necessity of parting with it without receiving an equivalent. To enable every one to command a competence, the main requisites are, to enable him to exchange his *labour* for the things which he needs, and to make him willing to labour for the means of support. One great purpose of a large part of the social institutions, including the public schools, and the institutions for moral and religious instruction, is to make him willing and able to earn his living. The laws, moreover, often make provision, and the sentiments of a well-ordered community universally prescribe, that young men should be educated to some employment. In the very elaborate examinations which took place in England, in 1816, under the direction of a committee of the house of commons, on the subject of pauperism and crimes, all the facts disclosed, and opinions expressed, tended to show that the amount of poverty and crime depended almost wholly on the character and habits acquired by the young. No advantages of climate, soil, and situation, will secure a people from the evils of pauperism, and its consequence, crime. Some of the most salubrious and fruitful countries abound in both. Scotland has few paupers compared with Ireland, which is more fruitful and more easily cultivated. The causes of pauperism lie in the character of the population, and the only preventive is the improvement of the people. The pauperism of England is to be attributed, in a great measure, to the reckless and improvident habits of its labouring poor. But the greatest prudence, united with the greatest industry on the part of the poorer classes, will not always save them from want. This is frequently the case in England, where wages are low compared with the expenses of living, so that an ordinary labourer often cannot, in the period of his life when he can do the greatest amount of labour, save any thing against the time of decrepitude or sickness; and the children of suffering parents must suffer with them. The question in regard to such is, By what means shall their present distress be relieved? The economists of the *new school* (as it is sometimes called), namely, that of Mr Malthus, Mr Ricardo, Mr M'Culloch, and others, say that they are to be abandoned to starvation. But a doctrine so abhorrent to our nature is only a hideous theory, which cannot enter into the laws or habits of any people, until human nature shall be sunk into brutal hard-heartedness. The dictates of religion, conscience, and compassion, enjoin upon us to give relief; and the only question practically discussed relate to the mode and degree of the assistance to be afforded, and the measures which ought to be adopted for reclaiming such as bring their misery upon themselves by vice and idleness. The two great objects are—remedy of present suffering and prevention of future; and these two objects are very much blended, for it is a great rule so to administer succour as not to encourage idleness or vice. In the case of young subjects of relief, the greatest charity is that which is directed to the forming of good habits, and giving them instruction in useful arts. With older subjects there is very little hope of any great amelioration of character. But even with these, a regard to the influence upon their habits is constantly to be kept in view in administering to their present wants. One essential condition is, that they should be made to labour, and thus contribute, as far as possible, to their own support. How to employ them to advantage, is a very important inquiry, and no general rule can be prescribed. In some districts, they may be best employed in working on a large farm. Another method is, to let out their services to persons who will contract for their support. This mode should be practised with caution, and with proper provision for the humane treatment of the labourers. As to the sick and infirm, the rest of the community are bound to support them, by a just assessment of the expenses. Charity should be so administered to the poor as not to make it preferable to the gaining a subsistence by individual efforts.

PAUSANIAS; a Greek topographical writer, who flourished during the reigns of Adrian and the Antonines. If he is the rhetorician or grammarian who is mentioned under this name, he was a native of Cæsarea, in Cappadocia, and studied under the celebrated Herodes Atticus. He taught at Athens, and afterwards at Rome, where he died. His account of Greece, a kind of journal of his travels, in which he describes every thing remarkable—temples, theatres, tombs, statues, pictures, monuments of every sort, &c.—is a valuable work for the antiquarian. His style is sometimes careless, and sometimes affectedly formed on more ancient writers; and the work is full of fables which are connected with the objects that he describes. For this reason, Scaliger called him *Græculorum omnium mendacissimus;* but the fullest confidence may be put in Pausanias, where he speaks as an eye-witness. His work has been edited by Kuhn (Leipsic, 1696, folio), Facius (Leipsic, 1794—1797, 4to), Sibelis (Leipsic, 1822, 4 vols.): the latest edition is that of Bekker (Berlin, 1826). The French translation by Clavier and others (Paris, 1814—1821) contains the Greek text and notes, in seven volumes. We have an English translation by Taylor.

PAUSANIAS; a Lacedæmonian general, son of Cleombrotus, and nephew of Leonidas. He was appointed guardian of his cousin Plistarchus, the son of Leonidas, during his minority; and in this capacity, was at the head of the government during the absence of the other king. When Mardonius invaded Greece with a large army of Persians, Pausanias marched against him as general of the allied forces of Greece, deceived his enemy by a feigned retreat, and totally defeated him in the battle of Platæa (B. C. 479). He then advanced to Thebes, which had deserted the cause of Greece, compelled the inhabitants to surrender the leaders of the Persian party, and caused them to be executed. His moderation, which had been admired during the campaign against Mardonius, now gave way to arrogance and overbearing impetuosity. To himself alone he ascribed the victory at Platæa, and offered a golden tripod in the temple of Apollo at Delphi, with an inscription representing himself as the sole conqueror. He became still more insupportable, after having, at the head of the allied Greek fleet, delivered the Grecian cities, and, after a long struggle, Cyprus also, and, finally, Byzantium itself, the key of Asia Minor, from the Persian yoke. While Aristides and Cimon, who commanded under him, won the hearts of all by their affability, Pausanias abused the allies, and considered the Spartans as the ruling nation among the Greeks. At length, he entered into secret negotiations with Xerxes, and conceived the design of making himself master of Greece. He restored to Xerxes, without ransom, many distinguished Persians, who had been taken prisoners at Byzantium, openly renounced the manners and customs of the Spartans, adopting Persian habits and the Persian costume, and carried things so far, that the disgust of the allies could no longer be suppressed. The Spartans summoned him home; but hardly was he acquitted in consideration of his rank and services, when he betook himself again to Byzantium, under the pretence of taking part in the campaign. Being compelled by the Athenians to leave the city, he went to Colonæ, in Troas, and entered into fresh negotiations with the enemies of Greece. He was once more recalled and imprisoned; but, notwithstanding the charges against him, was again liberated, under promise to appear whenever he should be summoned. But he entered into new negotiations with the Persian king. To secure himself against detection, he had obtained from Artabazus a promise to put to death the bearers of his letters. The suspicions of one Argilius, whom he sent on this errand, being awakened, he opened the letter intrusted to him, found his suspicions confirmed, and gave information of the fact to the ephori. In order to procure full proof, they directed Argilius to take refuge in the temple of Neptune, at Tænarus, as if fearing for his life. As soon as Pausanias heard of the circumstance, he hastened to meet him. They entered into a conversation, which disclosed to the ephori, who were concealed in the place, the guilt of Pausanias. The ephori now returned to Sparta, determined to punish him according to the rigour of the law. Pausanias, having been informed, on the way, of the fate which awaited him, took refuge at the feet of Minerva Chalciœcus. But his indignant mother brought the first stone to close the entrance of the temple. The people followed her example, and the unhappy prisoner, being thus walled up, died of hunger. He was buried before the temple, and the anger of the goddess was appeased by the erection of two bronze statues.

PAUSILIPPO; a hill near Naples, with a large and beautiful grotto (*la grotta di Pausilippo*). This is a straight passage cut through the rock, from Naples to Puzzuoli, eighty or ninety feet high, from twenty four to thirty wide, and about 1000 paces long. Through the deep night of this grotto, which is high and wide, but inaccessible to the rays of the sun, passes the daily travel of a very populous district. A powerful echo from the roof increases the rumbling noise of the passage. This cavern, of which so many fables were related in the time of Strabo, was probably hewn out before the time of the Romans, at first only as a quarry, but afterwards continued through the hill. Alfonso I. (1442—1458) enlarged it. It was subsequently made broader and higher, paved, and provided with air-holes. The whole rock is firm, and has never been shaken by earthquakes. In the centre, there is a chapel of the Virgin Mary; over the grotto, are the remains of an aqueduct and of what is called *Virgil's tomb*. Since 1822, the Austrian troops have constructed a road over the Pausilippo to Puzzuoli, by which the passage through the grotto is avoided. In the course of this work, a grotto was found at the summit of the Pausilippo, which is probably the *crypta Pausilypona* of the ancients, the name which is now given to what Seneca called the *crypta Neapolitana*.

PAUW, Cornelius de, canon at Xanten, in Cleves, was born at Amsterdam in 1739, and died in 1799. He was a writer of much learning and ingenuity, but led away by a love of theory and unfounded speculations. His *Recherches philosophiques sur les Grecs, sur les Americains*, and *sur les Egyptiens et les Chinois*, were published together in seven vols., 8vo, at Paris, in 1785.

PAVEMENT OF THE STREETS. If this important invention is not of recent date, its general use is comparatively recent. No large European city, Rome only excepted, had paved streets till towards the twelfth or thirteenth century. More mention is made in the ancient authors of paved highways than streets, which Beckmann, in his History of Inventions, ascribes, however, to the simple circumstance that the latter were probably paved by the citizens, each taking the part before his own his house, so that the government was not required to make provision for this purpose. Isiodore says that the Carthaginians were the first people who had paved streets, which were soon imitated by the Romans; but long before that time Semiramis paved highways, as her own vain-glorious inscription, preserved by Strabo, asserts. At Thebes the streets were under the care of telearchs, who provided for repairing and cleaning them. Epaminondas's being appointed to the office rendered it honourable and sought for, whilst before it had been contemned, and for that very reason given to that great general. Jerusalem seems not to have been paved in the times of Agrippa, according to Josephus. When Rome was first paved is not exactly ascertained, though many antiquarians consider it to have been in the year of the city 578, according to a passage of Livy, which admits, however, of several explanations. The ediles at first had the superintendence of the streets; at a later period particular officers called *curatores viarum*. Pavements of lava, with elevated side walks, are found at Herculaneum and Pompeii. Of modern cities, Paris is generally mentioned as having the oldest pavement; but it is certain that Cordova, in Spain, was paved about 850 A. D. by Abderrahman II., who also brought water to the city in leaden pipes. Paris was not paved in the twelfth century, for Rigord, physician and historian of Philip II., tells us that the king, standing at his window, and disgusted with the dust and dirt thrown up by the vehicles, resolved to pave the street, for which orders were issued in 1184; and this is confirmed by several historians. It is certain that many streets of Paris were not paved even in 1641. All historians allow that London was not paved at the end of the eleventh century. It is not certain when it was first paved; probably the paving took place by degrees. Holborn was first paved in 1417, the great Smithfield market not until 1614.

The first pavement of modern cities was generally, though not always, very bad, as it is even now, in the generality of small places, as the traveller can testify who has been jolted through the small towns of the European continent. That the Romans knew what good pavement was, is proved by the still existing *via triumphalis*, beautifully paved with basalt. Of late, pavements have been much improved; stones have been squared so as better to fit each other, or the streets have been macadamized. In Germany, where coaches often enter the large gateways of the houses, and on stone pavement shake the whole building, paving with square wooden blocks, cut from the knotty parts of a tree, and presenting the ends of the grain uppermost, has been adopted with great success. Lately iron pavement has been proposed in London: oyster shells have been tried as pavement in New Orleans. For more information, see Beckmann's *History of Inventions*.

PAVIA, (anciently *Ticinum*) in the Lombardo-Venetian kingdom, lies in the Tesino, near its confluence with the Po; lat. 45° 10′ N.; lon. 9° 9′ E.; population 21,250. The most remarkable buildings are the palaces Mezzabarba, Bellisomi, and Botta, and the new cathedral. The university is said to have been instituted by Charlemagne. In 1770, it received a new organization, and in 1817 was revived, with its thirteen colleges. It has about 800 students, an observatory, anatomical theatre, &c. The citadel is built in the old style. Pavia was at one time the residence of the kings of Lombardy. In 1525, Francis I. was made prisoner by the emperor Charles V. at the battle of Pavia. The Carthusian monastery (*La Certosa*) here is the finest in Italy.

PAVILION, at Brighton, England; a building erected in 1784 for the then prince of Wales. It was a favourite residence of George IV., and its name sometimes occurs in connexion with important measures agitated there. See *Brighton*.

PAWN-HOUSES. See *Lombards*.

PAYS DE VAUD, WAADTLAND, or WAADT; one of the cantons of the Swiss confederacy which has the lake of Geneva on the S., France on the W., Neufchâtel on the N., and Friburg and Berne on the E.; square miles, 1181; population (1827), 178,880, of which 6000 were Germans and the rest French; Calvinists, 175,850. The capital is Lausanne. This canton is not only one of the largest and most populous of the confederacy, but according to Simond, is the one in which the advantages of education are most generally enjoyed. Crimes are of very rare occurrence. The legislative body consists of 180 members, nine of whom constitute the executive. Justice is administered by justices of the peace, district courts, and the supreme court at Lausanne. The soil is fertile and well cultivated; the most important productions are orchard fruits and the wine grape; the Ryff wine and the *vin de la Côte* are celebrated.—The Vaud formerly belonged to the dukes of Savoy, from whom it was conquered by Berne. In 1803, it was acknowledged as an independent canton. In December, 1830, the popular voice demanded a revision of the constitution; a committee was accordingly formed for this purpose, but its dispositions did not meet the public views, and a general rising took place. Eight thousand petitioners, without arms, assembled at Lausanne, but, on receiving assurances of reform, dispersed without committing violence. See *Switzerland*.

PAZZI, one of the richest and most distinguished families in the Florentine republic, is celebrated for its connexion with the conspiracy of 1478, of which it became the victim. Jealousy of the power of the Medici combined with the jealousy of a disappointed lover to inflame Francis Pazzi, the author of the conspiracy, against Julian of Medici, his rival, who had privately married Camilla Cafarelli. Francis Pazzi, rash, haughty and vindictive, resolved to avenge this offence, and the humiliations of his family, by the destruction of the Medici. Bernard Bandini, who also hated the Medici, was his first confidant. Aware that the increasing power of the Medici was viewed with dislike by the pope, Sixtus IV., they acquainted his son, Jerome Riario, the friend of Pazzi, of their design of assassinating Lorenzo and his brother Julian of Medici, and introducing a new form of government, and wished through him to gain the assistance of the pope. The latter promised his aid, and Francis Salviati, archbishop of Pisa, the enemy of the Florentines and of Lorenzo de' Medici, also joined them. James Pazzi, uncle of Francis, and a peaceful and prudent citizen, was persuaded by Montesecco, the general of the pope, to take part in the conspiracy. While Charles Manfredi, count of Faenza, was sick, the conspirators, without exciting the suspicion of the Medici, collected a number of troops for their defence. They resolved to murder both the Medici at a festival. Their project was twice frustrated by the absence of Julian; and the 26th of April, 1478, the day in which religious service was to be celebrated in the church of Santa Reparata, was next fixed upon for the execution of their designs. The sound of the bell, at the moment the priest raised the host, was to be the signal; but as the time approached, Montesecco refused to pollute the sacred place. The work was now committed to Anthony of Volterra and Stephen, a priest, two weak men. Lorenzo and a large number of people were already assembled in the church, but Julian was not present. Francis Pazzi and Bandini went and persuaded him to attend the mass. On the way to the church they conversed with him in the most friendly manner, and Francis Pazzi several times embraced him, in order to ascertain that he was not clothed in armour. When they arrived at the church, they placed him between themselves, and Anthony of Volterra and Stephen stationed themselves by the side of Lorenzo. At the second sound of the bell, Francis Pazzi stabbed Julian with such violence as to wound himself. Bandini murdered Nori, the friend of Julian. Anthony and Stephen attacked Lorenzo, but only gave him a slight wound in the neck. He escaped into the sacristy. Francis and Bandini, who undertook to pursue him, were prevented. Many persons lost their lives in the crowd, and it was with difficulty that the cardinal was defended by the priests from the popular fury. Bandini fled. Francis, after an unsuccessful attempt to rouse the people to insurrection, faint from loss of blood, was forced to return home. Salviati and James Poggio at the head of about 100 Perugians, had proceeded to the palace to take possession of it; but Cæsar Petrucci, the gonfalonier, suspecting their designs, summoned the guards, and occupied the upper story. The Perugians were accidentally shut up in a hall which could not be opened from within, and the Florentines easily seized the archbishop and many of the conspirators. Some of them were killed on the spot; others were hanged from the windows, and afterwards thrown into the streets. The enraged populace seized Francis Pazzi in his house, dragged him naked through the streets, and hanged him, with seventy others, at the windows of the palace. James Pazzi, who was riding through the streets calling the people to arms and liberty, was stoned from the palace of the *signoria*, and, finding no adherents, fled to the Apennines, where he was recognized by a peasant, carried back to Florence, and hanged with Renatus Pazzi. The people took his body from the family tomb, and threw it into the fields. The corpse was again buried, and again disinterred by the people, and thrown into the Arno. Bandini had fled to Constantinople; but he was surrendered by the sultan, Bajazet, and executed with Anthony of Volterra, and Stephen, who had fled to a monastery. Napoleon Francesi and William Pazzi, who was innocent, and was brother-in-law of Lorenzo, both escaped the rage of the populace. But notwithstanding the entreaties of his wife, Bianca, the latter was banished to his villa for life. The former disappeared, and was never more heard of. The rest of the family were imprisoned for life in the dungeons of Volterra. Montesecco was beheaded; and the cardinal was sent back by Lorenzo, with many apologies to Rome.

PE; a Chinese word, indicating *north*; for instance, *Pe-King* (northern residence).

PEA (*pisum sativum*). The native country of the pea is unknown, but it is commonly referred to the south of Europe. It has been cultivated from remote antiquity, and is now universally diffused, and forms one of the most valuable of culinary plants. It belongs to the natural family *leguminosæ*. The root is annual; the stem herbaceous, divided often from the base into several cylindrical weak branches, trailing upon the ground, unless support is afforded; the leaves are pinnate, provided at base with large stipules, and terminated with tendrils; the flowers are axillary, usually disposed in clusters upon a common peduncle, and of a whitish, or, sometimes, reddish or purple colour; they are succeeded by oblong and almost cylindrical pods. The varieties which have been produced by cultivation are very numerous, and differ in the colour of their flowers, their number, and that of the seeds, the time of ripening, and in stature, some being low plants of a few inches, and others attaining the height of ten or twelve feet. Some varieties have pods destitute of the coriaceous inner film, which admits of their being boiled entire, and served up in the same manner as kidney-beans. Peas are nutritious, and, especially when green, form an agreeable article of food to most persons. When ripe they are used for soup, and are prepared by freeing them from the husks, and splitting them in mills constructed for the purpose. They are sometimes ground into flour, which is mixed with that from wheat by bakers, but the bread is rendered heavy and unwholesome. With rye-flour, however, in the proportion of one fourth, they are said to afford a palatable and nourishing bread. Green peas are among the earliest products of the garden, and a succession may be kept up throughout the season by sowing at different periods of time. A second species, the *pisum maritimum*, grows wild on the sea-shore. It resembles in form the preceding, and has large reddish or purple flowers, disposed in racemes. The seeds are bitter and disagreeable, though it is said they have been collected for food in times of scarcity.

PEACE, Justice of the. See *Justice of the Peace*.

PEACE, Perpetual. St Pierre was the first who proposed a formal plan for perpetual peace, which Rousseau afterwards made known. The almost verbal coincidence of St Pierre's articles for his international league with the articles of the act of the Germanic confederation is very remarkable. (See *Henry IV*.) This subject has subsequently been brought forward by Kant, among others, in his treatise *Zum ewigen Frieden* (For Perpetual Peace). The general means proposed for producing perpetual peace were sometimes the balance of power, sometimes a universal monarchy, and sometimes a general international union, or league of states, adjusting all their disputes by amicable arbitration by means of a permanent congress, as the highest tribunal of the nations. But all these means are necessarily imperfect. The idea of promoting the cause of permanent peace by societies expressly organized for that purpose, was agitated in this country before the late war with England; but it was not till after the close of the war that the first peace society in the world was formed in New York, in August, 1815. In the subsequent year, a peace society was formed in London. In France, a society with similar views was formed in 1821, under the sanction of government, enumerating among its members men of high rank and character. The object of these societies is to effect the abolition of war by the diffusion of intelligence and knowledge; but their efforts, as yet, have been confined to the distribution of a few tracts.

PEACE, Religious (German, *Religions-friede*). There are two treaties of peace in German history bearing this name, both in the time of the reformation; one concluded July 22, 1532, and called the *religious peace of Nuremberg*; the other concluded September 26, 1555, and called the *religious peace of Augsburg*. By the first, the emperor Charles V. promised to convoke a great council to settle all religious differences, until which all hostilities should be suspended; and, if a council should not be convoked, a new compromise was to be made between the Protestants and Catholics. But, respecting the claims of the Protestants, particularly as to the free and public exercise of their religion, the imperial commissioners were unwilling to promise any thing definite. The Protestants placed themselves, by this peace, in a disadvantageous position. The second peace produced something like a settlement between the two religious parties, after a long period of war and suffering. Ferdinand declared, in the name of his brother the emperor, at Augsburg, that little good could be expected from a national council, and that it was much better to think of establishing peace in the empire without attempting to reconcile jarring religious opinions. Peace was finally concluded on the terms that no member of the empire should be attacked on account of his religion, but should be left in quiet possession of his land, subjects, property, mode of worship, &c.; religious disputes should be settled only by amicable means; people should be allowed to change their residence on account of religion, &c. Two points only furnished subjects of an obstinate dispute for six months. The Protestants demanded that the ecclesiastical members of the empire, the bishops, abbots, &c., should be at liberty to become Protestants, which the Catholics would agree to only on condition that every clergyman becoming a Protestant should, *ipso jure et facto*, lose his office and authority; but the Protestants demanded that the converted bishops should continue in authority over wealthy countries. The two parties could not agree, and the emperor at last decided, as was customary. This point is called the *reservatum ecclesiasticum*. The emperor decided that every bishop, prelate, &c., becoming Protestant, should lose his office and income, but without injury to his honour and dignity. The second point was, whether Protestants under Catholic governments should be allowed to enjoy the free exercise of their religion. Ferdinand decided that they should until a final religious compromise; and thus peace was concluded without the necessary basis, free exercise of religion. An opening was thus left for many bloody wars.

PEACE RIVER. See *Mackenzie's River*.

PEACH. This is, perhaps, the most exquisite of the fruits of temperate climates, and, if not eaten to excess, one of the most wholesome. The tree is of middling stature, but varies, in this respect, according to soil and climate. It belongs to the natural family *rosaceæ*. The leaves are alternate, simple, lanceolate, acute, and finely serrated. The flowers appear before the leaves, are very beautiful, and diffuse an agreeable odour. The fruit is a large downy drupe, containing a stone which is deeply furrowed and rough externally, which character distinguishes it from both the almond and apricot. The peach tree is known to botanists under the name of *amygdalus Persica*, or, more recently, *Persica vulgaris*, and is supposed to have been introduced into Europe from Persia. It was first introduced into England about the year 1562. The varieties are very numerous, differing in size, flavour, and time of ripening; but they are principally of two sorts—the *free-stones*, in which the flesh may be easily separated from the stone, and the *cling-stones*, in which it is adherent. The nectarine is by some considered a mere variety of the peach, differing only in its smooth skin; and this fruit is likewise divided into cling and free-stones. The peach is reproduced by planting the stones; but it is usual, when the stocks have attained a certain size, to graft upon them any required variety. Forty years are mentioned as the duration of the peach-tree. It is recommended, when the fruit approaches maturity, to strip off the surrounding leaves, in order that it may be fully exposed to the rays of the sun.

PEACOCK (*pavo*, Lin., &c.); bill naked at the base, convex above, thickened, bent down towards the tip; nostrils open; cheeks partially denuded; feathers of the rump elongated, broad, capable of being expanded like a fan, and ocellated; tail wedge-shaped, consisting of eighteen feathers; feet furnished with four toes; the tarsi with a conical spur; the head crested.

P. cristatus, Lin., &c.; *crested*, or *common peacock*. To recite the numerous details of the markings of this splendid bird would require a long description, which, after all, would convey but a faint idea of the original. There are, however, few of our readers who are not sufficiently familiar with the rich attire of the living specimen to dispense with a minute enumeration of its changeable hues. Like other domesticated birds, it exhibits several varieties. The ordinary length of the peacock, from the tip of the bill to that of the full-grown tail, is about four feet. The female is rather less; and her train is not only very short, but destitute of those beauties which ornament the male; her crest, too, is shorter, and her whole plumage partakes of a cinereous hue; her throat and neck are green, and the spots on the side of the head are larger than those of the male. The females of this species, however, like those of some other birds, have sometimes been known, when past breeding, to assume the male attire. In a state of nature, the pea-hen breeds once a year, and lays, it is alleged, from twenty-five to thirty eggs, of a whitish hue, speckled with dusky. In colder climates, and when domesticated, the number of eggs seldom exceeds five or six, and the hen sits from twenty-five to thirty days, according to the temperature of the country and season. When pleased or delighted, the cock erects his tail, unfolds his feathers, and frequently turns slowly round, as if to catch the sunbeams in every direction, accompanying this movement with a hollow murmuring. At other times, his cry is very disagreeable, and often repeated, especially before rain. Every year he sheds his plumes; and courts the most obscure retreats till the returning spring renews his lustre. The young acquire the perfect brilliancy of their plumage in their third year; but, in cold climates, they require attention in rearing, and should be fed on grass, meal, cheese, crumbs of bread, and insects, until they are six or seven months old, when they will eat wheat and various sorts of grain, like other gallinaceous birds; but the peacock is, in this respect, extremely capricious, and there is hardly any kind of food which it will not, at times, covet and pursue. According to Aristotle, it lives about twenty-five years; but Willoughby and others allege that it is capable of existing for near a century. When full grown, it is not readily injured by cold. Though long naturalized in Europe, it is of Eastern origin, occurring in the greatest profusion in the neighbourhood of the Ganges, and in the extensive plains of India, particularly in Guzerat, Cambay, the coast of Malabar, the kingdom of Siam, and the island of Java. As early as the days of Solomon, they were imported into Judea by the fleets which that monarch equipped on the Red sea. From India they were brought into Asia Minor, and subsequently into the isle of Samos, where they were formerly much multiplied, and consecrated to Juno, but from which they have now wholly disappeared. In Greece, they still brought a high price in the time of Pericles. They were introduced into Rome towards the decline of the republic; and the orator Hortensius was, according to Pliny, the first who had them presented at table, at a feast which he gave to the college of augurs. The emperors took a pride in collecting large dishes of the heads or brains of peacocks, which seem to have had nothing to recommend them but the enormous expense at which they were provided. In modern times, the young birds only are reckoned fit for the table. The Europeans have introduced them into Africa and America.

P. chinquis, Tem.; *pavo bicalcaratus*, and *pavo Thibetanus*, Lin.; *peacock pheasant*, *iris peacock*, *Thibet peacock*. These singular birds, which are rather larger than a pheasant, and highly elegant and beautiful, inhabit China and the mountains which separate Hindostan from Thibet. According to Sonnerat, they likewise occur in Malacca. The most remarkable circumstance in their natural history is that of the tarsi being armed with several spurs, which vary in number from two to six, and frequently the same bird has a different number on each leg. Another curious fact is that the tail is composed of two distinct ranges of long feathers, the undermost being the true tail. These feathers are capable of being erected, and displayed like a fan when the bird is agitated, but at other times they remain in a horizontal position. The plumage of the female is less brilliant than that of the male, and the tail shorter. In the natural state, this species is not very wild, and it readily becomes accustomed to confinement, and propagates with facility.

PEAK; a name given to the upper corner of those sails which are extended by a gaff, or by a yard which crosses the mast obliquely, as the mizzen-yard of a ship, the main-yard of a bylander, &c. The upper extremity of these yards and gaffs is also denominated the *peak*.

PEAK CAVERN, in Derbyshire. See *Cave*.

PEALE, CHARLES WILLSON, the founder of the Philadelphia museum, was born of English parents, at Chestertown, Maryland, in 1741; was apprenticed to a saddler at Annapolis, and married at an early age. He successively carried on the trades of saddler, harness-maker, silversmith, watchmaker, and carver; and afterwards, as a recreation from his sedentary practice of portrait-painting, became a sportsman, naturalist, and preserver of animals; made himself a violin and guitar; invented and executed a variety of machines; and was the first dentist in America that made sets of enamel teeth. At the age of twenty-six, he was first excited to become a painter by the desire of surpassing the wretched things which he happened to meet with. At this time, Hesselius, a portrait-painter from the school of Sir Godfrey Kneller, was living near Annapolis. Mr Peale, selecting the handsomest saddle his shop afforded, as a present to the artist, introduced himself, and solicited the favour of seeing, for the first time, the mysterious operations of painting. Mr Hesselius gave him essential instruction, and he afterwards received similar services from Mr Copley, on a visit to Boston. Soon after, by the aid of his friends, he went to England, and studied, during the years 1770 and 1771, in the royal academy at London, under the direction of Mr West. The writer of this article was informed by colonel Trumbull, that, one day when he was in Mr West's painting room, some hammering arrested his attention. "Oh," said Mr West, "that is only that ingenious young man, Mr Peale, repairing some of my bells or locks, according to custom." This custom, much to the comfort and amusement of many a host, he continued all through life, whenever he was on a visit in the country, either for business or pleasure. On his return to America, he removed to Baltimore, and afterwards to Philadelphia, where he opened a picture-gallery. For about fifteen years, he was the only portrait-painter in North America; and persons came to him to be painted even from Canada and the West Indies. During the revolutionary war, he raised a company, was often employed in confidential services, and was engaged in the battles of Trenton and Germantown. In 1777, he was elected a representative of Philadelphia in the state legislature, where he chiefly interested himself in the law for the abolition of slavery. During the revolutionary contest, he had painted the portraits of many distinguished officers, some of whom were afterwards killed. This collection constituted the chief interest of his gallery, and was, from time to time, extended, and afterwards made to comprise the portraits of men eminent in the different walks of life. Some large bones of the mammoth, found in Kentucky, and brought to him to be drawn, laid the foundation of his museum, when the name of *museum* was scarcely known even to our travellers, and Europe possessed none of great note but the celebrated Aldobrandine collection at Florence. The increasing income from his museum at length enabled Mr Peale to procure almost an entire skeleton of the mammoth, at an expense of 5000 dollars. A large quantity of the bones of an individual of this species was discovered in Ulster county, New York, which Mr Peale purchased, together with the right of digging for the remainder in a swampy marl pit, which was obtained after very great exertions. When the Pennsylvania academy of the fine arts was founded, he zealously co-operated for many years, and lived to contribute to seventeen annual exhibitions. After a life of extraordinary exertion and temperance, he died, in 1827, at the age of eighty-five.

PEAR; the fruit of the *pyrus domestica*, a tree growing wild in many parts of Europe, and now cultivated in all temperate climates. The pear tree belongs to the *rosaceæ*, and, by some authors, is placed in a different genus from the apple, from having flexible sides to the cells which contain the seeds, and from the turbinated form of the fruit. It is the largest of the genus, and reaches the height of forty feet, with the trunk two feet or more in diameter. The leaves are simple, alternate, oval, and finely serrated. The flowers are white, about an inch in diameter, and are disposed in terminal or lateral corymbs. The fruit, in a wild state, is regularly turbinated, about an inch either way, and to the taste is austere until perfectly ripe, when it becomes soft, juicy, and not disagreeable. In the cultivated plant, the fruit varies exceedingly in size, colour, taste, and time of ripening. The culture of the pear is very ancient, and several varieties were known to the Greeks and Romans. At the present day, more than two hundred, fit for the table, are enumerated, and constant accessions are made every year; for the seeds never reproduce the same variety without more or less modification. These varieties are perpetuated only by grafting; they differ in colour, being either greenish, yellowish, grayish, or reddish; in the consistence of the pulp, dry and firm, or melting and watery; and in taste, insipid, austere, acid, or sugary. A constant succession may be had from the beginning of summer, throughout the winter. Pears are chiefly used in deserts, and are generally considered much superior to apples; some varieties are stewed with sugar, baked, or preserved in sirup. France and the north of Italy are celebrated for the perfection to which they have carried the culture of this fruit. Even in districts where it grows wild, the tree is very liable to injury from frosts, which greatly diminish its bearing. There are, besides, numerous varieties of pears, cultivated solely for the purpose of making perry, a liquor analogous to cider, and prepared nearly in the same manner. This is less wholesome, and in general is less esteemed, than cider, though often very agreeable; indeed, many of the dealers in Champaigne wine are said to use perry to a great extent in the adulteration of it; and really good perry is little inferior to it in taste or quality. The wood is fine-grained, of a yellowish colour, and susceptible of a brilliant polish: it is not subject to the attacks of insects, and receives a black dye remarkably well, when it so much resembles ebony, that it can only be detected by the difference in specific gravity. In the early ages of Greece, this wood was employed in statuary; now it is used for musical instruments, the handles of carpenter's tools, and a great variety of mechanical purposes; it is, besides, excellent fuel. Nine other species of *pyrus*, as the genus is above restricted, are known; all natives of the temperate parts of the eastern continent.

PEARL. Pearls are produced by a testaceous fish of the oyster kind, which lives in the waters of the East and West Indies, and in other seas in warm latitudes. They are found in some parts of the globe in clusters of a great number, on rocks in the depths of the sea. Such places are called *pearl-banks*, of which the most famous are near the coast of Ceylon, and that of Japan, and in the Persian gulf, near the island of Bahreim or Bahrem. Near the coasts of Java, Sumatra, &c., the pearl is also found. The finest and most costly pearls are the Oriental. Some consider pearls to be unfructified eggs, others a morbid concretion or calculus, produced by the endeavour of the animal in the shell to fill up holes in the shell: others consider pearls as mere concretions of the juice of which the shell has been formed, and with which the animal annually augments it. To collect these shells is the business of divers, brought up to this most dangerous occupation from early youth. They descend from their boat with a rope fastened round their body, and a stone of twenty or thirty pounds weight attached to the foot to sink them. Generally they have to descend from eight to twelve fathoms, before they reach the shells. Their nostrils and ears are stopped up with cotton; to the arm a sponge, dipped in oil, is fastened, which the diver now and then brings to his mouth, in order to draw breath without swallowing water. Every diver has, besides, a knife, to loosen the shells, and a little net or basket, to collect them. When he has filled this, or is unable to stay any longer under water, he unlooses the stone quickly, shakes the line, and is drawn up by his companions. These divers are often destroyed by sharks; their health always suffers by this occupation. Other divers use the diving bell. The shells thus obtained are put into vessels, where they remain till the body of the animal putrefies, when they mostly open of themselves. Those which contain any pearls, have generally from eight to twelve. After being dried, they are passed through nine sieves of different sizes. The worth of a pearl is in proportion to its magnitude, round form, fine polish, and clear lustre. The largest are of the size of a small walnut; but these are very rare. Those of the size of a cherry are found more frequently, yet still very rarely. Pearls are round, pear-formed, onion-formed, and irregularly shaped. The small ones, sold by weight, are called *ounce pearls*, the smallest, *seed pearls*: these are converted into powder. In Europe, pearls of "white water" are the most sought for; the Indians and Arabians prefer those of "yellow water." Some have a lead colour, some incline to black, some are totally black.

Pearls are found in the Elster, a river in the Voigtland, in the kingdom of Saxony, from its origin down to the small town Elsterberg, as well as in the rivulets which fall into the Elster, Since 1621, a pearl fishery has been established there, of course for the benefit of the sovereign. Also in the river Watawa, in Bohemia, and in the Moldau river, from Krumau to Frauenberg, pearls are found, sometimes of great beauty, and difficult to be distinguished from the Oriental pearl. The fishery there is the property of the owner of the land. There are also pearl fisheries on the coasts of Scotland. Even in antiquity pearls were an object of luxury. A pearl which Pliny valued at about £84,000 of our present money, Cleopatra is said to have dissolved at a banquet, and drank off to Antony's health. Another, called *la peregrina*, was given to Philip II. of Spain. It was oval, and of the size of a pigeon's egg, and was valued at 80,000 ducats. Pearls were formerly used in medicine; but their medical operation is not different from that of any other calcareous earth. Linnæus discovered how to produce artificial pearls from the common river muscle; but the process has never been published, nor has it ever come into use. The shells of the pearl oyster are the substance called *mother of pearl*. See *Nacre*.

There is a very curious passage in Philostratus (*Vita Apollon.*), in which Apollonius the philosopher relates that the inhabitants of the shores of the Red sea, after having calmed the sea by means of oil, dived after the shellfish, enticed them, by means of some bait, to open their shells, and having pricked the animals with a sharp-pointed instrument, received the liquor that flowed from them in small holes made in an iron vessel, in which it hardened into real pearls. The Chinese at present cause a certain kind of muscles to form pearls. In the beginning of summer, when the muscles repair to the surface of the water, and open the shells, five or six small beads made of mother of pearl, and strung on a thread, are thrown into each of them. At the end of the year, when the muscles are drawn up and opened, the beads are found covered with a pearly crust, in such a manner that they have a perfect resemblance to real pearls. The truth of this, says Beckmann, in his History of Inventions, cannot be doubted. (See vol. ii. of the English translation of Beckmann.) In the same work curious facts respecting the discovery of Linnæus, and other points connected with this subject, are found under the head *Artificial Pearls*.

PEARL ASH. The common name for carbonate of potash. See *Potassium*.

PEARL, MOTHER OF. See *Nacre*.

PEARL POWDER. See *Bismuth*.

PEARL STONE. See *Pitchstone*.

PEASANTS' WAR. A war of the German peasantry in Suabia and Franconia, afterwards also in Saxony and Thuringia, against the oppressive taxes and services under which they languished. As early as the end of the 15th and the beginning of the 16th centuries, opposition was made to the bond-services in some places, and to the insupportable exactions of the nobility in others. The reformation in religion, which now excited universal attention, gave men the example of examining established usages, and a new desire for a better condition arose among the oppressed peasantry. The clergy and the nobility were deaf to their call; but the successful struggle for liberty in Switzerland gave them hope. The peasants of Alsace revolted, and, in 1513 and 1514, those of Wurtemberg. John Bohme, a young man of the territory of Wurzburg, declared that the Virgin had announced to him, that liberty and equality were now to be introduced among men; the earth was to be equally free for the use of all. 40,000 men are said to have collected around him, from Franconia, Suabia, Bavaria, and the Rhine. He directed his followers to appear armed on a certain evening, without their wives and children. He was, however, arrested by the bishop of Wurzburg. But 46,000 men marched to his rescue against the castle of Wurzburg. They were routed, and Bohme, with several others, executed. In 1525, the peasants rose again, and sent twelve articles to Wurzburg, in which they maintained the justice of their complaints. They principally wished, 1. to elect their own curates; 2. that the tithes should be appropriated solely to the maintenance of their curates; 3. that feudal services should be abolished; 4. that hunting and fishing should no longer be the exclusive privilege of princes and nobles; 5. that the feudal services should be more accurately determined, and the lord should not arbitrarily demand service from his vassal, &c.—The bishop promised to fulfil these demands; but the peasantry, who suspected his intentions, took up arms, and even the citizens, whom he called to his assistance, took their part. After Easter, in 1525, the peasantry in arms marched against Wurzburg; the bishop fled to Heidelberg. They took Wurzburg, and proceeded to burn and ravage the country around, but were beaten near Konigshofen and Sulzdorf; 9000 peasants were killed, or taken prisoners, and afterwards put to death. Wurzburg was compelled to surrender to the conquerors, and the bishop returned there June 8, 1825. This war was not suppressed in Franconia and Suabia till after it had cost the lives of more than 50,000 peasants, without their attaining their aim—the diminution of their burdens—which, on the contrary, were in some places increased. The troubles in Franconia and Suabia, were succeeded by the peasants' war in Saxony and Thuringia, which was principally excited by Thomas Munzer. (q. v.) See also the *History of the Peasants' War*, by Sartorius.

PEAT. See *Fuel*.

PECULATION; the term, in the Roman law, for the embezzlement of public money belonging either to the government or to communities. Under *peculation*, also, was comprised the adulteration of gold, silver, or any metal belonging to government. Connected with it, by a law of the dictator, Cæsar, were the *crimen de residuis* (if a person had received public money for a certain purpose, and did not apply it for the same), and the *sacrilegium* (the theft or misappropriation of money or other things sacred to a god). In most governments, the embezzlement of public money by public officers is severely punished. Peculation and treason were, by the French charter of 1814, the only crimes for which a minister was impeachable. For further information, see the article *Embezzlement*.

PECULIUM. The Roman slave, with every thing belonging to him, was, at first, the property of his master; but at a later period, a slave was permitted to have a property in a portion of the proceeds of his labour, as an incentive to diligence. This was styled his *peculium*; and masters were in the habit of making agreements with their slaves, who exercised some art or trade, that, if they gained a certain sum, they should be allowed to purchase their freedom with it; and such contracts were supported by law. The property of children who were still under the power of their father, was also called *peculium*; and in this, too, the earlier severity of the Roman law gradually gave place to milder provisions. Whatever the children received from their father (*peculium profectitium*) was the father's property, and might be at any time resumed by him; but the children had the use and management of it. What the children received from others, as presents, &c. (*peculium adventitium*), was, in a peculiar sense, their own; but the father had the disposition and use of it, unless an express condition had been made to the contrary, (*peculium adventitium irregulare*). Every thing was free from this jurisdiction of the father which the son obtained in war, or for warlike uses (*peculium castrense*), or in the service of the state (*peculium quasi castrense*).

PEDAGOGUE, with the Romans and Greeks; a slave, who carried the children of his master to school. Since slaves and freedmen often made attainments in science, they were frequently used as tutors; and the Greek word *pedagogue* thus came, at a later period, to signify a teacher of children. In English, the idea of pedantry is generally connected with it; but the Germans use the word for any man who studies and practises scientifically the education of the young. There is no corresponding word in English, the words *instructer*, or *teacher*, which are commonly used, not implying necessarily that he who teaches is scientifically trained. By *pedagogics* the Germans designate the science of education so much cultivated by them. This was first treated as a separate branch by the Greeks and Romans, among whom Plato, Aristotle, Xenophon, Plutarch, and Quintilian, became the teachers of future instructers. In the middle ages, school instruction was confined to the convents, to which all remnants of civilization had fled. The science of education after that made but slow advances, until the reformation broke down so many of the obstacles to human progress. The Germans, British, and French, have, of late, contributed most to the advancement of this science.

PEDAL HARP. See *Harp*.

PEDALS; the keys played by the feet (hence the name), by which the deepest bass pipes of an organ are put in motion. They generally do not much exceed an octave. (See *Organ*). Long since the pedal was used under a harpsichord, and lately it has been employed to strengthen the tones of the piano. In the case of the harp, the pedal serves to elevate the notes half a tone.

PEDEE; two rivers of South Carolina, the larger called the *Great Pedee*, and the smaller the *Little Pedee*. The Great Pedee rises in South Carolina, where it is called the *Yadkin*, and runs south-southeast into Winyaw bay, near Georgetown, and communicates with the Atlantic, twelve miles below Georgetown. It is navigable for boats of sixty or seventy tons about 200 miles. The Little Pedee rises in North Carolina, and unites with the Great Pedee, thirty-two miles above its mouth.

PEDELL (Low Latin *bedellus*, from the Saxon *bidele*); the German name for certain inferior executive officers, now only used for such as are attached to German universities. The origin of the English word *beadle* is the same. The *pedell* is constantly at war with the students, and is therefore quite a classical person in the reminiscences of German college life.

PEDESTAL. See *Architecture*.

PEDIMENT. See *Architecture*.

PEDOBAPTISTS. See *Baptists*.

PEDRO I., Antonio Jose d'Alcantara, dom, ex-emperor of Brazil, son of John VI., king of Portugal, and elder brother of dom Miguel, was born at Lisbon, October 12th, 1798, and, in 1808, was taken, with the rest of the royal family, to Brazil. At an early age, he conceived a strong predilection for music, for which he showed a decided talent. He not only learned to play on a variety of instruments, but composed much of the music for his father's chapel, and also wrote and set to music one of the most popular Brazilian songs. On the return of his father to Portugal in 1821, dom Pedro remained in Brazil, as prince-regent; but, in the next year, Brazil declared itself independent, and the prince assumed the title of emperor. The history of this revolution, and of the reign of Pedro, will be found in the articles *Brazil*, and *Banda Oriental*. His imperial title was acknowledged, in 1825, by John VI., who, dying in 1826, also left him the crown of Portugal. The emperor, however, after granting a constitution to Portugal, resigned the crown to his daughter, donna Maria (born in 1819), and appointed his sister regent of Portugal. (See *Portugal*.) Pedro married, in 1817, Leopoldine, arch-duchess of Austria, daughter of the emperor Francis I., by whom he had five children, among whom were the princess donna Maria and dom Pedro II., late emperor of Brazil (born 1825). She died in 1826, a reputed victim of his attachment for the marchioness of Santos, to whom, also, it is said, was owing a change of ministry which took place at about that time. His second wife (whom he married in 1829) was Amelia, princess of Leuchtenberg (born 1812). An account of the events which led to Pedro's abdication of the crown of Brazil, in favour of his son dom Pedro II., will be found under the article *Brazil*. He embarked on board an English ship of war for Europe, in the spring of 1831, and arrived in France in June. Operations immediately commenced for displacing his brother, dom Miguel, from the throne of Portugal, and establishing donna Maria as queen, under a regency. The history of the unhappy contest for supremacy, which followed between the two brothers, will be found under the article *Portugal*. Dom Pedro's death took place in 1834.

PEER (from *pares*, in French *pairs*), in general, signifies an equal; one of the same rank and station. In this sense it is used by the common law of England, which declares that every person is to be tried by his peers. (See *Jury*.) Peer also signifies a nobleman in Britain; in France, it signifies those nobles who have a seat in the upper house. In the article *Britain*, division *Constitution*, we have spoken of the power of the house of peers of Britain. In the article *Parliament*, we have touched upon the forms of transacting business in the house of lords. In the article *Legislature, Houses of*, additional remarks on this house may be found. We shall here say a few words on the history and privileges of the peerage.

The dignity and privileges of peers (*pares curiæ, pares regni*) originated with the growth of the feudal system. The members of communities in ancient times, the companions of the *Herzoge* (dukes), the assemblies of the chief men among the people (the *Wittenagemote* of the Anglo-Saxons, and the *campus Martius* of the Franks), are not the same as the peers of later times. But in the feudal system, the principle was developed, that every association should take care of its own affairs, including the judicial decision of disputes among themselves and with their superiors; and it became an obligation as well as a privilege of the vassal to appear at the court of the immediate lord, on days of state and of the administration of justice. These were the *pares* *curiæ;* and the institution was extended from the court of the king to the principalities and lordships of the spiritual and secular barons. In France, at the time of the revolution by which Hugh Capet ascended the throne in 987, there were but seven secular princes immediate vassals of the crown—the dukes of France, Burgundy, Aquitaine, and Normandy, and the counts of Flanders, Toulouse, and Champagne. When the duke of France became king, there remained but six, to whom were added the archbishop of Rheims as spiritual primate of France, and the bishop of Laon, with the title of *duke*, those of Beauvais, Noyon, and Chalons, with that of *count*, and at a later period, under Louis VII., also the bishop of Langres, because their dioceses were situated within the immediate domains of the crown. This ancient peerage did not exist long, and the members were rather titular dignitaries than active instruments in the administration of the realm. The ancient principalities of peers were, by degrees, united with the crown, only the spiritual lords maintained their titles. However, the immediate vassals of the principalities, of the king as former duke of France, of the dukes of Guienne, Normandy, Brittany, and the prince counts, continued to appear on days of state and of the administration of justice; and when standing courts (*parliaments*, q. v.) grew out of these, they retained their seats, until they were gradually displaced by the preponderance of the professional members. The ancient peerage, however, has several times acted as a judicial tribunal in the case of the trial of princes of the realm; for instance, when king John of England, in 1200, was cited to appear on account of the murder of his nephew, Arthur of Brittany, and was declared to have forfeited his fief of Brittany. Instead of the old peerages, the territories of which were united with the crown, new ones were created; among others the dukedom of Brittany, the counties of Artois and Anjou, in 1296, the new duchy of Burgundy, for Philip the Bold, in 1361, which were followed by the creation of other dignities, in the beginning merely for princes of the blood, but since 1551, also for other eminent persons. Under Louis XIV., the number of peers (*ducs et pairs*) was still increased; yet, besides their rank, a seat in the parliament was their only privilege. Among these new peerages was that of the archbishop of Paris, who, as a secular peer, was called *duke of St Cloud:* the most ancient was the duke of Uzès, of the year 1572; the latest the English duke of Richmond. There were thirty-seven of them. At the coronation, the ancient twelve peers were represented. The revolution of the last century, of course, abolished the French peerage; but Louis XVIII. re-established it after the model of that of England, by the charter of 1814. In the article *France*, we have given their privileges, and the right of the crown to establish them. Villèle created, under Charles X., seventy-six new peers at once, and when the charter was amended in consequence of the revolution of 1830, several changes were made in relation to the peers, and, by a special provision, "all the creations of peers during the reign of Charles X. are declared null and void;" they amounted to ninety-three. It was provided, also, that article twenty-third of the charter should undergo a fresh examination during the session of 1831. That article runs thus; "The nomination of the peers of France belongs to the king. Their number is unlimited: he can vary their dignities, and name them peers for life, or make them hereditary, at his pleasure." The new law abolishing hereditary peerage very readily passed the chamber of deputies; but its fate in the house of peers was not settled until thirty-six new peers were created for life, Nov. 19th, 1831. It finally passed this house, December 28th, by a majority of thirty-three. It was a radical fault in the French charter of 1814, to establish a peerage after the model of the English, whilst none of the foundations, on which the English peerage rests, exists in France. Napoleon's judgment on this point was very correct. He said to Benjamin Constant, "The peerage is not in harmony with the present state of public opinion. It would wound the pride of the army; it would deceive the expectation of the partisans of equality; it would raise against us a thousand individual pretensions. Where do you expect me to find the elements of aristocracy which the peerage requires? The ancient fortunes are hostile; several of the modern ones dishonourable. Six or seven illustrious names do not suffice. Without remembrances, without historical *éclat*, without large properties, on what would my peerage rest? That of England is something totally different: it is above the people, but it has not been against it. It was the nobles who gave liberty to England. The great charter comes from them; they have grown great with the constitution, and have been born with it. But within thirty years my mushrooms of peers would be nothing but soldiers or chamberlains. You would only see a camp or a chamber."

In England, the peerage originated as in France. This dignity belongs to the five degrees of nobility (duke, marquis, earl, viscount, and baron), by right, which is not the case with the French nobility, though the idea of *mésalliance* does not prevail by any means to the same extent in England as on the continent of Europe. In the beginning, all the crown vassals appeared at court on the days of state, and attended the diets; afterwards only those who were summoned to appear by writ. This custom grew at length into a rule, and the summonses were considered proofs of hereditary peerage. There is one lordship—the borough of Arundel—which confers the dignity of earl on its possessor by prescription. In regard to all other titles, the peerage is personal, and descends in a direct line from male to male. The chief privileges of peers are that of a seat in the house of lords, of a trial by persons of noble birth, in case of indictments for treason and felony, and misprision thereof, and of exemption from arrest in civil cases. The number of Catholic peers in Great Britain and Ireland is about twenty. The expenses attendant on the creation of a peer in England, including the fees paid at the herald's office, &c., amount to £600

PEGASUS, in fabulous history, a winged horse, sprung from the blood of Medusa, when Perseus had cut off her head. He received his name from his being born, according to Hesiod, near the *sources* (*πηγαι*) of the ocean. As soon as born, he left the earth, and flew up into heaven; or rather, according to Ovid, he fixed his residence on mount Helicon, where, by striking the earth with his foot, he instantly raised a fountain, which was called *Hippocrene*. He became the favourite of the muses, and, being afterwards tamed by Neptune or Minerva, he was given to Bellerophon to conquer the Chimæra. (See *Hipponous*.) No sooner was this monster destroyed, than Pegasus threw down his rider, because he attempted to fly to heaven. This act of temerity in Bellerophon was punished by Jupiter, who sent an insect to torment Pegasus, which occasioned the melancholy fall of his rider. Pegasus continued his flight up to heaven, and was placed among the constellations by Jupiter. Perseus, according to Ovid, was mounted on the horse Pegasus, when he destroyed the sea-monster, which was going to devour Andromache.

PEGU, or BEGU; till 1757, a kingdom of Asia, now a province of the Birman empire, bounded north by Aracan and Ava, east and south by Siam and the sea, and west by part of Aracan and the bay of Bengal. Pegu seems to be a level country, without any considerable mountains, excepting some which surround it, and serve for a frontier towards the land, but is liable to be invaded not only by sea, but also by land, by means of the rivers which make their passage through those mountains. The two principal rivers are the Irrawaddy and Sitang. The air is healthy; the soil very fertile in rice, corn, fruit, and roots; it likewise produces good timber of several kinds. The country abounds with elephants, buffaloes, goats, hogs, and other animals: here is abundance of wild game, and deer in great plenty. There are mines not only of iron, tin, and gansa, or lead, which passes for money, but also of rubies, diamonds, and sapphires. The rubies are the best in the world; but the diamonds are small. But the most valuable production is teak timber, for ship-building. The principal ports are Rangoon, Sirian, and Negrais. The inhabitants are mostly idolaters of the sect of Budda. Pegu was formerly the capital; lon. 96° 42′ E.; lat. 18° 5′ N.; population, 7000. This city, in the year 1600, was splendid, large, and populous, supposed to contain 150,000 inhabitants. According to some Europeans, who saw it in its greatest splendour, it was very spacious, fair, and strong, surrounded with stone walls and very wide ditches. It was divided into two cities, the old and new; in the old lived the merchants and strangers; and, as the houses were only built with wood, or bamboo canes, covered with tiles, each had a warehouse of brick, arched, to secure the goods from fires, which were frequent here. The new city, inhabited by the king, the nobility and the people of fashion, was extensive and populous; its figure square; and in each side of the wall were five gates of stone, with many gilded towers by the side of it for posting sentries. It was encompassed with broad ditches, in which were bred crocodiles, to deter people from wading over them. The king's palace stood in the midst of this new city, built like a fortress, with walls and ditches. In 1757, Pegu was destroyed by Alompra, the Birman emperor; but the temples were left standing, and the temple of Shoemadoo still exists as a monument of the greatness of its ancient monarchs. It stands upon two quadrangular terraces, of which the lower is ten feet high, the upper, twenty feet. The sides of the former are each 1391 feet in length, of the latter, 684. The temple is a massive pyramid of brick and mortar, without any excavation or aperture, octagonal at the base, each side of which measures 162 feet. A projecting part round the base is surmounted with fifty-seven turrets, twenty-seven feet high. On this stands a second projection, surmounted by fifty-three similar towers. The whole is crowned by a Tee or iron summit, on which is a gilt umbrella, fifty-six feet in circumference, 360 feet from the ground. The Tee is gilt, and beneath it hang numerous bells, which the wind keeps constantly ringing. In each angle of the upper terrace are temples, sixty-seven feet high, resembling the principal temple. All around the steps are innumerable images of Godama or Budda. The priests say that the Shoemadoo was begun 2000 years ago.

PEHLVI. See *Persian Language*.

PEIPUS, or TCHUDSKO; a deep lake, between the Russian governments of Livonia, Esthonia, Pskov, and St Petersburg (eighty versts long by thirty broad). It is connected with lake Pskov, or Pleskov, by a narrow channel, with lake Virtz by the Eno, and with the gulf of Finland by the Narova or Narva. In the brilliant days of the Hansa, it had considerable navigation.

PEISHWAH. See *Mahrattas*.

PEKAN. See *Weasel*.

PEKAN-NUT. See *Walnut*.

PEKING, or PEKIN; a city of China, capital of the empire, situated in a very fertile plain, twenty leagues distant from the great wall; lon. 116° 23′ E.; lat. 39° 54′ N. The city encloses an area of fourteen square miles, exclusive of the suburbs, and is divided into two towns, the one inhabited by Tartars, and the other by Chinese. The Chinese city has a wall of its own, enclosing an area of nine square miles. The estimated population of Peking, says Sir G. Staunton, was carried in the last century, by the Jesuit Grimaldi, to 16,000,000. Another missionary reduces, at least that of the Tartar city, to 1,250,000; according to the best information given to the embassy, the whole was about 3,000,000; but this number is probably exaggerated. The low houses of Peking seem scarcely sufficient for so vast a population; but very little room is occupied by a Chinese family, at least in the middling and lower classes of life. In their houses there are no superfluous apartments. A Chinese dwelling is generally surrounded by a wall six or seven feet high; within this enclosure a whole family, of three generations, with all their respective wives and children, will frequently be found. One small room is made to serve for the individuals of each branch of the family, sleeping in different beds, divided only by mats hanging from the ceiling. One common room is used for eating.

Peking contains thirty-three temples, eight public altars, as the altars of heaven and earth (on the former of which the emperor sacrifices in summer, the latter in winter), those of eternal life, of the sun, of the moon, and of agriculture, two Catholic churches (Portuguese and French), several monasteries, two Russian-Greek churches, with a monastery (whose archimandrite, and eight monks, usually selected from the pupils of the Russian seminaries, are changed every four years; four of the latter learn the Chinese and Mantchoo languages, and are destined for interpreters), four mosques, a foundling hospital, twenty-six tribunals, and 10,000 palaces. The name *Peking*, which signifies the *northern court*, is given to distinguish it from *Nanking*, or the *southern court*. The emperor formerly resided in the latter; but the Tartars, a restless and warlike people, obliged the prince to remove his court to the northern provinces, that he might more effectually repel the incursions of those barbarians, by opposing to them the numerous militia that he generally keeps around his person. This capital forms an exact square, and is divided into two cities; the first is inhabited by Chinese, the second by Tartars. These two cities, without including the suburbs, are six leagues in circumference. The walls of the Tartar city are very lofty, and so thick, that twelve horsemen might easily ride abreast upon them; with spacious towers at intervals, a bow-shot distant from one another, and large enough to contain bodies of reserve in case of necessity. The city has nine gates, which are lofty, and well arched; over them are large pavilion-roofed towers, divided into nine stories, each having several apertures or port-holes; the lower story forms a large hall, for the use of the soldiers and officers who quit guard, and those appointed to relieve them. Before each gate a space is left of more than 360 feet; this is a kind of place of arms, enclosed by a semicircular wall, equal in height and thickness to that surrounding the city. The great road which ends here, is commanded by a pavilion-roofed tower, like the first, in such a manner that, as the cannon of the former can batter the houses of the city, those of the latter can sweep the adjacent country. The streets of Peking are straight, the principal ones about 120 feet wide, a full league in length, and bordered with shops. It is astonishing to see the immense concourse of people that continually fills them, and the confusion caused by the prodigious number of horses, camels, mules, and carriages, which cross or meet each other. It is very singular that, in all this prodigious concourse, no women are ever seen. The emperor's palace stands in the middle of the Tartar city. It presents a large assemblage of vast buildings, extensive courts, and magnificent gardens, and is shut up on all sides by a double wall; the intervening space being occupied by horses belonging to the officers of the court, eunuchs, and by different tribunals. The exterior circumference of this immense palace is reckoned a league and a half. Although the Chinese architecture has no resemblance to that of Europe, the imperial palace of Peking does not fail to strike beholders by its extent, grandeur, and the regular disposition of its apartments. The royal hall, called *Tai-hotien*, or the *hall of the grand union*, is built upon a terrace, about eighteen feet in height, incrusted with white marble, and ornamented with balustrades of excellent workmanship. This hall is almost square, and about 130 feet in length. The ceiling is carved, varnished green, and loaded with gilt dragons, covered with coarse carpets, after the Turkish manner; but the walls have no kind of ornament, neither tapestry, lustres, nor paintings. The throne, which is in the middle of the hall, consists of a pretty high alcove, exceedingly neat. It has no inscription but the character *Ching*, which signifies *holy, perfect, excellent.*

PELAGIANISM is that theological view which denies the total corruption of men, attributed to the fall of Adam (original sin), and declares man's natural capacity sufficient for the exercise of Christian duties and virtues, provided he have but an earnest purpose to do well. It does not exclude faith in divine assistance towards man's improvement, but believes this assistance will be granted to those only who strive to improve themselves. This view was broached by the English monk Pelagius, who, in the fifth century, resided in Rome, with the reputation of great learning and an unspotted life, and fled from that city when it was taken by the Goths, in 409, with his friend Cœlestus, to Sicily, and thence to Africa, where Augustine declared him a heretic; in which several African synods concurred. Pelagius travelled to Jerusalem, and there closed his life in tranquillity, in the year 420, at the age of ninety years. The philosophical soundness and noble frankness of his writings, together with his own great virtue in a time of universal and deep-rooted corruption, procured many adherents to his opinions, which at all times have been considered, by some of the purest and most reflecting men, as the only ones worthy of the Deity. He never attempted to found a heretical or dissenting sect, yet the Pelagians, whose views were formally condemned at the council of Ephesus, in 431, and the Semi-Pelagians, founded by John Cassianus at Marseilles (died in 435), who somewhat modified the orthodox dogma of the utter insufficiency of man's nature for virtue, occupy a very important place in ecclesiastical history. Respecting the various forms and names, under which the contest of the rigid doctrines of Augustine with the milder views of Pelagius has been renewed in the Christian church, see the article *Grace*; see also Wigger's *Pragmatische Darstellung des Augustinismus und Pelagianismus* (Berlin, 1821), Mosheim's *Ecclesiastical History*, &c.

PELASGIANS; the oldest inhabitants of Greece. They dwelt first in the Peloponnessus, whither they were probably driven from the coasts of Asia Minor, by the islands, or through Thrace and Thessaly. They lived in wandering hordes, without any political union, and worshipped a rude stone, or a head with a pointed beard, which was set upon it, as the image of the Deity. They were secured from the invasion of other hordes, by the boggy and mountainous nature of the peninsula; and two tribes of them, who established their residence on the borders of the gulf of Corinth, abandoned their barbarous manners earlier than the others. Here arose the kingdoms of Argos and Sicyon, where Inachus and Phoroneus reigned. Pelasgus, the grandson of the latter, founded a nomadic state in Arcadia; hence the tradition, that those Arcadian hordes received the name of *Pelasgians* from him, which was afterwards given to all the original inhabitants of ancient Greece. From this Arcadian state of Pelasgians proceeded several colonies, particularly in Northern Thessaly, where their leaders, Achæus, Phthius, and Pelasgus founded the cities Achaia, Phthiotis, and Pelasgiotis; they also established colonies in the countries afterwards called Bœotia and Attica, and also in Epirus and Italy. The celebrated Cyclopean walls, are their work, and they are renowned for their skill in agriculture and the building of cities. They gradually became extinct, by wandering from Greece, or mingling with other clans. Notwithstanding the investigations of learned antiquarians, much obscurity still hangs over the history of this people, and the name *Pelasgians* seems to require to be taken in more than one signification.

PELEUS, in fabulous history; son of Æacus king of Ægina, and Endeis. Having unintentionally taken part in the murder of his half brother Phocus, he fled with Telamon to Phthia, to the court of Eurythion, the son of Actor, who purified him from the murder, and gave him his daughter in marriage, with a third part of his kingdom. Peleus now went with Eurythion to Calydon, to aid in hunting the celebrated boar. On this expedition he accidentally killed his father-in-law with a javelin which he aimed at the boar. Upon this, he fled to Iolchos, to Acastus, who purified him from the deed. Astydamia, the wife of Acastus, became enamoured of him, and because Peleus refused to gratify her desires, she accused him of a criminal passion for her, and thus endeavoured to make him an object of hatred to her husband and to his own wife. Antigone hung herself in despair; but Acastus, unwilling to violate the laws of hospitality, selected a hunting party to go to mount Pelion, with the intention of having Peleus put to death. Overcome with fatigue, he fell asleep on the mountain, and Acastus caused his sword to be taken from him, and then bound him, that he might become the prey of wild beasts. But Jupiter sent Pluto to deliver him from his bonds, and when he awoke, Chiron, his mother's father, brought him back his sword. He then invaded Iolchos with Jason, the Dioscuri, and a band of brave warriors, put Acastus to flight, and the queen to death. Thus he became master of a part of Thessaly. The gods rewarded his continence by giving him, at the suggestion of Themis, the nymph Thetis for a wife, of whom he obtained possession by the assistance of Chiron. The nuptials were celebrated on mount Pelion, and honoured with the presence of all the gods, who brought rich bridal presents. Neptune gave Peleus the immortal horses, and Chiron the strong spear, which afterwards served Achilles before the walls of Troy. Many ancient poets celebrated these nuptials, of whose songs, only an echo remains to us in the *Epithalamium* of Catullus. Some later poet connected with this marriage the fate of Troy. (See *Eris*.) Peleus, who, in his youth, had been present on the Argonautic expedition, now ruled the Myrmidons in Phthia. Homer calls him an eloquent, and powerful, and wise man. Of all the children of

Peleus and Thetis, Achilles only reached the age of manhood. Peleus educated him with Patroclus, who had fled to him for safety, and reluctantly suffered him to go to the siege of Troy. Thetis deserted him, and he had the grief to survive his beloved son. After his death he received divine honours, together with Chiron, from the inhabitants of Pella, in Macedonia; and Pindar mentions him as one of the judges in the infernal regions.

PELEW ISLANDS, or PALAOS; a cluster of islands in the western part of the Pacific ocean, situated between the Philippine and Caroline islands. They are about eighteen in number. In the year 1783, captain Wilson, commander of the Antelope packet, in the service of the East India company, was wrecked on this coast. These islands were probably first noticed by some of the Spaniards of the Philippines, and by them named the *Palaos Islands*, from the tall palm-trees which grow here in great abundance. The inhabitants had been represented as inhuman and savage, and feeding on human flesh: captain Wilson, on the contrary, found them hospitable, friendly, and humane. These islands are long, but narrow, of a moderate height, well covered with wood, at least such of the islands as captain Wilson's people had an opportunity of seeing. They are bordered on the west side by a reef of coral. The country produces some sugar-canes, and great abundance of the bamboo; likewise the turmeric, which the natives use as a dye, and with which the women stain their skin. None of the islands which the British visited had any kind of grain, nor any quadruped whatever, except some brownish-gray rats which ran wild in the woods, and three or four meagre cats, which were seen in some houses at Pelew. The islands, when viewed from the sea, exhibit high rugged land, well covered with wood; the interior part is in many places mountainous, but the valleys are extensive and beautiful, spreading before the eye many delicious prospects. The soil is, in general, rich. Lon. 134° 40′ E.; lat. between 6° 54′, and 8° 12′ N.—See Keate's *Account of the Pelew Islands*, and Hochin's *Supplement to the Account* (London, 1803).

PELIAS; in fabulous history, son of Neptune, king of Iolchos, in Thessaly, from the throne of which he drove its lawful possessor, his brother Æson. He also removed his son Jason, but perished on his return. According to tradition, his own daughters, following the advice of the cunning Medea, who promised to renew his youth by her magical power, killed him, and boiled his dismembered remains in a caldron: some say that Medea killed him herself. His son and successor, Acastus, instituted splendid games in honour of the dead, in which some of the most celebrated Argonauts bore off the prizes.

PELICAN (*pelecanus*, Lin.); bill long, straight, broad, much depressed; upper mandibles flattened, terminated by a nail, or very strong hook, the lower formed by two bony branches, which are depressed, flexible, and united at the tip; from these branches is suspended a naked skin, in form of a pouch; face and throat naked; nostrils basal, in the form of narrow longitudinal slits; legs short and strong; all the four toes connected by a web; wings of moderate dimensions. The pelicans are large birds, which reside on rivers, lakes, or along the sea-coasts. Though excellent swimmers, they also occasionally perch on trees. They are gregarious, very fond of fish, and when harassed or pursued, readily reject the contents of their stomach, like the gull tribe. They store up their prey in their gular pouch, from which it is gradually transferred into the *œsophagus*, as the process of digestion goes on. Though remarkable for their voracity, some of the species have been trained to fish in the service of man. In external appearance the sexes very nearly resemble each other.

P. onocrotalus, Lin., &c.; *white*, or *common pelican;* white, faintly tinged with flesh colour, gullet with a bright yellow pouch. The spurious wings and first quill feathers are black. The bag at the throat is flaccid, membranous, and capable of great distention. Length between five and six feet; extent of wing eleven feet, being rather larger than the swan, though with much shorter legs. The young are distinguished by the prevalence of cinereous in their plumage, and have been erroneously designated *P. Philippensis* and *P. fuscus*, by Gmelin and Latham. This bird has its specific name from its cry, which is loudest during flight, and which the ancients compared to the braying of an ass; inhabits Asia, Africa, and South America. About the middle of September, flocks of this species repair to Egypt, in regular bands, terminating in an obtuse angle. During the summer months, they take up their abode on the borders of the Black sea and the shores of Greece. They are rare in France, and unknown in Great Britain. In fishing, they do not immediately swallow their prey, but fill their bag, and return to the shore to consume at leisure the fruits of their industry. As, however, they quickly digest their food, they generally fish more than once in the course of the day, and, for the most part, in the morning and evening, when the fish are most in motion. A single pelican will, at one repast, despatch as many fish as would suffice for six men; and in confinement, it will, moreover, snap up rats and other small quadrupeds. At night, it retires a little way on the shore to rest, with its head leaning against its breast; and in this attitude it remains almost motionless, till hunger calls it to break off its repose. It then flies from its resting-place, and, raising itself thirty or forty feet above the surface of the sea, turns its head, with one eye downwards, and continues on wing till it sees a fish sufficiently near the surface, when it darts down with astonishing swiftness, seizes it with unerring certainty, and stores it up in its pouch; it then rises again, and continues the same manœuvres till it has procured a competent stock. The female feeds her young with fish that have been macerated for some time in her pouch. The pelican is not only susceptible of domestication, but may even be trained to fish for its master. When a number of pelicans and corvorants (cormorants) get together, they are said to practise a singular method of taking fish; for they spread into a large circle, at some distance from land, the pelicans flapping on the surface of the water with their extensive wings, and the corvorants diving beneath, till the fish contained within the circle are driven before them towards the land; and, as the circle contracts by the birds drawing closer together, the fish are at length reduced within a narrow compass, when their pursuers find no difficulty in securing them. In this exercise, they are often attended by various species of gulls, which participate in the spoil. The pelican generally breeds in marshy and uncultivated places, particularly about islands and lakes, making its nest, which is deep, and a foot and a half in diameter, of sedges and aquatic plants, and lining it with grass of a softer texture; but it frequently dispenses with any such formal construction. It lays two or more white eggs, of equal roundness at the two ends, and which when persecuted, it sometimes hides in the water. When it nestles in dry and desert places, it brings water to its young in its bag, which is capable of containing nearly twenty pints of liquid; but that it feeds them with its own blood, must be ranked among the fabulous assertions of antiquity. Its flesh is very generally disliked.

PELIDES; son of Peleus. (q. v.) See also *Achilles.*

PELIOM. See *Iolite.*

PELION (now *Sagari*); a high mountain in Thessaly, producing various medicinal herbs. On one of its summits stood a temple of Jupiter. In the neighbourhood we find the grotto of the centaur Chiron. In the war of the Titans with the gods, the former, say the poets, piled Ossa upon Pelion, to aid them in climbing to the dwellings of the latter.

PELLAGRA. The pellagra of the Lombardo-Venetian plains, a horrible malady, or complication of maladies, has only been observed during the last sixty or eighty years, and is rapidly increasing. A sixth or seventh of the population are affected in those parts of the country where it is most prevalent. It begins by an erysipelatous eruption on the skin, which breaks out in the spring, continues till the autumn, and disappears in the winter, chiefly affecting those parts of the surface which are habitually exposed to the sun or air, is accompanied or preceded by remarkable lassitude, melancholy, moroseness, hypochondriasis, and not seldom a strong propensity to suicide. With each year, the disorder becomes more aggravated, with shorter and shorter intervals in the winter. At length the surface ceases to clear itself, and becomes permanently enveloped in a thick, livid, leprous crust, somewhat resembling the dried and black skin of a fish. By this time, the vital powers are reduced to a very low ebb, and not seldom the intellectual functions. The miserable victim loses the use of his limbs, more particularly of the inferior extremities; is tormented with violent colic, headache, nausea, flatulence and heartburn, the appetite being sometimes null, at others voracious. The countenance becomes sombre and melancholy, and totally void of expression. But the most distressing phenomenon of all is a sense of burning-heat in the head and along the spine, from whence it radiates to various other parts of the body, but more especially to the palms of the hands and soles of the feet, tormenting the wretched victim day and night, and depriving him completely of sleep. He frequently feels as if an electric spark darted from the brain and flew to the eyeballs, the ears, and the nostrils, burning and consuming those parts. To these severe afflictions of the body are often added strange hallucinations of the mind. The victim of pellagra fancies that he hears the incessant noise of millstones grinding near him, of hammers resounding on anvils, of bells ringing, or the discordant cries of various animals. The disease, when advanced, takes the form of many other maladies, as tetanus, convulsions, epilepsy, dropsy, mania, and marasmus, the patient ceasing, at last, to exist and to suffer, when reduced to the state and appearance of a mummy. It is by no means uncommon that the wretched being anticipates the hand of death, in a paroxysm of suicidal mania, very often by drowning. It is almost confined to those who reside in the country, leading an agricultural life, and to the lowest orders of society. It is not bounded by any age, being frequently seen in the youngest children. The whole of the flat country on both sides of the river Po, but more especially the fertile and level plains between that river and the Alps, are the theatre and head-quarters of pellagra.

The cause of this frightful endemic has engaged the pens of many learned doctors; but it is just as inscrutable as the causes of hepatitis on the coast of Coromandel, elephantiasis in Malabar, berriberi in Ceylon, Barbadoes Ly in Antibes, goitre among the Alps, the plica in Poland, cretinism in the Valais, or malaria in the Campagna di Roma. The general opinion among the medical men of the Milanese is, that the pellagra results from the extreme poverty, and low, unwholesome diet, of the peasantry. See doctor Johnson's *Autumnal Excursion through France, Switzerland, and Italy.*

PELOPIDAS; son of Hippocles, a Theban general, friend and contemporary of Epaminondas, who lived till B. C. 364. To him belongs the honour of having freed his country from a tyrannical faction, and from the Lacedæmonian yoke. Having been banished from Thebes with several other patriots, he retired to Athens. Animated with an ardent love of liberty, he disguised himself, and went to Thebes with a few conspirators, put to death the tyrants at a banquet where they were all assembled, and gave the signal for the expulsion of the Lacedæmonians, who had taken possession of the citadel in a time of peace. Pelopidas then served under Epaminondas with distinguished courage, and contributed much to the victory over the Lacedæmonians at Leuctra. He was afterwards commander-in-chief in three campaigns against Alexander, tyrant of Pheræ, in Thessaly, who had once imprisoned him without any just cause; but, having pursued the prince too far, he was surrounded by the enemy, and fell.

PELOPONNESUS; a celebrated peninsula, which comprehends the most southern part of Greece. It received this name from Pelops, who settled there, as the name, *the island* (νησος) *of Pelops*, indicates. It had been called before *Ægialea*, *Apia*, *Pelasgia*, and *Argos*. Its present name is *Morea*, (q. v.). Peloponnesus was divided into six provinces, Messenia, Laconia, Elis, Arcadia, Achaia, and Argolis, to which some add Sicyon. The Peloponnesus was conquered some time after the Trojan war, by the Heraclidæ, or descendants of Hercules, who had been forcibly expelled from it.

Peloponnesian War; a war carried on for twenty-seven years by Sparta and most of the Peloponnesian cities against Athens, who had long provoked the vengeance of the Greeks by the oppression of her allies. Athens herself hastened the commencement of hostilities, by aiding Corcyra in a contest with Corinth, and, on a new opportunity, engaged in new acts of violence against the latter: Corinth, therefore, invited Sparta, already jealous of the power of Athens, to take part in the war. The Spartans prepared for the contest; but, to save appearances, they made proposals of peace humiliating to Athens, which produced no result. A destructive war now broke out, B. C. 431. All the people of Peloponnesus, except the Argives and Achæans, took the side of the Spartans; but the Grecian cities on the coasts of Asia, those in Thrace, and on the Hellespont, favoured the cause of the Athenians, who had the advantage in point of strength; for although the Spartans could bring into the field a more numerous land force than their enemies, they were deficient in fortifications, money, and ships. Led by their king Archidamus, 60,000 Spartans marched into Attica, and laid waste the country with fire and sword. Pericles (q. v.), at the head of the Athenians, sailed to the Spartan shores, and ravaged them in the same manner. Thus the war was carried on for several years, with mutual devastations, till the Athenians were overcome. A pestilence now broke out, which carried off Pericles among others; and, after ten years of constant warfare, the parties were permitted to enjoy a peace, which, however, was but temporary. By the advice of Alcibiades, the Athenians undertook a campaign against Syracuse, which was unsuccessful. Alcibiades, who was in the mean time banished from Athens, and had fled to Sparta, advised the Spartans to send troops to the assistance of the people of Syracuse, which gave rise to a renewal of the war. The greater part of the islands, the cities on the Hellespont and in Ionia, sided with the Spartans. They even concluded an alliance with the Persians against Athens, which, however, was saved by Alcibiades. He had escaped from Sparta in disguise, persuaded the Persian satrap Tissaphernes to break his alliance with that city, and gained so many friends in Athens, that he was recalled, and appointed general. He gained some splendid victories over the Peloponnesians, reconquered the cities on the borders of the Hellespont, and the Athenians, animated by such success, again rejected the proposals of peace. At length Lysander, one of the ablest Spartan commanders, signally defeated the Athenian fleet at Ægospotamos, B. C. 405, and laid siege to Athens, which was compelled by famine to surrender. B. C. 404. The long walls and the fortifications of the Piræus were demolished. The Athenians were compelled to deliver up all their ships but twelve, to renounce their former possessions, and to submit to an oligarchy, established by Lysander. In this war, many noble families became extinct, many cities and territories were laid waste, and the whole Grecian nation was so debilitated, that universal dependence soon ensued. The history of this war is best related by Thucydides and Xenophon.

PELOPS; son of Tantalus, king of Lydia. A fable, which Pindar considers blasphemous, relates, that Tantalus once entertained the gods in his capital, Sipylus, and, to prove their omniscience, served up to them the body of his son Pelops. Jupiter discovered the trick, and ordered the limbs to be thrown again into the kettle, from which Clotho drew out the body alive, and supplied, with ivory, the shoulder, which had been eaten by Ceres. According to Pindar, Neptune carried the beautiful Pelops to the abode of Jupiter. When Tantalus had made himself unworthy of the society of the gods, Pelops was also sent back to the dwellings of men. He went from Lydia to Greece, became a suitor of the beautiful Hippodamia (q. v.), and obtained the bride, with a kingdom. Peloponnesus received its name from him. Of his sons, Atreus and Thyestes are most celebrated. After death Pelops received divine honours, and a temple was built to him in the grove at Olympia.

PELVIS; the lower part of the cavity of the abdomen in men and animals. In the infant it consists of many pieces, but, in the adult, it is composed of four bones, so united as not to admit of motion on each other, and is open above and below, wide at its upper part and contracted at its inferior aperture. The outside is roundish, the upper part broader, the lower narrower. The whole pelvis is movable upon the thighs; the hip bone is therefore raised, in walking, on that side which is supported by the thigh: on the contrary, it sinks immediately with the trunk on that side on which the foot is raised and advanced. The walls of the cavity of the pelvis are even, smooth, and covered with flesh. A line drawn through the middle of the pelvis, divides it into two parts, one of which is called the *upper* or *larger*, the other the *lower* or *smaller* one. In well-formed persons of a middle size, the diameter of the great pelvis, or the distance from one hip bone to the other, is, in the male sex, about nine, in the female about eleven inches. The superior size of the female pelvis is intended to assist gestation and parturition. It is evident, that the pelvis of men must have, on account of their erect figure, a different direction from that of animals. The pelvis contains a part of the small intestines, the rectum, the bladder, the internal organs of generation, the large nerves and blood-vessels of the lower limbs, and many absorbent vessels, with their glands. Its office is to give steadiness to the trunk, to connect it with the lower extremities by a safe and firm junction, to form the centre of all the great motions of the body, and to give support to the gravid uterus.

PEN; a Celtic word signifying *head, summit;* hence *Pennine Alps, Apennines,* &c.

PEN, WRITING-PENS. It is well known that the ancients employed a certain reed, the nature of which is not precisely ascertained, for writing. The reeds were split, and shaped to a point like our quills. When goose-quills first came into use, or who first borrowed from the emblem of folly the instruments of wisdom, is not known. It has been asserted, that quills were used for writing as early as the fifth century, according to the history of Constantius. The oldest certain account is a passage of Isidore, who died 636 A. D., and who, among the instruments employed for writing, mentions reeds and feathers. There exists, also, a poem on a pen, written in the same century, and to be found in the works of Adhelm, the first Saxon who wrote in Latin. Alcuin, the friend and teacher of Charlemagne, mentions writing-pens in the eighth century. After that time, proofs exist which put the question of their use beyond dispute. Mabillon saw a manuscript gospel of the ninth century, in which the evangelists were represented with pens in their hands. *Calami* properly signify the *reeds* which the ancients used in writing. Modern authors often use the word as a Latin term for pens, and it is probable that the same was employed to signify quills before the time of Isidore. Reeds were used for a considerable time after the introduction of writing-pens. In convents they were retained a long time for the initials only. By some letters of Erasmus to Reuchlin, it appears that the former received three reeds from the latter, and expressed a wish that Reuchlin, when he procured more, would send some of them to a certain learned man in England. Quills, for some reason, were, about the year 1433, extremely rare in Venice. We learn from the familiar letters of learned men of that time, that they were equally troubled by the rarity of quills and by the difficulty of making good ink. Of late, steel pens have been much used and improved, and for certain purposes, as for signing bank notes, to make the signatures uniform, they appear well adapted; as also for people who cannot make pens; but, on the whole, the quill affords a much easier and handsomer chirography.

PENAL LAW. See *Criminal Law.*

PENANCE; every penalty borne for the expiation of an offence. In the early Christian church, this ancient judicial principle was transferred to religious penance, that is, to the atonement which the sinner has to make, for his trespasses, to God and the church. According to the doctrine of the Protestants, it is not among the sacraments. This doctrine considers compunction and faith as the only elements of repentance and reformation. Penance is considered by the Catholic church a sacramental institution. The conditions for the necessary transition from bad to good, are a humble consciousness of guilt. The conversion itself is a change in the soul of man, effected by the power of God, but necessarily connected with an exterior alteration. The power of forgiving sins, in the literal sense of the word, say the Catholics, has been transferred by Christ to the apostles, and to the church; but the latter can forgive the sins only of the truly repentant and converted sinner. To bring him to the knowledge of himself, the church has established confession; to calm his conscience, absolution; for the instruction and discipline of the converted, she inflicts penance, as a satisfaction to his own conscience and to God. Confession was not invented by Innocent III., but only enjoined by him at least once a year. It is followed by absolution, according to the authority transmitted to the church, and by the imposition of such penances as are necessary to free from the consequences of sin. The council of Trent declares, in sess. xiv. c. 8, that satisfaction for sin is effected only by Christ, and it is left for the individual to bring forth fruits worthy of repentance. Days of penance and fasting are holy days, which, in certain countries, are fixed annually, or after general calamities, for the purpose of a general expression of penitence, or with the view of appeasing the anger of the Deity. The great day of fasting among the Jews is the Long Night. The Christians imitated these fast-days.

PENATES; the private or public gods of the Romans; in the former sense, they resembled the Lares, with whom they are often confounded. Not only every house, but every city, had its Penates, and the latter were the public gods. The most celebrated at Rome were those that protected the empire. These were brought into Italy by Æneas, together with Vesta and her eternal fire. According to Varro and Macrobius, the Penates were rude images of wood or stone, furnished with a spear; and generals, on their departure, and consuls, pretors, and dictators, when they retired from office, sacrificed victims before them.

PENCIL; an instrument used by painters for laying on their colours. Pencils are of various kinds, and made of various materials; the larger sorts are made of boar's bristles, the thick ends of which are bound to a stick, large or small, according to the uses they are designed for; these, when large, are called *brushes*. The finer sorts of pencils are made of camels', badgers', and squirrels' hair, and of the down of swans; these are tied at the upper end with a piece of strong thread, and enclosed in the barrel of a quill. Good pencils, when drawn between the lips, come to a fine point.

Lead Pencils. See *Plumbago.*

Pencil of Rays; a number of rays diverging from some luminous point, which, after passing through a lens, converge again to a point.

PENDANT. Two paintings or prints of equal dimensions, which are attached in corresponding positions to the same wall, are called *pendants* to each other.

PENDANT, or PENNANT; a sort of long narrow banner displayed from the mast-head of a ship-of-war, and usually terminating in two ends or points, called the *swallow's-tail.* It denotes that a vessel is in actual service.

Broad pendant is a kind of flag terminating in one or two points, used to distinguish the chief of a squadron.

Pendant is also a short piece of rope, fixed on each side, under the shrouds, upon the heads of the main and fore masts.

PENDULUM, in dynamics, is a simple ponderous body, so suspended by a flexible cord from an axis of suspension, that it is at liberty to vibrate by the action of its own gravity alone, when it is once raised, by any external force, to the right or left of its quiescent position; and, in demonstrating the theory of its motion, mathematicians are obliged to assume, that there is no rigidity in the cord, no friction at the axis of suspension, no resistance to motion made by the air, and no variation in the total length of the cord, arising from the variable temperature or moisture of the atmosphere; and if these assumptions were strictly correct, a pendulum, once put in motion, would continue to move, *ad infinitum*, without a further accession of any external force; but, when the pendulum is applied as the regulator of a clock, for which purpose it is admirably adapted, the assumptions which we have stated, require an equal number of mechanical corrections, of which the theory, simply considered, takes no notice. In horology, therefore, the pendulum must be considered not simply as a self-moving pendulous body, without any tendency to come to a state of rest, but as a body whose motion is perpetuated by repeated accessions of force in aid of its own gravity, and whose vibrations are rendered isochronal by a nice adaptation of mechanical contrivances, that prevent or remedy the influence of all natural impediments to uniform and uninterrupted motion. The first kind of pendulum (the theoretical) is called a *mathematical* or *simple* pendulum, the other the *physical* or *compound* pendulum. In the mathematical pendulum, the matter of the pendulous ball or bob is supposed to be collected into one point, so that the centres of gravity and of oscillation coincide.

The doctrine of the pendulum is of the highest importance, but, as it cannot be fully developed without the aid of mathematics, nor rendered clear without diagrams, we can state only some of the most obvious properties and circumstances connected with it. A pendulum, once put in motion, would never cease to oscillate in arcs, were it not for the friction at the point of suspension, and the resistance of the air. Neither of these circumstances can ever be avoided entirely, but their effect may be rendered comparatively slight by giving to the weight a lenticular shape, and suspending the rod on a sharp edge, on which it plays with very little friction. The times of the vibrations of a pendulum depend, 1. on the magnitude of the angle of elongation, viz. that angle by which the heavy body of the pendulum is removed from the vertical line; 2. upon the length of the pendulum; and 3. upon the accelerating power of gravity. If all these circumstances are perfectly equal in the case of two pendulums, they will perform an equal number of oscillations in the same time; but if there is a difference in either of the circumstances, the oscillations will differ immediately. Thus, if one pendulum is shorter than the other, and all the other circumstances equal, the shorter pendulum will move quicker than the longer. The law which has been found to exist is, that the lengths of the pendulums are in an inverse proportion to the squares of their oscillations; hence the times of the oscillations are inversely as the square roots of the lengths of the pendulums. Hence a pendulum which is four times as long as another, will vibrate with but half the rapidity, or the shorter pendulum will perform two oscillations whilst the larger performs but one.

The pendulum does not perform its oscillations in equal times in all parts of the earth. This is owing to the third of the circumstances enumerated above, upon which the oscillations depend. The gravity, or, what is the same thing, the power of attraction in the earth, does not operate every where with equal force on the pendulum, which, therefore, in some parts of the earth, oscillates more slowly than in others. The cause of this lies in the centrifugal force, or in the diminution of the power of gravity caused by it. This becomes more perceptible the nearer the place where the pendulum is observed is to the equator. (See *Earth.*) At the equator, therefore, a pendulum vibrating seconds must be somewhat shorter than at a distance from it. The length of a seconds pendulum at the equator is, according to Biot, 39.011684 inches; in latitude 45°, 39.116820, in 90°, 39.221956. If the globe were a perfect spheroid, the meridians would be perfect ellipses, and in such case the length of seconds pendulums would immediately afford a basis for a calculation of the length of the degrees in the various latitudes; but actual measurements have shown that the meridians contain some irregularities, from which it has been justly concluded, that the earth has not a perfectly regular form, but deviates more or less from the shape of a sphere. We can, therefore, properly draw conclusions from the oscillations of the pendulum respecting the power of gravity only, and not respecting the form of the earth. Besides the friction of the rod, &c., and the resistance of the air, there are also other circumstances which influence the oscillations of the pendulum. These are the changes of heat and cold. Heat lengthens the rod of the pendulum, cold contracts it; hence common pendulum clocks go much quicker in winter; and the change of temperature in rooms which are heated during the day influences them considerably. Many contrivances have been devised for overcoming this inconvenience. One is, by making pendulums of the form of a gridiron, consisting of several parallel bars of different metals, so connected that the effect of one set of them counteracts that of the others. These have been very successful. Rods are sometimes made of certain kinds of wood, well seasoned, which are little influenced by the weather. Astronomical clocks of the present day do not err to the amount of one beat or oscillation of the pendulum in a year. A common clock is merely a pendulum with wheel-work attached to it, to record the number of vibrations, and with a weight or spring to counteract the retarding effects of friction and the resistance of the air. Huygens, who developed the doctrine of the pendulum, which had been treated already by Galileo, first applied it to clocks, and thus became the inventor of the pendulum clock (in 1656). (See *Clock*.) For the application of pendulums to Horology, see Berthoud's *Essai sur l'Horlogerie* (Paris, 1763, 2 vols., 4to).—See, also, Biot's treatise *Sur la Longueur du Pendule à Secondes*, in the third volume of his *Traité d'Astronomie Physique* (second edition, Paris, 1810).—See, also, Bode's *Anleitung zur Kenntniss der Erdkugel* (second edition, Berlin, 1803).

PENELOPE. See *Ulysses*.

PENGUIN. See *Pinguin*.

PENITENTIARIES. See *Prisons*.

PENN, WILLIAM, was born in London, in 1644. He was the only son of William Penn, of the county of Wilts, vice-admiral of England in the time of Cromwell, and afterwards knighted by king Charles II., for his successful services against the Dutch. He appears to have been seriously inclined from his youth, having imbibed religious impressions as early as his twelfth year, which were soon afterwards confirmed by the ministry of Thomas Loe, an eminent preacher among the people called Quakers, then newly associated in religious fellowship. In his fifteenth year, he was, notwithstanding, entered as a gentleman commoner of Christ-church, Oxford, where, meeting with some other students who were devoutly inclined, they ventured to hold private meetings among themselves, wherein they both preached and prayed. This gave great offence to the heads of the college, by whom these zealous tyros were at first only confined for non-conformity; but persisting in their religious exercises, they were finally expelled the university. On his return home, his father endeavoured in vain to divert him from his religious pursuits, as being likely to stand in the way of his promotion in the world; and at length, finding him inflexible in what he now conceived to be his religious duty, beat him severely, and turned him out of doors. Relenting, however, at the intercession of his mother, and hoping to gain his point by other means, he sent his son to Paris, in company with some persons of quality; whence he returned so well skilled in the French language, and other polite accomplishments, that he was again joyfully received at home. After his return from France, he was admitted of Lincoln's Inn, with a view of studying the law, and continued there till his twenty-second year, when his father committed to him the management of a considerable estate in Ireland,—a circumstance which unexpectedly proved the occasion of his finally adhering to the despised cause of the Quakers, and devoting himself to a religious life. At Cork, he met again with Thomas Loe, the person whose preaching had affected him so early in life. At a meeting in that city, Loe began his declaration with these penetrating words, "There is a faith that overcomes the world, and there is a faith that is overcome by the world;" which so affected Penn, that from that time he constantly attended the meetings of the Quakers, though in a time of hot persecution. He was soon afterwards, with many others, taken at a meeting in Cork, and carried before the mayor, by whom they were committed to prison; but young Penn was soon released, on application to the earl of Orrery, then lord-president of Munster. His father, being informed of his conduct, remanded him home; and, finding him unalterably determined to abide by his own convictions of duty, in respect to plainness of speech and deportment, he would have compounded with him, if he would only have consented to remain uncovered before the king, the duke (afterwards James II.), and himself. Being disappointed in this, he could no longer endure the sight of his son, and a second time drove him from his family. Yet after a while, becoming convinced of his integrity, he permitted him to return; and though he never openly countenanced him, he would use his interest to get him released, when imprisoned for his attendance at religious meetings. In the year 1668, in the twenty-fourth year of his age, Penn first appeared as a minister and an author; and it was on account of his second essay, entitled The Sandy Foundation Shaken, that he was imprisoned in the Tower, where he remained seven months, during which time he wrote his most celebrated work, No Cross, no Crown, and finally obtained his release from confinement by an exculpatory vindication, under the title of Innocency with her open Face. In 1670, the meetings of dissenters were forbidden, under severe penalties. The Quakers, however, believing it their religious duty, continued to meet as usual; and when forcibly kept out of their meeting-houses, they assembled as near to them as they could in the street. At one of these meetings, William Penn preached to the people thus assembled for divine worship; for which pious action he was committed to Newgate, and, at the next session at the Old Bailey, was indicted for "being present at, and preaching to, an unlawful, seditious, and riotous assembly." He pleaded his own cause, though menaced by the recorder, and was finally acquitted by the jury; but he was, nevertheless, detained in Newgate, and the jury fined. Sir William died this year, fully reconciled to his son, to whom he left a plentiful estate, taking leave of him in these memorable words: "Son William, let nothing in this world tempt you to wrong your conscience. So will you keep peace at home, which will be a feast to you in a day of trouble." Shortly after this event, Penn travelled, in the exercise of his ministry, into Holland and Germany. In the year 1672, he married Gulielma Maria Springett, whose father (Sir William) having been killed at the siege of Bamber, in the civil wars, her mother had married Isaac Penington of Chalfont, in Bucks, an eminent minister and writer among the Quakers. In 1677, in company with George Fox and Robert Barclay, the celebrated apologist, he again set sail on a religious visit to

Holland and Germany, where he and his friends were received by many pious persons as the ministers of Christ, particularly at Herwerden, by the princess Elizabeth of the Rhine, daughter of the king of Bohemia, and grand-daughter of James I. of England.

The persecutions of dissenters continuing to rage, notwithstanding their repeated applications to parliament for sufferance and protection, William Penn now turned his thoughts towards a settlement in the new world, as a place where himself and his friends might enjoy their religious opinions without molestation, and where an example might be set to the nations of a just and righteous government. "There may be room there," said he, "though not here, for such a holy experiment." He, therefore, in 1681, solicited a patent from Charles II., for a province in North America, which the king readily granted, in consideration of his father's services, and of a debt still due to him from the crown. Penn soon after published a description of the province, proposing easy terms of settlement to such as might be disposed to go thither. He also wrote to the Indian natives, informing them of his desire to hold his possession with their consent and good-will. He then drew up the Fundamental Constitution of Pennsylvania, and the following year he published the Frame of Government, a law of which code held out a greater degree of religious liberty than had at that time been allowed in the world. "All persons living in this province, who confess and acknowledge the One Almighty and Eternal God to be the Creator, Upholder, and Ruler of the world, and that hold themselves obliged in conscience to live peaceably and justly in civil society, shall in no wise be molested or prejudiced for their religious persuasion or practice, in matters of faith and worship; nor shall they be compelled at any time to frequent or maintain any religious worship, place, or ministry, whatsoever." Upon the publication of these proposals, many respectable families removed to the new province; the city of Philadelphia was laid out upon the banks of the Delaware; and, in 1682, the proprietor visited his newly-acquired territory, where he remained about two years, adjusting its concerns, and establishing a friendly intercourse with his colonial neighbours; during which period no less than fifty sail arrived with settlers from England, Ireland, Wales, Holland, and Germany.

Soon after Penn returned to England, king Charles died; and the respect which James II. bore to the late admiral, who had recommended his son to his favour, procured to him free access at court. He made use of this advantage to solicit the discharge of his persecuted brethren, 1500 of whom remained in prison at the decease of the late king. In 1686, having taken lodgings at Kensington, to be near the court, he published a Persuasive to Moderation towards Dissenting Christians, &c., humbly submitted to the king and his great council, which is thought to have hastened, if it did not occasion, the king's proclamation for a general pardon, which was followed the next year by his suspension of the penal laws. At the revolution in 1688, Penn's intimacy with the abdicated monarch created suspicions, of which he repeatedly cleared himself before authority, until he was accused by a profligate wretch, whom the parliament afterwards declared to be a cheat and an impostor. Not caring to expose himself to the oaths of such a man, he withdrew from public notice till 1693. In that year, through the mediation of his friends at court, he was once more admitted to plead his own cause before the king and council, and was again acquitted of all suspicion of guilt. The most generally known production of his temporary seclusion bears the title of Fruits of Solitude, in Reflections and Maxims relating to the Conduct of Human Life. Not long after his restoration to society, he lost his wife, Gulielma, to which he said all his other troubles were as nothing in comparison. He travelled, however, the same year, in the west of England, and in the next prosecuted an application to parliament for the relief of his friends, the Quakers, in the case of oaths. In the year 1696, he married a second wife, Hannah, the daughter of Thomas Callowhill, an eminent merchant of Bristol, and soon after buried his eldest son, Springett, a remarkably pious and promising youth. In 1698, he travelled in Ireland, and resided the following year at Bristol. In 1699, he again sailed for Pennsylvania, with his second wife and family, intending to make his province the place of their future residence; but advantage was taken of his absence to undermine proprietary governments, under colour of the king's prerogative, and he thought it necessary to return to England again in 1701. After his arrival, the measure was laid aside, and Penn became once more welcome at court, on the accession of queen Anne. In 1710, finding the air near the city to disagree with his declining health, he took a handsome seat in Buckinghamshire, at which he continued to reside during the remainder of his life. In the year 1712, he had three distinct fits of the apoplectic kind. The last of these so impaired his memory and understanding as to render him ever after unfit for public action; but he continued to deliver, in the meeting at Reading, short, but sound and sensible expressions. In 1717, he scarcely knew his old acquaintance, or could walk without leading. He died in 1718. The writings of Penn (first published in two volumes folio) bespeak his character as a Christian and a philanthropist. Of his ability as a politician and legislator, the prosperity of Pennsylvania is a lasting monument.

PENNALISM is the name for the torments and impositions to which the elder students in German universities used to subject the younger ones, called *Pennale* (pen-cases), afterwards *foxes*. This abuse was carried to a great extent; and books written 200 years ago exhibit a real barbarity of manners in this respect. In 1661 and 1663, the German empire thought it necessary to enact laws against *pennalism*. It corresponds to the English *fagging;* and, though few traces of it exist at present in Germany, it is still customary, in most schools, to greet the "foxes" (scholars who ascend from a lower class into a higher) with a sound beating; and we find in Byron's Life, by Moore, to what an extent fagging has been carried in England. It is said that *pennalism* originated in the Italian universities (Bologna, &c.), which is very probable, as the students at these universities kept together in "nations," in order to protect each other, and young students went with recommendations to the *senior* of those nations. But in those rude times, the weak, who wanted protection, were every where exposed to the brutal abuse of the stronger. Among mechanics, apprentices, and young journeymen, were subjected to similar discipline,—a consequence of the rude feudalism which had penetrated every part of society. Others derive these practices from the chapters of the clergy, among whom every new canon was obliged to pay a certain sum for a banquet on his entrance; and it is a well known fact, that many of the customs, songs (decent and indecent), &c. of German students, originated in the chapters and monasteries. See *Feast of Fools*.

PENNANT, THOMAS, an English naturalist and antiquary, was born at Downing, in Flintshire, in 1726, and studied at Oxford. His first production was an account of an earthquake felt in Flintshire, April 2, 1750, which appeared in the Philosophical Transactions in 1756; and, the following year, he was chosen a member of the royal society of Upsal, through the influence of Linnæus. He commenced, in 1761, a body of British Zoology, which first appeared in four vols. folio, and was republished in quarto and octavo, and translated into German by C. Theoph. Murr. This work was followed by his Indian Zoology (1769); Synopsis of Quadrupeds (1771); Genera of Birds (1773); History of Quadrupeds (1781); Arctic Zoology (1786); and Index to Buffon's Natural History of Birds (1787). In 1765, Mr Pennant took a journey to the continent, when he visited Buffon, Haller, Pallas, and other eminent foreigners. He was admitted into the royal society in 1767; and, in 1769, he undertook a tour into Scotland, of which he published an account in 1771, and a second volume appeared in 1776, relating to a second tour in the same country, and a voyage to the Hebrides. In 1778, he published a tour in Wales; to which was afterwards added, in another volume, a Journey to Snowdon. He produced, in 1782, a narrative of a Journey from Chester to London; and in 1790 appeared his amusing work, An Account of London (4to). In 1793, he professedly took leave of the public in a piece of autobiography,—the Literary Life of the late Thomas Pennant; but he subsequently committed to the press a History of Whiteford and Holywell, in his native county. He died in 1798. After his death appeared Outlines of the Globe (4 vols., 4to), forming a portion of a very extensive undertaking, which was never completed, and some other posthumous publications. His skill in the selection of interesting subjects for discussion, and his felicity of illustration, attracted admirers, rather than the extent of his researches, or the profundity of his observations.

PENNSYLVANIA, one of the United States of America, extends, as now limited, from N. lat. 39° 43′, to N. lat. 42° 16′, and from 74° 35′, to 80° 31′ W. lon. from Greenwich. It is bounded north by New York; east by the river Delaware, which separates it from New Jersey; south-east by the state of Delaware; south by Maryland and part of Virginia, and west by the latter and the state of Ohio. It lies nearly in the form of a parallelogram. Darby, in his Geographical View, states that its greatest length is due west from Bristol, on the Delaware river, to the eastern border of Ohio county, in Virginia, through 5° 56′ of longitude, along N. latitude 40° 9′. This distance, on that line of latitude, is equal to 315 American statute miles. The greatest breadth is 176 miles, from the Virginia line to the extreme northern angle, on lake Erie; and the mean breadth, 157. The same writer calculates the area at above 47,000 square miles, and 30,080,000 statute acres.

The original Swedish colony came over in 1638 under the government and protection of Sweden. The Dutch and the Finns had also settled on the Delaware, before the British conquest of the New Netherlands, in 1664. In 1682, William Penn founded a colony, having previously obtained a charter from Charles II., which put him in possession of the soil and government of the country. This charter was granted in consideration of an unsettled pecuniary account between the government and the estate of Penn's father. The emigration from Wales into Pennsylvania was as early as 1683. The emigrants purchased a large body of land, and called the several settlements after favourite places in Wales. The Indian right was respected by William Penn, and his sense of justice induced him to make an equitable purchase from the aborigines, notwithstanding his charter; and the same policy was pursued by the constituted government after the revolution, as the state of Pennsylvania made new purchases from the native proprietors at a fair price, and in open treaty, in 1784. Though the state of Pennsylvania might have considered the proprietary claims as a royalty, to which the independent government could lawfully succeed, yet, as a peculiar acknowledgment of the merits and claims of William Penn and his family, by an act of the legislature, the sum of £130,000 sterling, together with a confirmation of title to all the manor lands, which were ten per cent. on all surveyed lands in the province, was to be offered to the Penn family, which offer was by them accepted. This was a liberal compensation for revolutionary losses, considering that, in the year 1712, William Penn offered to the queen of England the government and soil of the province for the sum of £12,000, payable in four years. This was certainly owing to his pecuniary embarrassments; and although he actually entered into a contract for this purpose, yet an apoplectic attack rendered him incapable of perfecting the legal forms. The litigated question with the state of Connecticut touching the right of territory in the northern part of the state, was depending from the year 1750 until a few years since, when the public and private rights of soil were settled in favour of Pennsylvania, under conciliations and restrictions, determined by special acts of the Pennsylvania legislature and the decisions of the supreme court of the United States. The seat of the state government was transferred from Philadelphia to Lancaster in the year 1799, and the progress of improvement and population caused it, in 1812, to be removed to Harrisburg, where handsome buildings are erected for the accommodation of the legislature and the officers of the government.

The whole state is divided into 52 counties, viz. Adams, Alleghany, Armstrong, Beaver, Bedford, Berks, Bradford, Bucks, Butler, Cambria, Centre, Chester, Clearfield, Columbia, Crawford, Cumberland, Dauphin, Delaware, Erie, Fayette, Franklin, Green, Huntingdon, Indiana, Jefferson, Juniatta, Lancaster, Lebanon, Lehigh, Luzerne, Lycoming, M'Kean, Mercer, Mifflin, Montgomery, Northampton, Northumberland, Perry, Philadelphia, Pike, Potter, Schuylkill, Somerset, Susquehannah, Tioga, Union, Vinango, Warren, Washington, Wayne, Westmoreland, York. There are three incorporated cities in this state—Philadelphia, Pittsburg, and Lancaster. There are very few counties which have not a borough and many populous towns, the most considerable of which are Harisburg, Reading, Easton, Carlisle, York, Chambersburg, Brownsville, Washington, &c. By an estimate of the population in 1782, it was supposed to be 330,000. By the census of 1790, it was ascertained to be 434,373. In 1800, it was 602,545. In 1810, it was 810,091. In 1820, it was 1,049,458; and in 1831, it was 1,347,672.

The government of Pennsylvania consists of three branches—legislative, executive, and judicial. The legislature consists of a senate and a house of representatives. By the present constitution, the house of representatives cannot exceed 100, and are chosen annually. The senate, whose number cannot be more than one third of the lower house, are chosen for four years, one fourth of their body annually; at this period both branches are full. The governor is elected for three years, but cannot hold the office more than nine years in twelve. These elections are all by the people and by ballot. All judicial officers are appointed by the governor during good behaviour, and are removable by address of both houses or by impeachment.

The inhabitants are principally descended from the English, Welsh, Irish, Scotch, and Germans, also French, Swedes, and a few Dutch. The language is generally a pure English, but, in many counties the German prevails to a considerable extent. The character of the Pennsylvanians is somewhat diversified by difference of extraction and various modes of education, but this is chiefly in minor points. The facilities of receiving education are great. There is a university in Philadelphia, and colleges have been established at Carlisle, Canonsburg, Washington, Pittsburg, and Meadville, and provision has been made by the legislature for the establishment of an academy in every country in the state. There are also flourishing Moravian schools at Bethlehem, Nazareth and Litiz, and, by the will of the late Stephen Girard, of Philadelphia, a fund of 2,000,000 dollars (to be augmented, if necessary, by rents of real property, and residuary personal estate) has been appropriated for the establishment of a college for the education of orphan children. The different religious denominations in Pennsylvania, are Presbyterians, Methodists, German Calvinists, German Lutherans, Friends, Episcopalians, Baptists, Roman Catholics, Seceders, Covenanters, Universalists, Swedenborgians, Jews, and Unitarians.

With regard to the face of the country, the mountains strike the eye at the first glance on a map, as the most prominent natural features. The Appalachian system in the United States generally extends in a direction deviating not very essentially from south-west to north-east, but in Pennsylvania, the whole system is inflected from that course, and traverses the state in a serpentine direction. Towards the south boundary, the mountains lie about north-north-east, gradually inclining more eastwardly as they penetrate northward, and in the central counties, many of the chains lie nearly east and west. But, as they extend towards the northern border of the state, they again gradually incline to the north-east, and enter New York and New Jersey in nearly that direction. The principal ridges on the east side of the Susquehannah, are the Kittatinny or Blue mountains, behind which, and nearly parallel to them, are Peters, Tuscarora, and Nescopeck mountains. On the west side of the Susquehannah are the Kittatinny ridges, comprising the North or Blue, the Horse and the Tuscarora mountains, Sherman's hill, Sideling hill, Ragged, Great Warrior's, Tussey's, and Wills's mountains; then the great Alleghany ridge, which, being the largest, gives name to the whole; and west of this are the Chestnut ridges, including the Laurel hill. Between the Juniatta river and the west branch of the Susquehannah are Jack's, Tussey's, Nittany, and Bald Eagle mountains. The mountain area has been estimated at 6750 square miles, or very nearly one seventh part of the superficies of the state. Some of these mountains admit of cultivation almost to their summits, and the valleys between them are often of a rich black soil, suited to the various kinds of grass and grain. The other parts of the state are generally level or agreeably diversified with hills and vales. The principal rivers are the Delaware, Susquehannah, Schuylkill, Lehigh, Alleghany, Monongahela, Ohio, Juniatta, Youhiogeny, and Clarion, formerly designated as *Toby's creek*. Besides these main streams, Pennsylvania is watered by numerous large creeks and rivulets, to as great a degree as the same extent of country in any part of the United States. This state deserves credit for her numerous improvements in turnpike roads, canals, railroads, and bridges, which have been constructed in a superior style of excellence and durability. The first turnpike road in the United States was made in Pennsylvania.

The soil of Pennsylvania is much diversified; in some parts it is barren, but a great proportion of it is fertile, and a considerable part very excellent. West of the mountains, the soil of the first quality is a deep black mould, equal in fertility to any part of the United States. Wheat is the most important article of produce. Indian corn, rye, buckwheat barley, oats, flax, hemp, beans, peas, and potatoes are extensively cultivated. Apples, cherries, pears, peaches, and plums are abundant. The trees natural to the soil are hemlock, pine, hickory, walnut, wild cherry, locust, maple, chestnut, mulberry, oak, gum, sassafras, elm, and poplar. The *magnolia glauca* grows in low grounds, and the *acuminata* attains to a great height among the western mountains. Grapes are common, and some of them, mellowed by frost, with the addition of sugar, make a pleasant wine. The wild plum and crab apple grow in abundance. Foreign grapes have in some counties been cultivated to advantage, and wine and brandy, of good quality, have been made. This article of manufacture has hitherto been a matter of experiment only. The sugar-maple, in the western and northern parts of the state, is abundant, and the inhabitants generally make therefrom a sufficient quantity of sugar for home consumption. Iron ore is distributed, in large quantities, in many parts of the state, and the manufacture of iron from the ore, through the furnace, the forge, the foundery, the rolling and slitting mill, the nail cutting machine, up to the finest cutlery, is carried on to a greater extent than in any other state in the Union. Copper, lead, and alum appear in some parts of the state. Limestone and marble, of the finest quality for the purposes of architecture and statuary, abound in various parts of the state. In the middle counties, anthracite, and in the western, bituminous coal, is found in great abundance.

This state is famous for its breed of draught horses, and nature has abundantly supplied the forests with game. Deer, turkeys, pheasants, and partridges are numerous. Wild ducks are found on almost every stream. Wild geese, swans, and pigeons are migratory, and frequently found in large flocks. Singing birds of various notes and plumage are common. In the eastern rivers are found rock-perch, bass, shad, and herring, which come from the sea in large shoals. In the western waters there is a species of catfish, weighing from fifty to a hundred pounds; likewise pike, of an enormous weight and size, are found. Sturgeon is common to both sections of the state. In the smaller streams, trout, pike, chub, sun-perch, mullet, catfish, and white salmon are found in their several seasons. Bears, panthers, wild cats, foxes, wolves, beavers, otters, and raccoons are more or less common, in proportion to the progress of settlement and cultivation. Rabbits and squirrels are still abundant. In the low grounds are found minks, muskrats, and opossums. Of the numerous tribe of snakes, the bite of the rattlesnake and copperhead alone is deadly.

The Pennsylvania farmer lives as comfortably as any one of his station in any part of the world. Commodious farm houses of stone or brick, extensive barns and farm buildings, show the agricultural prosperity of the state. Log and frame houses are common in the new settled country. In the towns and villages is a considerable proportion of brick and stone houses.

Pennsylvania exceeds all the other states in the variety and extent of her manufactures, some of which are of superior excellence. Those of iron have been mentioned. The various fabrics from wool and cotton give ample employment to the capitalist and the artisan. All the necessaries of life, and many of its luxuries, are to be found in this state, the produce of its soil and the labour of its citizens. For the exports of this state, see articles *Philadelphia*, and *Pittsburg*.

PENNSYLVANIA UNIVERSITY. See *Philadelphia*.

PENN TOWNSHIP; a small township in Philadelphia county, Pennsylvania. This place was selected by the late Mr Girard, for the establishment of a school for orphans. The site is about two miles from the old court-house in Philadelphia.

PENNY. See *Sterling Money*.

PENNY POST. See *Posts*.

PENNYROYAL; a species of mint (*mentha pulegium*), formerly in considerable repute as a medicine, but now almost totally neglected. See *Mint*.

PENOBSCOT; the largest river of Maine, United States of America. The western and principal branch rises in the western part of the state, and unites with the eastern branch fifty-four miles north-east of Bangor. After the junction, it runs south by west, till it flows into the head of Penobscot bay, between the towns of Penobscot and Prospect. It is navigable for ships to Bangor, where the tide terminates, fifty-two miles north of Owl's Head, at the entrance of the bay. Many towns on the banks of the Penobscot are beautiful and flourishing.

PENSACOLA, the capital of West Florida, is situated on a bay of the same name, in lat. 30° 28′ N., and lon. 87° 12′ W. The shore is low and sandy, but the town is built on a gentle ascent. It is in the form of a parallelogram, and the length is nearly a mile. Only small vessels can approach the town, but the bay is one of the most safe and capacious in the gulf of Mexico. It has been selected as a naval station and depot. A stream of fresh water runs through the town. It is regarded as comparatively a healthy place. The present population may be a little more than 2000.

PENSIONER; a person who receives a pension from government.

Grand Pensionary was the prime minister of the states of the province of Holland, who was called by them advocate-general of the province. He had no deciding voice in the assembly of the states, but only proposed the measures to be discussed. He collected the votes, drew up the reports, opened all memorials addressed to the states, transacted business with the foreign ministers, superintended the revenue and the maintenance of rights and privileges, and took care, in general, of the welfare of the province. He took part in the doings of the college of the counsellors, who exercised the sovereign power in the absence of the states, and was permanent deputy to the general estates of the United Netherlands. The influence of this first magistrate was very great in Holland, and, therefore, in all the Netherlands. His term of office was five years, after the lapse of which he was generally rechosen. The French revolution and its consequences put an end to this office; but Napoleon, in 1805, made a state-pensionary director of the republic. See *Schimmelpenninck*.

PENTAGLOT. See *Pentapla*.

PENTAMETER; a verse consisting of five feet. These feet are two spondees or dactyles, two dactyles and one spondee, which latter is so severed, that its first syllable follows the two first feet, and its last syllable concludes the verse. The final syllable may also be short. The scheme of the pentameter is, therefore, as follows:

$$\overset{\smile\ \smile}{-\ \ -}\ \Big|\ \overset{\smile\ \smile}{-\ \ -}\ \Big|\ -\ \Big|\ -\smile\smile\ \Big|\ -\smile\smile\ \Big|\ \overset{\smile}{-}$$

The ancient grammarians, who in this way make of the pentameter a verse of five feet can give no other reason for so doing, than there does not exist, as they say, any foot of one syllable. To the ear, however, and in its essential character, the pentameter is, as well as the hexameter, a verse of six parts, having in the third division a long syllable, and in the last a long or a short syllable, on which we dwell as long as on two long syllables, so that the pentameter requires as much time in pronouncing as the hexameter. The pentameter receives a gentle and lovely character from this double pause, by which it is distinguished essentially from the majestic hexameter. Ovid therefore says, that Cupid created it for his sport, by robbing the hexameter of two syllables. If used alone, the pentameter would become monotonous and tiresome; it is, therefore, never employed except alternately with the hexameter, which always precedes it. The metre thus composed of hexameters and pentameters was called by the ancients the *elegiac*, and each two verses a *distich*. (See *Distich*, and *Elegy*.) The character of the pentameter, however, is not exclusively gentle. It may be very poignant if used in an epigram, the point of which is made to coincide with the abrupt termination of the pentameter. A distich of Schiller compares the hexameter to the rising of the water of a fountain, and the pentameter to the falling back of the same.

PENTAPLA, PENTAGLOT; a Bible in five languages.

PENTATEUCH. See *Hebrew Language*, and *Moses*.

PENTECOST (from πεντηκοστη, the fiftieth); a Jewish festival, celebrated fifty days after the passover, in commemoration of the promulgation of the law on mount Sinai. It was also called the *Feast of Weeks*, because it occurred at the end of a week of weeks, or seven weeks. It is also a festival of the Christian church, occurring fifty days after Easter, in commemoration of the descent of the Holy Ghost on the disciples. It is called *Whitsuntide* by the English, according to some, from *White Sunday Tide* (time), because those who were newly baptized appeared at church in a white dress between Easter and Pentecost.

PENTELIC MARBLE. See *Marble*.

PENTHESILEA. See *Amazons*.

PENTHEUS; nephew of Cadmus, and his successor as king of Thebes. He opposed the introduction of the worship of Bacchus, and for this offence was torn to pieces by the Bacchantes, among whom were his own mother and sisters, acting, probably, under the direct influence of the god, like the rioters in the late outrages at Bristol, after they had broken open the wine-cellars of the town-house.

PENUMBRA. See *Eclipse*.

PEON, in the language of Hindoostan; a foot-soldier, armed with sword and target. In common use, the word denotes a footman so armed, employed to run before the palanquin. *Piada* is the original word, of which *peon* is a corruption.

PEONY. See *Pæony*.

PEPE. See *Naples and Sicily, Revolution of.*

PEPLUM. See *Panathenæum*.

PEPPER (*piper*); an extensive genus of plants, constituting a distinct natural family—the *piperaceæ*. The species are mostly succulent, perennial, herbaceous, or shrubby, often climbing, dichotomous, and jointed. The leaves are very simple, and sometimes peltate, smooth, veined, pubescent, or rough. The flowers are disposed in nearly filiform aments, are destitute of either calyx or corolla, and are separated by very small scales; these aments or spikes are opposite to the leaves, or terminal. The fruit consists of a berry containing a single seed. The species of pepper are almost strictly confined within the limits of the tropics, and abound particularly in the equatorial regions of America. A single species has been discovered in East Florida, inhabiting as far north as lat. 39°. They are inconspicuous, often insignificant plants, in their appearance, and present little variety in the shape of their leaves.

The *P. nigrum*, which furnishes the black pepper of commerce, is a native of the East Indies, and is besides cultivated on an extensive scale in that part of the globe. It is a climbing plant, and is supported on a pole or small tree planted for this purpose, which gives to the pepper grounds an appearance somewhat similar to the hop fields in northern climates. The stems are smooth and spongy, provided with broad, ovate, acuminate, seven-nerved leaves, and bearing little globular berries, which, when ripe, are of a bright red colour. The pepper of Malacca, Java, and especially of Sumatra, is the most esteemed. Formerly, the export of this article to Europe was exclusively in the hands of the Portuguese, but it is now open to all nations. Its culture has been introduced into the Isle of France, and thence into Cayenne and other parts of tropical America, where it has succeeded perfectly. Black pepper has always formed an extensive branch of commerce; the ancient Greeks and Romans were acquainted with it, and, at the present day, no spice is so generally used; the consumption is prodigious in all parts of the globe, but the southern Asiatics seem to employ it the most frequently.

White pepper is nothing more than the best and soundest of the berries, gathered when fully ripe, and deprived of their external skin, by steeping them in salt water for about a week, at the end of which time the skins burst; they are then dried in the sun, rubbed between the hands, and winnowed to separate the hulls; it is much less pungent than the entire berries.

The leaves of the *P. betel*, a native of the same parts of the globe, serve to enclose a few slices of the areca nut (thence commonly called *betel nut*), and a little shell lime, which substances together form a masticatory as much in use among these nations as is tobacco in Europe and America. It stains the saliva of a brick-red colour, and corrodes by degrees the substance of the teeth, but the consumption is, notwithstanding, prodigious, and it forms a very extensive branch of commerce.

The true cubebs is the berry of a third species of pepper *(P. cubeba)*, also from the same countries. The berries are globular, and about as large as those of the black pepper; they are tonic, stimulant, and carminative, and are frequently used medicinally by the Asiatics. We must not confound this with the tailed pepper, also called *cubebs*, which is the product of the *uvaria zeylanica*, an entirely different plant, although it is used for the same purposes. See *Cayenne Pepper*.

PEPPERELL, Sir William, a lieutenant-general in the service of the British king before the American revolution, was born in the district of Maine (Massachusetts), and, about the year 1727, was chosen one of his majesty's council, to which he was annually re-elected until his death—a period of thirty-two years. He possessed a vigorous frame, and much energy and firmness of character, which rendered him of great utility to a country exposed to a ferocious enemy. He was bred a merchant, but the principal portion of his time was spent in the discharge of the duties of a soldier. He rose to the highest military honours. When the expedition against Louisburg was contemplated, he was commissioned by the governors of New England to command the troops, and, investing the city in the beginning of May, 1745, soon forced it to capitulate. To reward his services, the king created him a baronet of Great Britain. He died at his seat in Kittery, Maine, July 6, 1759, aged sixty-three. He was distinguished for his social qualities.

PEPPERMINT. See *Mint*.

PEPYS, Samuel, secretary to the admiralty in the reigns of Charles II. and James II., was born at Brampton, in Huntingdonshire, and educated at Cambridge. He early acquired the patronage of Montagu, afterwards earl of Sandwich, who employed him as secretary in the expedition for bringing Charles II. from Holland. On his return, he was appointed one of the principal officers of the navy. In 1673, when the king took the admiralty into his own hands, he appointed Mr Pepys secretary to that office. He was employed under lord Dartmouth, in the expedition against Tangier, and often accompanied the duke of York in his naval visits to Scotland, and coasting cruises. On the accession of William and Mary, he published his Memoirs relating to the navy for ten years preceding, and led a retired life from this time till his death, in 1703. He was president of the royal society for ten years. He left a large collection of manuscripts to Magdalen college, Oxford, consisting of naval memoirs, prints, and five large folio volumes of ancient English poetry, begun by Selden, and carried down to 1700, from which the Reliques of Ancient English Poetry, by doctor Percy, are, for the most part, selected. His Diary affords a curious picture of the dissolute court of Charles II.

PERA; a suburb of Constantinople, connected with the suburb of Galata, and formerly the quarter of the principal Greeks, Armenians, Jews, and Franks, except the French who resided in Galata. There were here four Greek churches, and one Roman Catholic, and some monasteries. The Christian ambassadors also resided here, and the European style of dress and living prevailed here; it was therefore called by the Turks *Swine's Quarter*. It was almost entirely destroyed by fire in August, 1831. The palaces of the Austrian and Swedish missions escaped.

PERCEVAL, Spencer, second son of John Perceval, earl of Egmont, born 1762, received his education at Harrow, and Trinity college, Cambridge, of which he became a member about the year 1775. On quitting the university, he studied law. He soon distinguished himself as a sound constitutional lawyer, and obtained a silk gown. In 1801, he became solicitor-general, and, in 1802, attorney-general. On the formation of the new ministry, in 1807, after the death of Mr Fox, he was appointed chancellor of the exchequer. In this post he continued till May 11, 1812, when, while in the act of approaching the door of the house of commons, a person named Bellingham, who had for some time previously presented a variety of memorials respecting some alleged ill treatment received in Russia, shot him dead, with a pistol, in the lobby. The assassin, who avowed that he had been waiting with the view of destroying lord Leveson Gower, the ambassador to the court of St Petersburg, made no attempt to escape, and was instantly arrested. Although a plea of insanity was set up by his counsel, he was found guilty, and executed on the 18th of the same month.

PERCUSSION LOCKS; a late and very useful invention. The percussion lock has no pan. In the place of the pan, a small tube projects horizontally from the side of the gun. In this tube another small tube stands perpendicularly. The cock, instead of being formed to hold a flint, is shaped somewhat like a hammer, with a hollow to fit upon the tube last mentioned. On this tube a little cap of copper is placed, in the bottom of which is a chemical mixture that kindles by percussion. This percussion is produced by the cock, which therefore requires a very strong spring. The powder is made in various ways, and of different materials; among others, of mercury, purified nitric acid, and spirit of wine freed from water. The copper caps in which this chemical powder is placed are two and a half lines long and two lines wide. Sometimes the powder is also formed in pills, and then a somewhat different contrivance is required to place the pills, covered with a little wax, to protect them from moisture, in the small tube. The advantages of a percussion lock are great: 1. Provided the spring of the cock is strong, and the chemical powder good, the gun cannot miss fire (as to the latter, the sportsman must choose a good chemist); while common locks are exposed to miss fire from many causes—bad flints, bad steel, bad priming, and weak springs. 2. The chemical powder explodes much more rapidly and forcibly than common powder, and therefore explodes the powder in the gun itself more forcibly, so as to produce a prompter and more effectual discharge. 3. The moisture of the air has hardly any influence: in a violent rain, the lock is as sure to give fire as in the driest day. 4. The danger of an unintentional discharge is avoided: as long as the copper cap is not placed on the little tube, the gun cannot go off, even if the cock is snapped by mistake; while, with other guns, there is always danger, even when no priming has been put in the pan, because some grains may always escape through the touch-hole, and the cock may always be accidentally snapped. The caps or pills which the sportsman must carry with him are not dangerous, because it requires a very strong percussion to explode the powder. (For its manufacture, see *Mercury*.) Percussion locks have come very much into use, and attempts have even been made to introduce them into armies, though the expense of the chemical powder may be an objection.

PERCY, THOMAS, bishop of Dromore, in Ireland, a descendant of the family of Northumberland, was born in Bridgenorth, in 1728, and was graduated at Christ-church, Oxford, in 1753. In 1769, he was appointed chaplain to the king, and, in 1778, raised to the deanery of Carlisle, which he resigned four years after for the Irish bishopric of Dromore. The most popular of his works are his Reliques of Ancient English Poetry (in 3 vols., 8vo), and a poem, the Hermit of Warkworth. He was well skilled in the Icelandic and several of the Oriental languages, especially the Chinese, from which he made some translations. His other writings are a Key to the New Testament, a new version of Solomon's Song, with translations of Mallet's Northern Antiquities, and of some pieces of Icelandic poetry. He also published a curious domestic record, long extant in the Percy family, and known as the Northumberland Household-Book,—a document valuable for the light it throws on manners. His death took place at Dromore, Sept. 30, 1811.

PERDICCAS; the name of several kings of Macedonia, and, at a later period, of the most distinguished general of Alexander, a noble Macedonian, who attended him on his campaign to Asia, and enjoyed his confidence above all others. Alexander, just before his death, gave him his signet-ring, the emblem of regal power, and, by this action, seemed to fix upon him as his successor to the throne. Perdiccas was ambitious enough to desire this elevation; but the influence of his enemies and rivals prevented him from receiving a higher rank than that of guardian of the heir to the throne. He succeeded, however, in making himself second only to the king. But he aspired still higher, and was engaged in a war with his rival Ptolemy, when his soldiers mutinied, partly owing to his own arrogance. He was assassinated by his soldiers in Egypt, B.C. 321, three years after he had been appointed guardian to the successor of Alexander.

PERE DE LACHAISE. See *Lachaise*.

PEREGRINUS PROTEUS, a notorious character, who flourished in the first half of the second century, was born at Parium, in Mysia. After many excesses, he was charged with parricide, and was obliged to flee. He went to Palestine, became a Christian, and, by his zeal, which brought him to a dungeon, gained the name of a martyr. He received support and sympathy from every quarter, till the prefect of Syria set him at liberty. He now recommenced his wanderings, was excluded from the church for his vices, and then gave himself up to the most disgraceful excesses. An object of universal abhorrence, he desired at least to finish his career in an extraordinary manner. He accordingly gave out that he should burn himself alive at the Olympic games. This he did, in presence of an immense multitude, A. D. 168. Much interest has been given to the history of this singular character by the romance of Wieland.

PERENNIAL, in botany, is applied to those plants whose roots will abide many years, whether they retain their leaves in winter or not. Those which retain their leaves are called *evergreens;* but such as cast their leaves are called *deciduous*.

PERFECTIBILITY; the capacity of being made perfect. It is a word used in philosophy, religious and moral, with reference to individuals and to society, to the present and the future state. Moral duties include not only the duties which we owe to others, but also the great duty which we owe to ourselves, to strive uninterruptedly for the improvement of our mental and moral faculties. This supposes that our own improvement is in our own power, which has been doubted by certain philosophers, materialists, and others, who make our whole moral condition dependent upon causes beyond our control, thus denying, in fact, a moral condition. The question whether we can ever attain on earth to a state of perfection, resolves itself into this,—whether we can ever, in this world, acquire a perfect knowledge of our duties, and a perfect will to perform them. The consideration of the hinderances to such a will and knowledge belongs to the great question of the origin of evil. But, however imperfect may be all the attainments that we can make in this world, on which point every one's own conscience will satisfy him better than the most elaborate reasoning, no one should be deprived by such considerations from striving for all the improvement within his power. To stop, or to go backwards, is to be wretched.

Secondly, as to the perfectibility of society. It was loudly maintained by some French writers, at the beginning of the revolution of the last century, that society was making a progress which must ultimately end in a perfect state. Whether they meant that the individuals composing society would become perfect, or referred to some unintelligible perfection in the social system, distinct from the individuals composing it, history and the experience of every reflecting man sufficiently prove the notion to be visionary. For some centuries, the European races seem to have been improving in several respects; in others, however, they have essentially retrograded; and, however great the improvement, on the whole, may be, few, we believe, think that the state of human society will ever become perfect; but this is no more discouraging than the corresponding imperfection in the case of the individual. See *Civilization*.

Thirdly, as to perfectibility in a future state. Of course, we cannot mean by *future perfection* the possibility of attaining unlimited power, wisdom, and goodness, because this would destroy all difference between ourselves and God. The word *perfectibility*, used in reference to man, can, of course, mean nothing more than a capacity of unending improvement, and reason does not rebuke the hope of such a progress. It has been asked, whether the happiness to be expected from constant progress in a future state would not be counterbalanced by a despondency arising from the consciousness of imperfection, which would only increase with the increase of knowledge. Such a question seems sufficiently answered by the happiness which virtuous effort, and a consciousness of improvement, gives on earth. The beautiful illustration of Leibnitz, when he compared the relation between blessed spirits and the Deity to that existing between the asymptote (q. v.) and the hyperbola, the former of which is mathematically proved to approach the latter *ad infinitum*, without ever reaching it, is well known; but, though a beautiful comparison, it throws no light upon the question. "Eye hath not seen, nor ear heard, neither have entered into the heart of man, the things which God hath prepared for them that love him."

PERI. The Peris, in Persian mythology, are the descendants of fallen spirits, excluded from paradise until their penance is accomplished.

PERICARDIUM, in anatomy, is a membranous bag filled with water, which contains the heart in man and many other animals.

PERICARPIUM, among botanists; a covering or case for the seeds of plants.

PERICLES, one of the most celebrated statesmen of Greece, whose age (about B.C. 444) was the most flourishing period of Grecian art and science, was born at Athens. His father was Xanthippus, a general celebrated for his victory over the Persians at Mycale. Damon, Anaxagoras, and Zeno of Elea, were his instructers. Connected by family relations with the aristocracy, he at first avoided taking part in the concerns of state, both on account of the jealousy with which the multitude viewed this party, and because Cimon was already at its head. He, therefore, aimed, at first, only to gain the favour of the popular party. Cimon was munificent and affable; Pericles, on the contrary, shunned festivals and all public amusements. He was never seen abroad but in the Prytaneum and the popular assembly, and his manners were characterized by gravity and dignity. As he was not a member of the Areopagus, he used all his influence to diminish the consideration of that body, and instigated his friend Ephialtes to make that tribunal an object of jealousy in the eyes of the people, and to procure the passage of a decree, transferring the investigation and decision of most cases to other courts. His eloquence was so elevated and powerful, that it was said of him that he thundered and lightened in his speeches, and his countrymen called him the *Olympian*. He carefully avoided all that could displease the people, and even submitted to indignities with the greatest patience. It is said that a common citizen followed him to his house one evening from a popular assembly, reviling him at every step. He ordered a servant to light the man home with a torch. When the popular party procured the accusation of Cimon, Pericles was one of the judges. He conducted, however, with great moderation, and spoke of his distinguished fellow-citizen with due respect. The banishment of his rival removed all obstructions to the execution of his ambitious designs. As Cimon had fed and clothed the people, Pericles also provided for the wants of the needy from the public treasury. In the war which broke out between the Athenians and Lacedæmonians, B.C. 458, Pericles exposed himself to the greatest dangers in the unsuccessful engagement at Tanagra, and soon after invaded the Peloponnesus with a fleet and a small army. To please the people, who desired the return of Cimon, he caused a decree to be passed for his recall. By means of his sister, however, Pericles had made a private agreement with Cimon, by which the command of the army was left to the latter, and the government of the state was to be in the hands of Pericles. On the death of Cimon, he became, as it were, prince of Athens; for, although the aristocracy set up against him Thucydides, the son of Melesias, a relation of Cimon, he was too unequal to maintain the opposition. "If I should throw him to the ground," said he once of Pericles, "he would say that he had never been prostrated, and would persuade the spectators to believe him."

From this time, Pericles ruled the state, but without assuming the title of prince, and endeavoured to occupy the people with the establishment of new colonies or warlike enterprises. By his great public works, he flattered the vanity of the Athenians, while he beautified the city, and employed many labourers and artists. To pay the expenses of these undertakings, he caused the public treasury of Greece to be transported from Delos to Athens, and justified this act of perfidy by saying that the money had been raised to defend the nation from the invasion of barbarians; and, as this end had been attained by the exertions of the Athenians, the allies had no further right to inquire into the expenditure of the funds. His personal integrity in pecuniary matters was above suspicion. Of this we have a remarkable example:—During an expedition against Eubœa, the Lacedæmonians invaded Attica, as the allies of the Megarians. Pericles averted an attack by bribing the tutor of the Spartan king. When he submitted his accounts for examination, ten talents were charged for secret services, and the Athenians were satisfied without any further account. Pericles finally made himself master of the important island of Eubœa, B.C. 447, and, soon after, concluded a truce of thirty years with the Spartans. To set bounds to the popular power, which he had hitherto laboured to increase, he now procured the revival of an old law, declaring no person a citizen of Athens whose father and mother were not both Athenian citizens, and caused 5000 individuals, who had before been free, to be sold as slaves. This act is a proof of the great influence of Pericles, and, doubtless, obtained the approbation of a majority of the citizens, whose importance was increased by a diminution of their numbers. Pericles took advantage of the armistice with Sparta to make war upon the Samians, (B.C. 440), who opposed the pretensions of Athens. He was partly persuaded to undertake this war by Aspasia (q. v.). The expedition, in which she attended Pericles, ended in the subjugation of the island, and the restoration of the democratic government. The Samians soon rose and expelled the Athenian garrison; but Pericles again reduced them to subjection. On his return to Athens, he delivered the celebrated funeral oration in memory of those who had perished in the expedition, which had such an effect upon his audience, that the women crowded about him, and wreathed his temples with flowers. Thucydides was banished in the struggles of parties, and the importance of Pericles was greatly increased, till the jealousy of the Athenians awoke, when they found those hopes abortive which had been excited by the events that preceded the Peloponnesian war. Some of the friends of Pericles became the objects of public prosecutions,—Anaxagoras, his venerable instructer, on a charge of irreligion; Aspasia on account of her connexion with Pericles. He undertook to plead her cause himself, and was so affected that he forgot his dignity, and burst into tears. He procured her acquittal; but he withdrew Anaxagoras from the attacks of his enemies, by conducting him from Attica under his own protection.

When the Spartans, who had assumed the protection of the smaller states of Greece, sent to Athens, demanding a compensation for the injuries which had been done to these states, and threatening war in case of refusal, Pericles persuaded the Athenians to reject the proposal, and thus became the author of the fatal Peloponnesian war. (See *Peloponnesus*.) Some maintain that his object was to keep his countrymen employed abroad, in order to avert their attention from his government, particularly as his enemies were daily increasing, and that Aspasia entertained a violent hatred against Sparta. The probability is, that Pericles, misled by his views of the dignity and importance of the Athenian republic, would consent to no concessions, particularly as such a measure would be fatal to his own greatness. At the commencement of the war, (B. C. 431,) Pericles recommended to the Athenians to turn all their attention to the defence of the city and to naval armaments, rather than to the protection of their territories. Accordingly, as he was made commander-in-chief, notwithstanding the murmurs of the Athenians, he allowed the superior forces of the Spartans and their allies to advance to Acharnæ, in Attica, without resistance, and, at the same time, sent a fleet to the shores of Peloponnesus, to Locris and Ægina, which took twofold vengeance for the ravages in Attica. After the Peloponnesians had retired, he invaded the territory of Megaris, which had been the cause of the war. At the end of this campaign, he delivered a eulogy over those who had fallen in their country's service.

The next year, a plague broke out at Athens, which made such dreadful havoc, that Pericles was obliged to summon all his fortitude to sustain his countrymen and himself. To occupy their attention, he fitted out a large fleet, and sailed to Epidaurus; but the mortality among his troops prevented him from effecting any thing important. He returned with a small force; but the Athenians no longer put confidence in him. He was deprived of the command, and obliged to pay a heavy fine, though no particular crime was charged against him. The people, however, soon recalled him to the head of the state, and gave him more power than he had before enjoyed. But, amid his numerous civil cares, he was afflicted by domestic calamities. His eldest son, Xanthippus, who had lived at variance with him, died of the plague. The same disease carried off his sister, and many of his nearest relatives and friends, and, among the rest, Paralus, his only remaining son by his first marriage. This affliction moved him to tears. To console him for this loss, the Athenians repealed the law which he had himself previously introduced, in regard to children whose parents were not both citizens, and thus placed his son by Aspasia among the citizens. But his strength was gone; he sunk into a lingering sickness, and died B. C. 429, in the third year of the Peloponnesian war. When he lay upon his death-bed, his friends, in their lamentations, spoke of his great achievements; but he suddenly started up and exclaimed, "In these things I have many equals; but this is my glory, that I have never caused an Athenian to wear mourning."

By the death of Pericles, Athens lost her most distinguished citizen, to whom, although deficient in severe virtue, is not to be denied greatness of soul. His education enlightened his mind, and raised him above the prejudices of his age. His ambition was to give his country supremacy over all the states of Greece, and, while he ruled it, Athens maintained this rank both in an intellectual and political view. To Pericles the city was indebted for its finest ornaments—the Parthenon, the Odeon, the Propylæum, the Long Walls, numerous statues, and other works of art. The golden age of Grecian art, the age of Phidias, ceased with Pericles. His name is therefore connected with the highest glory of art, science and power in Athens; and if he is accused of having conducted the city to the edge of that precipice from which she could not escape, yet he must receive the praise of having contributed greatly to make her the intellectual queen of all the states of antiquity.

PERIER, Casimir, formerly a banker, and member of the French chamber of deputies, in which he was one of the most distinguished liberal orators, was born at Grenoble, in 1777, and, after finishing his education at the college of the oratory in Lyons, entered the military service at an early age. He served with honour in the campaigns of Italy (1799 and 1800), but on the death of his father, a respectable merchant, he abandoned the profession of arms for mercantile business. In 1802, he established a banking house in company with his brother, in the management of which he acquired an intimate acquaintance with the most difficult and important questions of public credit and finance. Cotton manufactories, machine manufactories, and several other manufacturing establishments, were carried on by the brothers, and Casimir introduced improvements into the processes. In 1815 Casimir Périer published a pamphlet against the system of foreign loans, characterized by clearness and soundness of views, and in 1817 he was elected to represent the department of the Seine in the chamber of deputies. Here he was no less distinguished as the firm and eloquent advocate of constitutional principles, than as an enlightened and sagacious financier. In the revolution of 1830, he took a decided part in favour of the national liberties; was one of the deputation appointed to wait on marshal Marmont during the three days a member of the municipal commission of the provisional government, July 28; but did not sign their declaration of the dethronement of Charles X. When Charles made his last effort to retain the throne, he ordered the duke of Mortemart to form a ministry, who made M. Périer minister of finance, and general Gérard that of war. August 5th, Périer was chosen president of the chambers, and on the 12th formed one of the first cabinet of the new king, without holding the portfolio of any department. In March, 1831, he succeeded Laffitte as president of the council, with the department of the interior; Louis being minister of finance, Sebastiani of foreign affairs, and De Rigny of the marine. (See *France*.) The chief endeavour of M. Périer's ministry, so far, appeared to be to keep France at peace with Europe, and thereby to make commerce and manufactures flourish, to establish civil liberty and repress the military spirit; and, secondly, to render the government more firm. The opposition reproached him with ignominiously courting the favour of the absolute monarchs, with having deprived France of the honourable and elevated position due to her in the European system, with being unwilling to follow up, frankly, the principles of the "July revolution," and with having sacrificed Italy to Austria, and Poland to Russia. Périer died in 1832.

PERIGEE, or **PERIGEUM**. See *Apogee*.

PERIHELION, or **PERIHELIUM**; that point in the orbit of a planet, or comet, which is nearest to the sun; being the extremity of its transverse axis, nearest to that focus in which the sun is placed, and thus opposed to the *aphelion*, which is the opposite extremity of the same axis. The ancient astronomers used, instead of this, the term *perigæum*, as they placed the earth in the centre. The perihelion distances of the several planets, the mean distance of the earth from the sun being taken as unity, are as follows:

Mercury,	.1815831	Ceres,	2.5800660
Venus,	.7184758	Pallas,	2.5122080
Earth,	.9831468	Jupiter,	5.1646127
Mars,	1.4305595	Saturn,	9.4826032
Vesta,	2.2797800	Uranus,	19.1309347
Juno,	2.4122190		

See *Aphelion* and *Equation*.

PERILLUS. See *Phalaris*.

PERIMETER, in geometry; the bounds or limits of any figure or body. The perimeters of surfaces or figures are lines; those of bodies are surfaces. In circular figures, instead of *perimeter*, we say *circumference*, or *periphery*.

PERIOD (from the Greek περίοδος, a circuit); a division of time, or of events occurring in it. The astronomer calls the time of a revolution of a heavenly body, or the time occupied in its return to the same point of its orbit, its *period*. See *Planets*, and *Kepler*.

In chronology, *period* denotes a division of time, during which certain phenomena complete their courses, which are repeated in never-ending succession. Chronology depends entirely upon astronomy; and before the latter had made known the true motions of the heavenly bodies, the former remained in a confused state. The principal periods of the Greeks were—Meton's lunar period of nineteen years, or 6940 days, according to which the Greeks computed their astronomical calendar from 432 B. C.; the period of Calippus (330 B. C.), or that of Alexander, which comprised four times nineteen, or seventy-six years *minus* one day; and the still more accurate period of Hipparchus, of 304 years, which made the tropical solar year only six minutes and sixteen seconds too long. The Roman indiction (q. v.) was a period of fifteen years, the origin of which is not very clear. The Julian period, invented by Scaliger, consisting of 7980 Julian years, was intended to reduce to the same result the different computations of the year of the birth of Christ from the creation. It is the product of the numbers twenty-eight, nineteen, and fifteen; or the solar, lunar, and indiction cycle. (See *Cycle*.) After twenty-eight times nineteen, or 532 years, the new and full moons return in the same order, upon the same day of the week and month, in the Julian calendar, and the three chronological cycles (the solar cycle of twenty-eight years, the lunar cycle of nineteen years, and the indiction cycle of fifteen years) recommence at the same time. This period is also called the great *Paschal* cycle, and the *Victorian* or *Dionysian* period. The year of the birth of Christ, in the Julian period, is 4714. It is now little used, as we reckon by years before and after Christ.

In history, a *period* is a certain division of time, determined by events, giving to it the character of a whole. A judicious division of history into periods is very necessary for a clear view of the whole, and, in fact, is the necessary result of an intelligent method of studying history. The ancients wrote general history ethnographically and chronologically, or in the way of annals. Bossuet, in his *Discours sur l'Histoire universelle*, and Offerhaus, in his *Compendium Historiæ universalis*, divided history by centuries, and by subdivisions of the latter; but modern historians have preferred to divide universal history by periods. Voltaire, in his *Essai sur l'Histoire générale*, Millot, Condillac, Gatterer, Schlözer, and, in general, all the principal modern historians, have followed this plan. The progress of civilization and of civil liberty is more important than the order of dynasties, or the fluctuations of power; and the periods of history ought to be founded upon the various stages or manifestations of these. A judicious division into periods can be effected only by a clear and philosophical view of history. Philosophical views are the great object of the study; but incautious philosophizing often leads the reader to deductions drawn from his own imagination rather than from a rigid scrutiny of facts. The division of history into periods, founded on general views, requires, therefore, great care. The philosophico-historical school of Germany, at the head of which, at present, we may put professor Hegel, has fallen into glaring errors in this respect. This same censure, however, by no means belongs to all the philosophical historians of that country, but should be confined to the school which is particularly termed *philosophical*. The division into periods must vary, both according to the chief aim of the historian and according to the amount of historical knowledge existing in his time. Thus an historian who proposes to write a history of religions, or who thinks that religious revolutions have always been the most important, and are the best standards by which to measure the other changes in human society, will establish his division into periods accordingly. Another will take, as his basis, the political changes of nations. The most perfect division would be that which should adopt, as the basis of each period, that feature which was the most strongly characteristic of it, which is not always easy, as one principle often continues strongly operative, while another has risen to an important influence, threatening to supersede it. In such a division of universal history, civilization, religion, government, learning, important inventions, &c., would all become, in turn, the bases of the various periods. See *Epochs*, and *History*.

A *period*, or *sentence*, in writing, is a series of logically connected passages; a passage developed in properly connected parts. Aristotle's definition, which makes it a discourse having its beginning and end in itself, is indistinct. Every passage would then be a period; and, on the other hand, a whole speech, a whole work, would be a period. Periods should not be too long, but it is impossible to fix the limits distinctly. Cicero's rule, that a period ought not to be longer than four hexameters, is as insufficient as the other, that it should be sufficiently short to be spoken at one breath, without exhaustion of the lungs. If it is properly constructed, the voice finds resting-places enough; and if its parts are logically connected, it is not difficult to follow their connexion, and to form a distinct conception of the whole. In some languages, the rules for the construction of periods are stricter than in others; some allow great liberty. To the former belongs the English language; to the latter, the Greek, Latin, and German. The genius of the German language, in particular, allows of very long and involved periods, in which perspicuity frequently suffers seriously; and it often happens that the whole meaning of a long sentence in that language depends upon the last word, so that we are kept in suspense as to the ideas conveyed, until the decisive word appears. The following rules should be observed in the construction of a period: 1. The chief idea must be made prominent, whilst the secondary ideas are presented with a force proportioned to their importance; 2. there should be a certain proportion between the length of the different members; 3. the subordinate parts should each serve for the more distinct explanation of the preceding, and should not be too much accumulated; 4. the ideas to be conveyed should be presented in a certain gradation, from the less distinct to the more distinct, from the weaker to the stronger, the less important to the more important, except the contrary effect is expressly intended. Important as the logical and grammatical arrangement of a period is, the musical and rythmical is by no means to be neglected. Much depends here upon tact, but study can much improve this. There is a harmony in language which, if it cannot convince, yet can strongly affect, can carry the reader along, or impress a sentiment indelibly. Yet undue refinement, an overlaboured choice of phrase, is to be studiously avoided. The rhythm of a period (the *numerus*) corresponds to the metre in poetry, and is important for all languages, particularly for those which, like the Greek or German, have a real prosody. Only a few general rules can be given for rhythm: the ear of the writer or speaker must be his principal guide. The beginning of a period should be fitted to gain the attention of the hearer. Hence it is well to choose such words as fill the ear: e. g. in languages which have a prosody, the *first pæon* (— ⏑ ⏑ ⏑), the *ionicus a majore* (— — ⏑), *the third epitrites* (— — ⏑ —), and some others. The conclusion ought to satisfy the ear by its firm and full sound. The following feet are therefore desirable: the *fourth pæon* (⏑ ⏑ ⏑ —), the *amphibrachys* (⏑ — ⏑), the *antibacchius* (— — ⏑), the *dactylus iambus* (— ⏑ ⏑ ⏑ —), the *ditrochæus* (— ⏑ — ⏑), which it is best to have in one word, and the *dactylus trochæus* (— ⏑ ⏑ — ⏑), which, however, on account of its hexametrical form, is to be used with great caution. The period should have a proper proportion of pauses, so as to be equally removed from total irregularity, and from a constantly-returning symmetry which approaches to metrical rhythm. The construction of sentences attained a perfection with the Greeks, which has not been reached by any other nation, for two reasons,—their deep and universal feeling of the beautiful, and the richness of their charming idiom in participles and well-sounding terminations. The Romans imitated the Greeks, but the example of Cicero is not to be closely followed, as he amplifies his phrases too much.

In physiology, *periods* designate the various stages in the development and decay of the animal organization, which are distinguished by a marked character; as the period of childhood, of puberty, &c. *Periods* also denote, in medicine, those repetitions of phenomena which we observe in certain diseases, e. g. in intermittent fevers, the increase of the disorder in the evening, &c. Periodical diseases are such as, at certain times, make regular attacks, or are attended with regular aggravations. This property is very common, and there is hardly a disease in which it has not been observed in the case of some individual. On the contrary, there is no disease which always pursues its course periodically.

PERIODICALS, in the proper sense of the word, are all publications which appear at regular intervals; and in the wide sense which the word has now received, it may even be considered as embracing those publications which, as is not unfrequently the case in Germany, appear from time to time, yet neither at regular intervals nor in numbers of a fixed amount of pages (*Zwanglose Hefte*). The periodical press, comprising newspapers, reviews, magazines, annual registers, &c., devoted to religion, politics, the sciences, arts, amusements, husbandry, &c., is one of the most interesting and most momentous consequences of the invention of the art of printing. At first, slips of paper containing a few particulars, intended principally for the gratification of curiosity, periodicals have now become one of the most important parts of the machinery of society, particularly in Britain, France, and America. Without an acquaintance with this department of literature, the present state of knowledge and civilization cannot be understood, and the historian will find it essential to a comprehension of the great movements of our time. We have given, in the article *Newspapers*, a sketch of the history and present state of that branch of periodical literature. The first journal of the character of a review was the *Journal des Savants*, established in 1663. Its success gave rise to *Les Nouvelles de la République des Lettres*, by Bayle; *Le Mercure*, by Visé; *Le Journal de Trévoux*, set up by P. Catrou, a Jesuit; in Italy, to the *Giornale de' Literati*; in Germany, to the *Acta Eruditorum*. In Britain, the first review of this sort was the Monthly, commenced in 1749, and still published. (For further information, see the article *Review*.) The utility of periodicals has been very great; they have spread knowledge through quarters to which the bulky productions of the sixteenth and seventeenth century never could have penetrated. The reviews, in particular, have done much to promote the cause of truth and just thinking. But the periodical press, like every thing else in the world, has its bad side as well as its good, and one of its bad consequences has been a taste for superficial accomplishment. Periodicals, however, have become a matter of necessity, as the circle of civilization has widened, as the various nations have become more and more interested in each other, and as the great interests of mankind have been more deeply investigated and more universally discussed. For a citizen of Athens, the market and the gymnasia may have afforded a sufficient supply of news to keep him acquainted with the events generally interesting to his community; the wits of Florence may have found the shop of Burchiello (q. v.) a sufficient centre of intelligence; but our times require much more regular, extensive, and effectual means for the diffusion of information on the events and productions of the day, and for the discussion of the numberless important subjects which occupy the minds of men.

PERIOSTEUM. See *Bone*.

PERIPATETIC PHILOSOPHY. The philosophy of Aristotle received this name either from his custom of teaching while walking (περιπατειν), or from the place where it was taught—a walk planted with trees. We can give but a brief sketch of the system of this powerful mind. Philosophy was to Aristotle the science of knowledge. Direct knowledge, by which we know immediately the general and necessary, rests on experience. According to him, logic, as a preparatory science, as the organ of all science, has the precedence of all. Logic either treats of appearances, and is then called *dialectics*; or of truth, and is then called *analytics*. In his Physics, he opposes the two systems then prevailing (that of emanation, which taught that all things emanated from God; and the atomic, which explained the origin of things by the concourse of atoms, eternal, like God), and assumes the eternity of the world. According to him, the heavens are of a more perfect and divine nature than other bodies. In the centre of the heavens is the earth, round and stationary. The stars, like the sky, beings of a higher nature, but of grosser matter, move, though not of themselves, but by the impulse of the *primum mobile*. Every change presupposes a *substratum* (substance), that by which a thing becomes possible; a *form*, by which a thing becomes real; and *privation*, inasmuch as the existence of a certain form is founded on the exclusion of others. All change or motion takes place in regard to substance, quantity, quality, and place. There are three kinds of substances—those alternately in motion and at rest, as the animals; those perpetually in motion, as the sky; and those eternally stationary. The last, in themselves immovable and imperishable, are the source and origin of all motion. Among them there must be one first being, unchangeable, which acts without the intervention of any other being. All that is proceeds from it; it is the most perfect intelligence—God. The immediate action of this first mover—happy in the contemplation of himself—extends only to the heavens; the other inferior spheres are moved by other incorporeal and eternal substances, which the popular belief adores as gods, and to which it attributes bodies, contrary to their nature. The soul is the principle of life in the organic body, and is inseparable from the body. As faculties of the soul, Aristotle enumerates the faculty of generation and nutrition; of sensation, memory, and recollection; the faculty of thinking, or the understanding; and the faculty of desiring, which is divided into appetite and volition. The ethical principles of Aristotle have been often misunderstood, partly on account of the degeneracy of his school; and he has been considered a supporter of the philosophy whose principle is pleasure; but to Aristotle, the best and highest (i. e. that which is desirable for itself) is the happiness which originates from virtuous actions. Virtue, according to him, consists in acting according to nature: by the expression "according to nature," he means, keeping the mean between the two extremes of the too much and the too little. Thus valour, in his view the first of virtues, is a mean between cowardice and rashness; temperance is an observance of the mean in respect to sensual enjoyments. Human actions, to be called moral, must be independent of external motives; otherwise they are but phenomena, the laws of which belong to physics, and are therefore indifferent to the practical philosopher. Self-action, and consequently the power to act or not to act, to act in one way or another, is the condition of all morality. Perfect happiness can be attained only in political society or the state; but the best form of state polity must be determined by circumstances.

The school of Aristotle (the peripatetic school) continued at Athens uninterruptedly till the time of Augustus. Among those who proceeded from it are Theophrastus, author of several works on natural history; Strato of Lampsacus, whose views are but imperfectly known to us from some fragments preserved by Cicero and Plutarch; and Demetrius Phalereus. No one of the philosophical schools of antiquity maintained its influence so long as the peripatetic. Even down to modern times, its principles served as the rule in philosophical inquiries, and some countries still honour Aristotle as an infallible master of wisdom. The Arabians did not first make him known to the philosophers of modern Europe, but they extended his authority. The acuteness and profoundness which appear in his works, his dogmatic tone, his subtile distinctions, and the technical language, first introduced by him into philosophy, pleased them more than Plato's philosophical doubts and allegorical language. But we find him in the Christian church as early as the time of the Arian controversy; and while the influence of Plato was diminished by the heresies of Platonizing teachers, that of Aristotle, which the commentaries of Boethius on his translation of Aristotle's works contributed to extend, was continually increasing. (See *Scholastics*.) When the works of Aristotle again began to be read in the original language, a peripatetic sect, differing from the scholastic, arose, in the fifteenth and sixteenth centuries, which was divided into the Averroists and Alexandrians (so called from celebrated commentators on Aristotle). To the former belonged Alex. Achillinus, Zimara, and Cæsalpinus; to the latter, the famous Pomponatius and others.

PERIPETIA; an unexpected change which takes place in the condition of the chief person of an epic or dramatic poem, a novel, &c. Aristotle gives, as an instance, the scene in Œdipus, in which the news intended to relieve the king's fears, and to cheer him, produces the contrary effect, by discovering to him his origin. Necessary as the *peripetia* is for giving interest to great compositions, a ludicrous effect is often produced by young poets heaping misfortunes upon their heroes, to surprise the reader with an unexpected deliverance. The Germans call such compositions *Rettungsstucke* (saving-pieces.)

PERIPHERY. See *Circle*.

PERIPNEUMONY. See *Pneumony*.

PERIPTERAL TEMPLE. See *Architecture*.

PERISTYLE. See *Architecture*.

PERIZONIUS, JAMES, a learned Dutch philologian of the seventeenth century, born at Damme in 1651, studied at Deventer and Leyden, and became professor of history, rhetoric, and Greek, at the latter place, where he died in 1715. His historical and philological works are numerous. The principal are *Animadversiones Historicæ* (1685), a treasure of learning; *Origines Babylonicæ et Ægyptiacæ* (1711); editions of Ælian's *Various Histories*, of the *Minerva of Sanctius*, &c.

PERJURY, by the common law of England, is a crime committed by one who, being lawfully required to depose the truth in any judicial proceeding, wilfully swears falsely in a point material to the question in dispute. It has, however, been held, that a man may be indicted for perjury for swearing that he *believed* a fact to be true, which he knew to be false. The common law takes no notice of any false swearing, but such as is committed in some court of justice, having power to administer the oath, or before some officer or magistrate invested with similar authority, in some proceeding relative to a civil suit or criminal prosecution; for the law esteems all other oaths unnecessary, at least, and hence will not punish the breach of them. Thus, if a person swears falsely in a voluntary affidavit in any extrajudicial matter, he is not liable to any punishment. By numerous statutes in England, the penalties of perjury have been extended to false oaths by electors, bankrupts, insolvent debtors, &c. By the English law, the evidence of one witness alone is not sufficient to convict on an indictment for perjury; in such case, there would be only one oath against another; but it is sufficient, if corroborated by other independent evidence. Subornation of perjury is the offence of procuring a man to commit perjury. By the law of Moses (*Deuteronomy* xix. 19), if a man testify falsely against his brother, it shall be done unto him as he had thought to do against his brother. And this is the principle adopted in the laws of many of the states of modern Europe. By the law of the Twelve Tables, "*perjurii pœna divina, exitium; humana, dedecus.*" Gellius, xx. 1, mentions, that some persons who had perjured themselves by giving false testimony, were thrown from the Tarpeian rock. The civil law punished perjury committed in swearing by the name of God, in civil cases, by infamy (*Digest*, lib. ii. tit. 4; *Code*, lib. xii. tit. 1); but the punishment of perjury committed in swearing by the safety of the emperor, was death (*Code*, iv. 1 : 2): by the genius of the prince, beating and scourging (*Dig.*

lib. xii. tit. 2, 13). The punishment of perjury, by the common law in England, was, anciently, death; afterwards banishment, or cutting out the tongue; then forfeiture of goods. At the present time, it is fine, imprisonment, and pillory, at the discretion of the court, to which the statute Geo. II., c. 25, adds a power in the court to order the offender to be sent to the house of correction for a term not exceeding seven years, or to be transported for the same period. The offender is incapacitated from giving evidence in a court of justice; but a pardon will restore his competency. By the law of the United States of America, the punishment on conviction for perjury, committed in any cause depending in any of the courts of the United States, or in any deposition taken in pursuance of the laws of the United States, is imprisonment not above three years, and fine not exceeding 800 dollars, pillory one hour, and disqualification for being a witness until the judgment is reversed. By the capitularies of Charlemagne and Louis *le Débonnaire*, perjury was punished by cutting off the hand. By the Napoleon code, perjury in criminal cases is punishable by confinement at hard labour for a limited time. If the party accused is sentenced to a severer punishment, the perjurer is to suffer the like. In cases of correctional or police jurisdiction, it is punishable by confinement. Perjury in civil suits is punishable by civic degradation. By the Prussian code, promulgated by Frederic William in 1794, whoever, whether he appears as a party or as a witness, perjures himself, is to be excluded for ever from his employments, rights, and civil profession, to undergo an ignominious exposition as a perjured person, or to be publicly declared such, and, in addition thereto, to be condemned to confinement from one to three years. If the perjury be with a view to profit the perjurer, he is to forfeit a sum quadruple of that which he endeavoured to obtain. If the perjury is committed in a capital case, and an innocent person is, in consequence, condemned, the punishment of the perjurer is death; and in cases not capital, the punishment of the perjurer is to be proportioned to the crime of which the innocent person was accused and convicted. By the law of Spain in 1804, perjury, in civil causes, is punishable with ten years' condemnation to the galleys; and in criminal cases, in which the punishment for the offence charged does not extend to death, public infamy and perpetual condemnation to the galleys. (Johnston's *Civil Law of Spain*, l. vii. tit. 17. lib. 8. Rec.)

PERKIN WARBECK. See *Warbeck*.

PERKINS, Doctor Elisha, the inventor of the metallic tractors, was born at Norwich, Connecticut, North America, in January, 1740, and was educated by his father, doctor Joseph Perkins, for the profession of medicine. He was indebted to nature for uncommon endowments, both bodily and mental. In person he was six feet high, and of remarkable symmetry. He possessed extraordinary ability to endure fatigue. His reputation and success as a physician were considerable, but he is principally known by his *metallic tractors*. These were formed by him from a composition which he discovered after numerous experiments with various kinds of metals, during several years, he having conceived the idea that metallic substances might have an influence on the nerves and muscles of animals, and be capable of being converted to useful purposes as external agents in medicine. They consisted of two instruments, one of the appearance of steel, the other of brass, and were about three inches in length, and pointed at one end. The manner in which they were applied was, by drawing the points over the affected parts in a downward direction, for about twenty minutes each time. The complaints in which this operation was found most useful, were local inflammations in general, pains in the head, face, teeth, breast, side, stomach, back, rheumatism, &c. Doctor Perkins procured a patent for his discovery, and the success which it obtained was great, not only in America, but Europe. The professors of three universities in America gave attestations in favour of its efficacy. In Copenhagen, twelve physicians and surgeons, chiefly professors and lecturers in the Royal Frederic's Hospital, commenced a course of experiments, accounts of which were published in an octavo volume. They introduced the term *Perkinism*, in honour of the discoverer, and asserted that it was of great importance to the physician. In London, a *Perkinian institution*, as it was called, was established, principally with the view of benefiting the poor by the use of the tractors; and, in a pamphlet giving an account of the institution, it was stated that the communications of cases were from disinterested and intelligent characters from almost every quarter of Great Britain, including professors, regular physicians, surgeons, and clergymen. A computation of the cures said to have been effected, presents the number of one million five hundred thousand. It may be well deemed a matter of surprise, after what we have stated, that the tractors have sunk into oblivion; but such is the fact. During the prevalence of yellow fever in New York in 1799, doctor Perkins went thither for the purpose of testing the merits of a highly antiseptic remedy which he had introduced into practice; but after about four weeks of unremitted assiduity in attending the sick, he took the disease himself, and died at the age of fifty-nine years. He was a man of great liberality of character, and of strict honour and integrity. In address and colloquial powers few of his profession excelled him.

PERMUTATIONS. See *Combinations*.

PERNAMBUCO; the name generally given to the two cities of Olinda and Recife, in Brazil. The former contains 4000 inhabitants, and is the see of a bishop. It lies about three miles north-east of the latter, in lat. 8° S. It was formerly more populous and flourishing, but since its capture by the Dutch in 1640, its commerce and manufactures have deserted it for the latter. See *Recife*.

PERON, Francois, a distinguished French naturalist, born at Cerilly in 1775, studied in the college at that place, and, in 1792, joined the army on the Rhine. Having been captured at Kaiserslautern, in about a year he was exchanged, and, having lost the sight of one eye, was discharged from the service, and returned to Cerilly in August, 1795. He then obtained admission into the school of medicine at Paris, where he applied himself closely to his studies, and also attended the lectures of the museum of natural history. When the expedition to the South seas, under captain Baudin, had been projected, Péron, with some difficulty, obtained the situation of zoologist. The vessels appointed for this service, the Geographer and the Naturalist, sailed from Havre, October 19th, 1800, and returned to France in April, 1804. They had visited New Holland, and many of the Australian and Polynesian islands: and during the whole of the voyage, Péron seized every opportunity for augmenting the stores of science, by making collections and observations. After his return, he was employed, in conjunction with captain Freycinet, to draw up an account of the voyage, and, with M. Le Sueur, to describe the new objects of natural history which had been procured. Péron died December 14th, 1810. His works are, *Observations sur l'Anthropologie;* and *Voyage de Découvertes aux Terres Australes* (1807—1816, 3 vols., 4to); an unfinished History of the Medusæ, fragments of which have been published, and several valuable memoirs on subjects of natural history.

PEROUSE, LA. See *Lapérouse*.

PERPENDICULAR, in geometry; a line falling directly on another line, so as to make equal angles on each side; called also a *normal line*. These lines may be straight lines or curves. A plane is perpendicular to another plane, if a line drawn on one of them, perpendicular to the line of intersection, forms right angles with a perpendicular line on the other plane drawn to the same point. (See *Plumb Line*.) A vertical line is one perpendicular to a horizontal line (a line parallel to the surface of calm water), so called because it passes from our vertex or zenith (q. v.) down to the nadir (q. v.), so that the vertical line is a particular kind of perpendicular line.

PERPETUAL MOTION; a motion which is supplied and renewed from itself, without the intervention of external causes. The problem of a perpetual motion consists in the inventing of a machine which has the principle of its motion within itself; and numberless schemes have been proposed for its solution. The difficulty is, that the resistance of the air, the friction of the parts of the machine, &c. necessarily retard, and finally stop, the motions of machines, and therefore seem to render perpetual motion an impossibility. Attempts have recently been made to produce a *perpetuum mobile*, by means of galvanism; a metallic bar being placed between two dry galvanic columns, is alternately attracted by each column.

PERPETUITY, in the doctrine of annuities, is the number of years in which the simple interest of any principal sum will amount to the same as the principal itself; or it is the number of years' purchase to be given for an annuity which is to continue for ever; and it is found by dividing £100 by the rate of interest agreed upon; thus, allowing five per cent., the perpetuity is £$\frac{100}{5}=20$.

PERPIGNAN; a city of France, capital of East Pyrenees, about a league from the Mediterranean sea; lon. 2° 54′ E.; lat. 42° 42′ N.; population, 15,350. It is a place of strength, and accounted one of the keys of the kingdom, on the side of Spain. It is mostly ill built and gloomy. The trade consists in corn, wool, iron, and wine. The manufactures are woollen and silk.

PERRAULT. Of four brothers of this name, who lived during the reign of Louis XIV., the most known are *Claude* (born 1613, died 1688), a physician, naturalist, and architect, from whose designs the celebrated *façade* of the Louvre, and the observatory at Paris were built; and *Charles* (born 1633, died 1703), a man of erudition, but of little taste, whose verses have not outlived his day. Colbert availed himself of their assistance in founding the French academy of art, of which Charles was the librarian. His poem *Le Siècle de Louis le Grand*, which he read before the academy in 1687, gave rise to the famous controversy on the comparative merits of the ancients and moderns. In his *Paralèlle des Anciens et Modernes* (1688—96), in the form of a dialogue, he maintains that the moderns have carried art and science, which were in a state of infancy among the ancients, to the highest perfection, and have excelled them in their works. This opinion was warmly attacked by Boileau, and zealously defended by Fontenelle and Hudart de la Motte. Perrault was also author of *Les Homme sillustres de France* (1696—1700). The *Contes de ma Mère l' Oye* (Tales of Mother Goose), of which he is the reputed author, has procured for him, but perhaps unjustly, the title of "inventor of the French Fairy Tales." See *Fairies*.

PERRON, ANQUETIL DU. See *Anquetil du Perron*, and *Zendavesta*.

PERRY. See *Pear*.

PERSECUTION OF CHRISTIANS. The persecutions which the early Christians underwent were a natural consequence of the anxiety which the free spirit of the Christian doctrine and worship, so opposite to the religious institutions previously existing, excited among Jews and heathens. As long as the Jewish state continued, the Christian communities established within its limits had little reason to expect toleration, as even the founder of their religion had been regarded as a stirrer up of sedition, on account of his opposition to the ordinances of the Jewish church, which were zealously defended by the Pharisees, who formed the ruling party; and the sanhedrim could not forgive his followers for regarding him as the true Messiah. But, as this body had not power to carry its wishes into effect, and the Christians abstained from open violation of the public peace, there was no general persecution of them in Palestine under the sanction of the Roman authorities; and only some of the heads of the congregations at Jerusalem, such as Stephen and the apostles James the elder and James the younger, suffered martyrdom,—the former forty-three, the latter sixty-three years after Christ. But the Jews in the towns of the Roman empire, where they had made settlements, and where Christian congregations soon sprung up, excited against them the suspicions of the magistrates, who, at first, may have considered the Christians as an unimportant Jewish sect, or have tolerated the new worship with less reluctance, since the introduction of a new divinity had little in it to startle the mind of a heathen. Nero, indeed, ascribed to the Christians the conflagration of the city of Rome kindled by himself, and, in the year 64, subjected them to a dreadful persecution, in which the apostles Peter and Paul suffered; but this was more an exercise of imperial tyranny than of policy, or an intolerant spirit. This *first persecution* does not appear to have extended far beyond Rome. There arose, however, a *second*, in the year 95, because Domitian, deceived by the royal title which the Christians gave to Jesus, after fruitless inquiries for the supposed relations of Jesus and pretenders to the crown, caused many of his followers, particularly in Asia Minor, to be banished, or put to death.

What is called the *third persecution* of the Christians, took place in the time of Trajan, who issued an edict against secret societies, which was followed, in 105, by a prohibition of their meetings, and the punishment of some refractory individuals, because the Roman proconsuls (for example, Pliny the younger, in Bithynia) considered the refusal of the Christians to pay the usual homage to the image of the emperor as deserving of punishment; and their suspicions were awakened by the independent character of the followers of the new faith, and their deviation from the national customs. Charges of outrage and sedition, principally excited and spread abroad by the Jews, increased the unfavourable disposition of the heathens towards the Christians. It was said that they were accustomed, in their assemblies, to eat human flesh (a misconception of the eucharist), and to practise shameful vices, and not only to aim at the destruction of the old religion, but at the overthrow of the Roman imperial throne, and the foundation of a new monarchy. These reports easily grew out of their peculiar habits. The obscurity in which they enveloped themselves, on account of their well-founded apprehensions; the spirit of their associations, which kept them separate from the rest of the world;

their secret meetings for religious exercises, often held by night,—were sufficient to furnish materials for suspicion; and the extravagant expectations which many among them entertained of the near return of Christ, their zeal against heathen manners and customs, and their open opposition to the worship of idols, from which they annually converted thousands, excited the heathen priests and magistrates against all that bore the name of Christian. Yet the followers of the new religion, being almost entirely confined to the lower class, and being split into a variety of sects, chiefly Gnostics, which were continually increasing, were objects rather of contempt than of fear; and, next to the protection of an overruling Providence, it is principally owing to this circumstance that, notwithstanding several occasions for new persecutions, and notwithstanding the zeal with which their doctrines were assailed by heathen philosophers (as, for example, Celsus, who wrote against Christianity about 140), they enjoyed above fifty years of undisturbed tranquillity, until the fourth persecution so called. In Asia Minor, they were violently assailed, about the year 160, by the heathen populace; and the Christian apologist Justin Martyr, and the bishop of Smyrna, Polycarp, were put to death. About the year 177, Marcus Aurelius treated the new congregations in Gaul, at Vienne and Lyons, with great severity, and many Christians suffered martyrdom *(fourth persecution)*.

About the end of the second century, a strong disposition was manifested to unite the congregations, which had been hitherto independent of one another, into one church. The spiritual teachers, too, growing bolder with the increase of their distinctions and privileges, showed a disposition to grasp more authority, and often came into collision with the civil magistrates; and the Christians, having become numerous and powerful, openly derided the pagan worship, now sinking into decline. These circumstances led to wild outbreaks of the heathen populace, bent on revenging the insults offered to their gods (about 192), and a dreadful slaughter ensued. The emperor Septimius Severus, moreover, in 202, forbade the accession of new converts to the Jewish and Christian religions, and this decree was followed by still severer oppressions of the Christians. See *Martyrs*, and *Saints*.

After this *fifth persecution*, the Christians enjoyed toleration and peace from 211, under Caracalla, Macrinus, and Heliogabalus, and, under Alexander Severus, even privileges and distinction. The restraints imposed upon them by the emperor Maximian (235) received the name of the *sixth persecution*, although, properly speaking, only Christian teachers and clergymen were oppressed by this emperor; but the oppressions which many of the congregations underwent were inflicted without his command. Private hatred, in fact, often led to outrages against the Christians, and excited the populace to assail them. This happened at Alexandria, in the latter years of the reign of the emperor Philip the Arabian, who was, personally, well-affected towards them. But his successor, Decius, began his reign (249) with a persecution of the Christians (the *seventh*) throughout his kingdom. The universality of this persecution, and the perseverance and cruelty with which it was pursued, made it plain that the emperor's purpose was to extirpate them entirely, and induced many to fall from their faith. Fortunately, however, from the rapid changes in the government at this period, the persecuting policy was not very steadily followed. Valerian, in 257, put to death few but the clergy (*eighth persecution*); and the execution of the edict of Aurelian against the Christians (274, the *ninth persecution*, as it was called) was prevented by his violent death. A severe persecution (the *tenth*) took place under the emperor Diocletian, at the instigation of his ministers, Galerius and other enemies of the Christians, in 303. Throughout the Roman empire, their churches were destroyed, their sacred books collected and burned, and all imaginable means of inhuman violence employed to induce them to renounce their faith. As they were accused, moreover, of a rebellious spirit, and of kindling a conflagration in the royal palace at Nicomedia, thousands suffered martyrdom. Constantius Chlorus, a sovereign favourable to them, was unable to protect them entirely in his Gallic and British provinces; and in Greece, Illyria, Italy, and Spain, Galerius, Maximinus, and Licinius pursued them with imprisonments and executions, principally directed against the clergy, till 310. These were the last oppressions of the Christians under the Roman government. Constantine the Great (312 and 313) restored to the Christians full liberty, and the use of their churches and goods; and his conversion to Christianity made it the established religion in the Roman empire.

Christianity afterwards experienced oppression without the limits of the Roman empire; for instance, in 343 and 414 in Persia, and from 437, with little interruption, till the commencement of the sixth century, in the African kingdom of the Vandals; but the efforts of some Roman emperors favourable to heathenism, as Julian and Eugenius, for the restoration of the pagan worship in the Roman empire, were more prejudicial to themselves than to the Christians. After the establishment of islamism, the caliphs in Asia and Africa laboured, with success, for the extirpation of Christianity, and spared only particular schismatic sects, which still enjoy, under the protection of the Mohammedans, the free exercise of their religion.

Christians themselves, after it had become a crime to be a heretic (see *Heretic* and *Inquisition*), persecuted one another most bitterly; and the outrages which the early Christians had suffered from the heathens were tolerable, compared to the religious wars which they waged against each other in the middle ages, and to the sufferings inflicted on *heretics*, so called, by the inquisition, and by fanatical princes, even to the eighteenth century. But, as heathen Rome could not stop the spread of Christianity, so Protestantism, in later times, rooted itself the more firmly in proportion to the tempests which assailed it; for the direct tendency of persecution is to awaken a spirit of heroic resistance, and a zeal to make sacrifices for the cause of truth.

PERSEPHONE. See *Proserpine*.

PERSEPOLIS. In a northern direction from the Persian capital of Shiraz are the ruins of ancient structures of different ages, among which are the only remains of ancient Persian architecture, belonging to the most flourishing period of that powerful nation. There are other architectural remains, with inscriptions, belonging to the time of the modern Persian empire, which originated in the third century of the Christian era, out of the Parthian empire. (See *Parthians*.) These latter remains lie about four or five miles from the ruins of Persepolis proper, and consist partly of works of sculpture, partly of inscriptions in the ancient Pehlvi language, cut in the rocks. They are called, by the Arabs, *Nakshi Rustam* (the image of Rustam) because they were regarded as intended to commemorate the deeds of this ancient hero; but, according to De Sacy's satisfactory explanation, they relate to the kings of the modern Persian race (the Sassanides). (See *Persia*.) Many inscriptions in Arabic, the later Persian, and other languages, were put here in the century after Mohammed. The ancient Persian monuments differ essentially from all the rest of the ruins. These are the ruins of the proper palace of Persepolis, called, by the Arabs, *Chilminar*, i. e. the *forty* (used indefinitely to signify many) *columns*, with two tombs near it; four tombs towards the north-east, near Nakshi Rustam, called the *tombs of the kings*, with the ruins of some other ancient buildings; and lastly many remains and columns of unfinished tombs between Chilminar and Nakshi Rustam. All these remains are represented in Chardin's Travels through Persia, and in Niebuhr's Travels to Arabia. The chief monument is Chilminar, undoubtedly the remains of a great and magnificent structure, encircled in the rear by rocky mountains, which open in the form of a crescent, and consisting of three divisions, one above the other, and built entirely of the most beautiful gray marble, the immense blocks of which are put together with admirable art, without mortar. Marble stairs, so wide and easy of ascent, that ten horsemen can ride up them abreast, lead from the lower divisions to the higher. At the entrance of the portico, to which the steps belonging to the first division lead, fabulous animals are seen, wrought in the still remaining pilasters, as if to guard the palace. Similar steps lead to the second division, to a colonnade, several columns of which still exist, fifty feet high, and of such a circumference that three men can hardly clasp them. This colonnade leads to several detached buildings, of which the largest stands in the same division; the others, farther back, form the third division. These houses contain a number of chambers, of different sizes, and seem to have been real dwellings. They are ornamented with a number of images representing processions, people of all ranks, combats of fabulous animals with one another and with men. In the wall of the rock against which the building stands, are two large tombs. At a considerable height from the ground, a *façade* is hewn in the rock itself, behind which is a chamber that can be entered only by a passage broken through, as no regular entrance has been found. Beneath, the rock is cut perpendicularly, in order to make the monument entirely inaccessible. The best representation of the ruins is to be found in Niebuhr.

The result of the most recent investigations, compared with the information contained in the ancient writers, is, that the monuments of Persepolis are actually of Persian origin, and the tombs those of Persian kings, belonging to the buildings called *Chilminar*, with which they are connected by subterranean passages. Though the buildings belong to Persian antiquities, yet it is probable that the Persians themselves did not construct them, but caused them to be erected by others; and their truly Asiatic character affords foundation for the supposition that they were built in imitation of the architecture of the Medes (to whom the Persians were indebted, in general, for their civilization), under the direction of the priests. The ruins of Persepolis proper are most probably not all of the same age, but the work of several Persian kings. Persepolis was not destined for a temple, for the Persians, professing the religion of the Magians, had no temples; nor was it a palace of the kings, because, though it may have originated, as most of the capitals of Asia did, from the residence of the kings of the first conquerors, it soon ceased to be their actual abode. But the ideas of country, power, and religion attached to it, made it the receptacle of the royal dead, and the sanctuary of the people. The various images represent the whole private life of the king, as it was strictly prescribed by the Magians. Immediately after their accession to the throne, the Persian kings proceeded to Persepolis to be invested with the garment of Cyrus, and, at certain times, visited this holy place to sacrifice on the summits of the mountains. After the death of a king, his apparel, utensils, and even his treasures, were preserved here, as the tomb of the king was considered a fit dwelling to be provided with all necessaries. For this reason, not only numerous guards protected the palace, but also the most important officers of the deceased king, perhaps even his wives, were obliged to remain near the tomb. Alexander, after overcoming Darius, gratified his revenge by the destruction of Persepolis. (See *Alexander*.) The mechanical execution of these monuments is very perfect, and no country on earth, Egypt only, perhaps, excepted, can show such masonry as these ruins. The character of this architecture, however, is totally opposite to that of the Egyptian monuments. Surprising assiduity and minuteness of execution are shown in the ornamental work. The inscriptions on these ruins are in a threefold character—comprised under the general name of *arrow-headed* character—and also in three different languages. The oldest character, undoubtedly, consisting of letters, is, according to the unanimous opinion of critics, in the Zend language, a sacred idiom of the Magians: the characters of the second kind seem to belong to the Pehlvi language; and the third are, perhaps, Assyrian or Babylonian. Grotefend and Lichtenstein have been particularly successful in the explanation of these characters. Drawings, still more exact than those of captain Keppel, and accounts of newly discovered bass-reliefs in Persepolis, have been given by Jam. Edw. Alexander, in his Travels from India to England, through Persia, Asia Minor, &c., 1825—1826 (London, 1827, 4to).

PERSEUS; son of Danae and Jupiter. Polydectes, king of Seriphos, an island in the Archipelago, who had received him with his mother, soon wished to remove from his court the young and daring hero. Under pretence, therefore, of suing for the daughter of Œnomaus, he requested from his friends presents of rarities to make his wedding feast more splendid. Perseus promised him the head of the Gorgon (Medusa). Beyond the ocean, just on the borders of eternal night, dwelt the formidable Gorgon race, with serpent-locks and serpent-girdles, of whom Medusa alone was mortal. Conducted by Mercury and Minerva, he first went to the three Graiæ, on the western coast of the ocean; who had but one eye and one tooth, in common. Perseus got possession of these, and promised to restore them on condition that they would bring him to the nymphs, who kept the instruments which he needed in this enterprise,—the talaria, or winged shoes, the bag, and the helmet of Pluto, which made its wearer invisible. They agreed to the condition, and Perseus obtained from the nymphs what he desired. Other accounts say, that he was furnished by Mercury and Vulcan. Led by Mercury and Minerva, he reached the slumbering Gorgons. With his face averted, he approached the monsters, whose look transformed the spectator into stone, saw the head of Medusa by reflection in his brazen shield, and cut it off. From the drops of blood sprang Pegasus and Chrysaor. With the head in his bag, he escaped from the pursuing sisters, by means of the helmet of Pluto. On the winged sandals of Mercury, he now hovered over various regions, seeking adventures. He went to king Atlas, who had been informed by an oracle, that a son of Jupiter would strip his garden of the golden apples which it bore, and therefore refused to Perseus the rites of hospitality, who, presenting to his eyes the Gorgon's head, changed him into a rock, which was doomed to support the heavens. He then delivered Andromeda (q. v.). By her he became the father of Perses, whom he left in the care of his grandfather Cepheus, and returned with Andromeda to Seriphos. Here he found his mother at the altar of Minerva, to which she had fled with his foster-father Dictys, to escape the violence of Polydectes. He transformed the latter, with all his associates, into stone; and having placed Dictys upon the throne of Seriphos, he returned to Mercury the talaria, the bag, and the helmet, and gave to Minerva the Gorgon's head, which she fixed in the centre of her shield, or, according to some, on her breastplate. Perseus then went to Argos with Danae and Andromeda, to visit his grandfather Acrisius. To avoid the predictions of an oracle, Acrisius had fled to Thessaly; but he could not escape his destiny; for Perseus followed him there, and killed him accidentally with the discus, of which he was the inventor. In consequence of this event, he refused to ascend the throne of Argos, which had thus fallen to him, and exchanged it for Tirynthus, the kingdom of Megapenthes. Here he founded Mycenæ. Besides Perses, the founder of the Persian nation, Andromeda also became the mother of Alcæus, Sthenelus, Eleus, Mestor, Electryon, and a daughter named Gorgophone. After his death, Perseus was worshipped as a hero, and placed among the stars. The fable of Perseus has been, by some writers, derived from Persia, and been interpreted as typical of the introduction of agriculture from Upper Asia or Persia into Greece. He is the Bersin of the Shahnameh.

PERSIA (*Iran*, *Chahistan*); a country of Asia, between 25° and 40° N. lat., and 44° and 64° E. lon.; bounded N. by Russia, the Caspian sea, and Independent Tartary, W. by Turkey, S. by the Persian gulf, and E. by Beloochistan and Afghanistan; comprising about 390,000 square miles, with a population of about 6,500,000. The centre of Persia is an elevated plain, containing several deserts of sand. The northern provinces, in which rises the chain of the Ararat, and the western parts of the country, are mountainous. To the east of the Tigris, and nearly parallel with it, is a granitic ridge, called by the ancients *Zagros;* and also parallel with the same is the Orontes (now *Elwind*), which separates into two branches, one of which, to the west of the Caspian sea, is connected with the Elbour, or the Caspian chain, a prolongation of the Taurus. The country on the Caspian is lower than the coasts on the ocean, and is surrounded by a semicircular barrier of mountains, which are a continuation of the Taurus and Caucasus, and present a much steeper descent towards the Caspian than on the land side. In the southern part of Persia, the elevation of the country is more gradual than in the north and west; and along the Persian gulf, there is a narrow strip of low land, which is uninhabitable in summer on account of the heat. As we recede from the sea, and approach the mountains, the climate becomes cooler. The elevated northern and western regions are temperate, and, in winter, cold. Earthquakes are not uncommon: in 1824, a shock, which continued six days and six nights, destroyed the city of Shiraz (50,000 inhabitants) and Kazroun; mountains disappeared without leaving a trace behind. It is remarkable that so extensive a country has no considerable river, although it contains many high mountains. There are a few small rivers that lose themselves in the sand, or are consumed by canals, which serve the purpose of irrigation. Persia, however, contains several lakes, among which are that of Erivan and Bakteghian or Salt lake. All the water is impregnated with salt; the lakes are all saline, and wherever water has stood in winter, the soil is found to have become salt. The extensive plains are, many of them, covered with water in winter, and in summer present a bare, hot surface, coated with saline matter. The mountains are naked; the hills dry and barren. On account of the scarcity of water, but a small portion of the plains is cultivated; the remainder is either naked, or merely bears some succulent plants, which soon wither. There are, however, some fertile tracts. The country supplies excellent horses and asses, dromedaries, cattle, broad-tailed sheep, silk, grain, rice, pulse, melons, sesame, saffron, madder, hemp, flax, tobacco, poppies, liquorice, sugar-cane, date-palms, cassia, mastic, rich wines, cotton, manna, gum tragacanth, senna, galbanum, assafœtida, rhubarb, all the fruits of the temperate zone, and fine tropical fruits, gall-nuts, copper, iron, lead, saltpetre, sulphur, salt, &c.

The inhabitants are partly Tadshiks, consisting of a mixed race of Parsee, Arabic, &c., origin, Parsees, or fire-worshippers, and Armenians; and partly nomads, among whom the Curds are the principal nation. The Tadshiks (modern Persians) are superior to the Ottomans in civilization, and manifest a strong passion for the arts and sciences. They are Mohammedans, of the sect of Ali, or Shiites. A peculiar Mohammedan sect, the Sabians, worship the cross, have a sort of baptism, and call themselves disciples of St John. The Ishmaelites also form a distinct sect. The Parsees are Guebers, of the philosophical sect of Sophis. (See *Sophis*.) Jews and Christians are tolerated in Persia. The Persians are simple in eating, and use little animal food—pilau, or rice stewed, and fruits, being their favourite dishes. But they luxuriate in baths, and almost the very poorest of them endeavour to possess a horse. They are also splendid in their attire, lavishing on their dress gold, silver, and precious stones. The following cuts represent the costume of Persian females:

The women of rank never appear in public without long veils. The annexed cut represents the costume of a Persian of rank.

The Persians are distinguished for their skill in dyeing, and in silk and woollen manufactures. They manufacture shagreen, morocco, work in gold and silver to great perfection, and make excellent sword-blades, and a great number of articles of copper-ware. In agriculture they make great use of artificial irrigation, which is at present a monopoly of the government. The commerce, which is considerable, is chiefly carried on by caravans to India, Turkey, and Arabia. The navigation of the Persian gulf is mostly in the hands of foreigners. The navigation of the Caspian sea is open to the Russians and Persians; but the latter, by the terms of the treaty of 1828, are excluded from maintaining ships of war in its waters. Arts and sciences are held in esteem, but are by no means in a flourishing condition. The study of the Koran, divination, astrology, a sort of ethics, medicine, and poetry, are the chief departments of education. The style of architecture is simple, sculpture almost unknown, the music detestable. The government is an absolute despotism; at the head of it is the shah, with unlimited power. Jaubert estimated his income at £2,250,000. The twelve provinces into which the kingdom is divided are governed by khans. The nomadic tribes enjoy a sort of independence under their chiefs, and form the main body of the military force. Abbas Mirza, the heir apparent, has endeavoured to form troops with the European discipline. Persia has no naval force, owing partly to a want of ship-timber. The largest town is Ispahan, formerly one of the principal cities of Asia, now much reduced. The capital is Teheran (50,000 inhabitants in winter; 10,000 in summer.)

History.—The history of Persia first emerges from the obscurity of antiquity with Cyrus. The dynasty of the Mahabads is mentioned by Oriental writers as the first. It was followed by that of the Pishdadians (coeval with our Assyrian empire). After the Pishdadians, the Kajanides ruled for 718 years. Gustasp (Hystaspes), the Median Cyaxares, or his contemporary, under whom Zerdusht (Zoroaster) lived, belongs to the uncertain time before Cyrus. With Cyrus, 559—529 B. C., began the period of Persian power in the West. By uniting the Persians and Medes under his sceptre, he made them the ruling nation in Western Asia; he conquered Crœsus, took Babylon, and reduced Asia Minor. He was succeeded by his son Cambyses (529—522), who conquered Tyre, Cyprus, and Egypt. After him, a Magian ruled for a short time, who gave himself out as Smerdis, brother of Cambyses. He was dethroned, and Darius Hystaspes obtained the crown by lot, or the choice of his colleagues (521—487 B. C.) He reduced the revolted kingdom of Babylon, and subdued Thrace, Macedonia, (512 B. C.), and a small part of India; but his attempt to conquer the Scythians beyond the Danube was unsuccessful. He reduced the Greek colonies in Asia Minor, which had attempted to shake off the Persian yoke (501 B. C.); but he was unfortunate in his war against the European Greeks, and Egypt revolted from him. His son Xerxes (487—467 B. C.) effected the submission of Egypt, but was defeated by the Greeks on the field of Marathon and at Salamis, and was obliged to defend himself against their attacks in a disastrous war. Under Artaxerxes Longimanus, the *Ahasuerus* of the Scriptures (until 425 B. C.), the first symptoms of decline became visible. Egypt again revolted, and was again conquered, after a bloody struggle. The Greek war terminated disadvantageously in 449 B. C. (See *Cimon*.) Megabyzus excited a dangerous insurrection. The weak king was governed by his mother and wife. The next changes of government were rapid and violent. Xerxes II., his only legitimate son, was murdered, after a reign of forty-five days, by his natural brother Sogdianus, who suffered the same fate six months afterwards, by the hands of another illegitimate son of Artaxerxes,—Ochus, who assumed the name of Darius II., and reigned until 404 B. C., under the influence of his wife Parysatis. The revolts of his satraps hastened the decline of the empire, and the Persians were obliged to acknowledge independent kings in Egypt. But the internal troubles in Greece, of which the Persians artfully took advantage, saved them, for a time, from a united attack by the Greeks. Artaxerxes II., Memnon, or Mnemon (until 361 B. C.), was entirely under the influence of his mother, Parysatis. His brother Cyrus, supported by 10,000 Greeks under Xenophon, attempted to dethrone him, (400 B. C.), but was defeated and killed. Domestic dissensions obliged the Lacedæmonians to abandon their advantages in Asia Minor, and to conclude the disadvantageous peace of Antalcidas (387 B. C.) Artaxerxes III., Ochus (until 338 B. C.), son of Mnemon, secured his throne by putting to death his numerous brothers. He recovered Egypt (350 B. C.); but his eunuch, Bagoas, poisoned him on account of his cruelty, successively murdered all his sons, and gave the crown to Darius Codomannus, a prince of the blood, who was conquered by Alexander in three decisive actions, on the Granicus, at Issus, and Gaugamela, and lost his life (330 B. C.); after which Alexander made himself master of the whole empire (329 B. C.) On the dissolution of the Macedonian empire, after the death of Alexander (323), the Seleucides (see *Seleucus*) ruled over Persia until 246 B. C. They were succeeded by the Arsacides, who founded the empire of the Parthians, which existed until 229 A. D. Ardshir Babekan (Artaxerxes) then obtained the sovereignty of Central Asia, and left it to his descendants, the Sassanides, who ruled 407 years. With them begins, according to Hammer, the romantic character of Persian chivalry; and the six most renowned rulers of this dynasty, among whom are Behramgur, Chosroes, Parwis, and Nushirvan, are the subjects of Persian romances. Ardshir, son of Sassan, ruled from 218 to 241. The wars which he carried on with the Romans were continued under his successor, Shapur (Sapor I., until 271), against Gordian and Valerian (the latter of whom fell into the hands of Sapor, and was treated in a most revolting manner), and were not terminated until the peace of king Narses with Diocletian (303). When Sapor the Great (from 309 to 380) had become of full age, the empire again recovered strength. He punished the Arabs for their incursions, and took the king of Yemen prisoner, and demanded from the emperor of Constantinople the cession of all the country to the Strymon, as Ardshir had once done. Constantine the Great, Constantine II., and Julian resisted his demands; but Jovian purchased peace by a cession of the five provinces in question and the fortress of Nisibis. Sapor also extended his conquests into Tartary and India. War and peace successively followed, without any important events, after the death of Sapor. Under Artaxerxes II. (until 383), Sapor III. (until 388), and Vararanes IV. (until 399), the empire flourished. Arabs, Huns, and Turks successively appear on the field, as allies or enemies of Persia. Yezdegerd I. (until 420), a friend of the Christians, conquered Armenia in 412. In the year 420, Vararanes V. ascended the throne by the aid of the Arabs. He was victorious against Theodosius II., defeated the Huns who invaded his empire, and conquered the kingdom of Yemen. He was succeeded by Vararanes VI. (until 457) and Hormisdas III. In the year 457, Firus (Pheroses) ascended the throne by the assistance of the Huns, but afterwards made war against them, and lost his life in battle in 483. Valens, or Balash (from 488 to 491) was stripped of a part of his territories by the Huns, and obliged to pay them a tribute for two years. The Sassanides, however, soon regained their greatness and power. Cobad (until 531) subdued the Huns; and, though he had recovered his throne, in 498, by their assistance, yet, at a later period, he waged a successful war against them, against Athanasius, the Indians, and Justinian I. His youngest son and successor, Chosrou Anushirvan (from 531 to 579) was distinguished for his uncommon wisdom and valour. Under him the Persian empire extended from the Mediterranean to the Indus, from the Iaxartes to Arabia and the confines of Egypt. He waged successful wars with the Indians and Turks, with Justinian and Tiberius, and the Arabs, whom he delivered from the oppression of petty tyrants, and suppressed the rebellions of his brother and his son. The Lazians in Colchis, wearied with the Greek oppression, submitted themselves to him; but, when he attempted to transfer them into the interior of Persia, they again placed themselves under the dominion of Justinian, whose arms were now victorious. Anushirvan died of grief during the negotiations for peace. War continued under Hormuz (Hormisdas IV., from 579 to 59, until the reign of Chosrou II. until 628), under whom the Persian power reached its highest pitch. By successful wars he extended his conquests, on the one side to Chalcedon (616), on the other over Egypt to Lybia and Æthiopia, and finally to Yemen. But the fortune of war was suddenly changed by the victorious arms of the emperor Heraclius. Chosrou lost all his conquests, and his own son Sirhes made him prisoner, and put him to death (628). The decline of Persia was hastened by continued domestic feuds. Sirhes, or Kabad Shirujeh, was murdered in the same year. His son Ardshir (Artaxerxes) III., but seven years old, succeeded him, and was murdered, in 629, by his general Serbas (Sheheriar.) The chief Persians prevented Serbas from ascending the throne; and, after numerous revolutions, succeeding each other so rapidly that the historians have confounded the names, Yezdegerd III., a nephew of Chosrou, ascended the throne in 632, at the age of sixteen. He was attacked by caliph Omar, in 636, and Persia became a prey to the Arabs and Turks. Yezdegerd lost his life in 651.

With the conquest of Persia by the caliphs begins the history of the modern Persian empire. The dominion of the Arabs (see *Caliph*) lasted 585 years, from 636 to 1220. As some of the Arab governors made themselves independent, and Persian and Turkish princes possessed themselves of single provinces, Persia continued to be divided into numerous petty states. Among the principal dynasties were, in the north and north-east, 1. The Turkish house of the Thaheridis in Khorasan, from 820 to 872; 2. the Persian dynasty of the Soffarides, which dethroned the one last named, and ruled over Khorasan and Farsistan until 902; 3. the Samanide dynasty, which established its independence on Khorasan in 874, under Ahmed, in the province Mavaralnar, and lasted to 999. Ishmael, Ahmed's son, dethroned the Soffarides, and became powerful; and under his descendants originated, 4. the Gaznavides, in 977, when Sebektechin, a Turkish slave and governor of the Samanides at Gazna and Khorasan, made himself independent at Gazna. His son Mahmood subdued, in 999, Khorasan, and, in 1012, Farsistan, and thus put an end to the dominion of the Samanides. He subsequently conquered Irak Agemi (1017) from the Bouides, and even extended his conquests into India. But his son Masud was stripped of Irak Agemi and Khorasan by the Seljooks (from 1037 to 1044); and the Gaznavides, weakened by domestic divisions, became, under Malek Shah (1182), a prey to the Gourides. 5. The sultans of Gour (Gourides) became powerful, in 1150, by means of Aladdin Hosain, but lost their ascendency, after several great reigns, partly by the encroachments of the princes of Khowaresm, and partly by domestic dissensions. 6. The dynasty of the Khowaresmian shahs (from 1097 to 1230) was founded by Aziz, governor of the Seljooks in Khowaresm, or Karasm, where he rendered himself independent. Tagash (1192) destroyed the empire of the Seljooks, and took Khorasan from the Gourides. His son Mohammed conquered Mavaralnar, subdued the Gourides and Gazna, and occupied the greater part of Persia. But, in 1220, the great khan of the Monguls, Gengis Khan, and his heroic son Gelaleddin Mankbern, deprived him of his dominions; and he died in 1230, after a struggle of ten years, in a lonely hut in the mountains of Curdistan. In western and north-eastern Persia reigned, 7. Murdawig, a Persian warrior, who founded a kingdom at Dilem, in 928, which soon extended over Ispahan, but was destroyed by the Bouides. 8. The Bouides (sons of Bouia, a poor fisherman, who derived his origin from the Sassanides), by their valour and prudence, extended their sway over the greater part of Persia, and, in 945, even over Bagdad. They were chiefly distinguished for their virtues and love of science, and maintained themselves until 1056, when Malek Rahjm was obliged to yield to the Seljooks. 9. The Seljooks, a Turkish dynasty, as is supposed, driven by the Chinese from Turkestan, first became powerful in Khorasan, with the Gaznavides. Togrulbeg Mahmood, a brave and prudent warrior, drove out the son of Mahmood, the Gaznavide sultan, in 1037; extended his dominion over Mavaralnar, Aderbijan, Armenia, Farsistan, Irak Agemi, and Irak Arabi, where he put an end to the rule of the Bouides at Bagdad, in 1055, and was invested with their dignity, as *Emir el Omrah*, by the caliphs. Some of his descendants were distinguished for great activity and humanity. The most powerful of them, Malek Shah, conquered also Georgia, Syria, and Natolia (Roum). But the empire gradually declined, and was divided into four kingdoms, which were destroyed by the shahs of Khowaresm (1162 and 1195), the atabeks of Aleppo (1139), and the Monguls (1194). Gengis Khan established the power of the Tartars and Monguls in Persia (1220—1405). Those Persian provinces which had been acquired by Gengis Khan fell to his younger son, Tauli, in 1229, and then to the son of the latter, Hulaku, at first as governors of the Mongolian khans, Kajuk and Mangu. Hulaku extended his dominion over Syria, Natolia, and Irak Arabi. He or his successor became independent of the great khan, and formed a separate Mongolian dynasty in those countries, which sat on the throne till the death of Abusaid, without heirs, in 1335. His successors, also descendants of Gengis Khan, had merely the title of khans of Persia. The empire was weak and divided. Then appeared (1387) Timurlenk (Tamerlane) at the head of a new horde of Monguls, who conquered Persia, and filled the world, from Hindoostan to Smyrna, with terror. But the death of this famous conqueror was followed by the downfall of the Mongul dominion in Persia, of which the Turkomans then remained masters for a hundred years. These nomadic tribes, who had plundered Persia for two centuries, wrested, under the reigns of Kara Jussuf and his successors, the greatest part of Persia from the Timurides, were subdued by other Turkoman tribes under Usong Hassan (1468), and incorporated with them. They sunk before Ishmael Sophi (1505), who artfully made use of fanaticism for his political purposes, and whose dynasty lasted from 1505 to 1722. Ishmael Sophi, whose ancestor Sheikh Sophi pretended to be descended from Ali, took from the

Turkomans of the white ram, Aderbijan (1505 to 1508) and part of Armenia, slew both their princes, and founded upon the ruins of their empire, after having conquered Shirvan, Diarbeker, Georgia, Turkestan, and Mavaralnar, an empire which comprised Aderbijan, Diarbeker, Irak, Farsistan, and Kerman. He assumed the name of a shah, and introduced the sect of Ali into the conquered countries. His successors, Thamas (1523 to 1575), Ishmael II. (from 1576 to 1577), Mohammed (1577 to 1586), Hamzeh (1586), Ishmael III. (1587), carried on unsuccessful wars against the Turks and the Usbecks. But the great shah Abbas (1587 to 1629), re-established the empire by his conquests. He took from the Turks Armenia, Irak Arabi, Mesopotamia, the cities of Tauris, Bagdad, and Bassora; Khorasan from the Usbecks; Ormus from the Portuguese, and Kandahar from the Monguls; and humbled Georgia, which had refused to pay tribute. He introduced absolute power into Persia, transferred his residence to Ispahan, and instituted the pilgrimage to Meshid, in order to abolish that to Mecca among the Persians. The following rulers, Shah Sesi (1629 to 1642) and Abbas II. (1642 to 1666) had new wars with the Turks and Indians; with the former on account of Bagdad, which was lost; and with the latter on account of Kandahar, which was reconquered in 1660. Under shah Soliman, however, (1666 to 1694), the empire declined, and entirely sunk under his son Hussein. The Afghans in Kandahar revolted, in 1709, under Mirweis; and his son Mir Mahmud conquered the whole empire, in 1722. A state of anarchy followed. Mahmud, having become insane, was dethroned by Asharf, in 1725; the latter was subdued by Thamas Kuli Khan, who, with the assistance of the Russians and Turks, placed Thamas, son of Hussein, on the throne in 1729. But, when the latter ceded Georgia and Armenia to the Turks, Kuli Khan dethroned him, and placed his minor son, Abbas III., on the throne. He recovered, by conquest or treaties, the provinces ceded to the Russians and Turks, and ascended the throne under the title of *Shah Nadir*, Abbas III. having died in 1736. He restored Persia to her former importance by successful wars and a strong government; conquered Bahareim (1735) and Balk (1736) from the khan of Bucharia, Kandahar (1738); invaded (1739) Hindoostan, and obliged the great mogul Mohammed to cede to him some provinces on the Indus, and most of his treasures. But, in 1747, Nadir was murdered by the commanders of his guards, and his death threw the empire again into new confusion. Four kingdoms were now formed: 1. Khorasan and Segistan; 2. Kandahar, or the eastern provinces; 3. Farsistan, or the western provinces; and, 4. Georgia. The latter, for the most part, retained its own princes, who, at length, submitted to Russia. In Kandahar and the East, Ahmed Abdallah founded the empire of Afghanistan. (q. v.) He was victorious at Panniput, and ruled with absolute sway in India. His residence was Kabul. He was succeeded, in 1753, by Timur; the latter by Zeman. In the two other kingdoms, the Curd Kerim Khan, who had served under Nadir, and was of low extraction, succeeded in establishing tranquillity, after long and bloody wars, by subduing Mohammed Khan, who fled, and perished at Mazanderan. His wisdom, justice, and warlike skill gained him the love of his subjects and the esteem of his neighbours. He did not call himself *khan*, but *vekil* (regent). He fixed his residence at Shiraz in 1755, and died in 1779. New disturbances arose after his death. His brothers attempted to get possession of the throne, to the exclusion of his sons. A prince of the blood, Ali Murat, occupied it in 1784; but a eunuch, Aga Mohammed, a man of ancient family and uncommon qualities, had made himself independent in Mazanderan. Ali Murat, who marched against him, died in consequence of a fall from his horse, and left the sceptre to his son Yafar, who was defeated by Aga Mohammed at Jezd Kast, and fled to Shiraz, where he perished in an insurrection. His son Luthf Ali made several desperate efforts to recover his throne; but Aga Mohammed was victorious, and appointed his nephew Baba Khan his successor, who his reigned since 1796, under the name of *Feth Ali Shah*. He fixed his residence at Teheran, in order to be nearer the Russians, who threatened him in Georgia and the neigbouring provinces. By the peace of 1812, the Persians were obliged to cede to Russia the whole of Daghestan, the Khanats of Kuba, Shirvan, Baku, Salian, Talishah, Karaachb, and Gandsha, resigning all claims to Shularegi, Kharthli, Kachethi, Imeritia, Guria, Mingrelia, and Abchasia, and were obliged to admit the Russian flag on the Caspian sea. (See *Russia*.) Feth Ali (born in 1768), a Turkoman of the tribe of Kadshar Shah, was induced by the heir-apparent, Abbas Mirza, and his favourite Hussein Kuli Khan, who believed Russia to be involved in domestic troubles, to attack that power in 1826. The Persians invaded the Russian territories, without a declaration of war, instigated part of the Mohammedan population to insurrection, and advanced as far as Elisabethpol; but they were defeated in several battles, and the Russians under Paskewitch conquered the country to the Araxes, which, by the treaty of Tourkmantchai (1828) was ceded to Russia. (See *Russia*.) The cholera morbus made great ravages in the northwestern part of Persia in 1829 and 1830. According to the latest accounts, the country was disturbed by the contests of the royal princes. The British always maintain an embassy at the capital, to counteract the influence of Russia.

See Malcolm's *History of Persia* (2 vols., 2d ed., 1829), and his *Sketches of Persia* (1828). Respecting Western Persia, we owe the latest accounts since Chardin, Niebuhr, Olivier, to Kinneir, Morier, Ouseley, and particularly to Ker Porter, and Price's Journal of the British Embassy to Persia (London, 1825). Price was secretary to Ouseley's embassy. J. B. Fraser, in his Narrative of a Journey into Khorassan, 1821—1822 (London, 1825, 1 vol., 4to), describes the general state of Persia. The Adventures of Haji Baba of Ispahan, by Morier, and J. B. Fraser's two works—Kuzzilbash, and the Persian Adventurer, being the Sequel of Kuzzilbash—are interesting delineations of Persian manners. The great influence of Britain in Persia appears from G. Keppel's Journey from India to Britain, by Bassorah, Babylon, Curdistan, Persia, &c., in 1824 (London, 1827, 4to). Drouville's *Voyage en Perse* (2d edit., Paris, 1825, 2 vols.) contains valuable information: see also the *Letters on the Caucasus and Georgia*, by Freygang, Russian consul-general (in French, Hamburg, 1816). Bucet's and Balbe's New Map of Persia (Paris, 1826) is accompanied by an historical and statistical sketch of the monarchy.

Persian Language, Literature and Ancient Religion.—In the Persian provinces, which had previously formed the kingdom of Media, the Zend and Pehlvi, or Pehlevi, were the prevailing languages; the former in the north, the latter in the south of Media. *Zend* is a Pehlvi word, signifying *living*. In the Zend, which is no where mentioned as a spoken, but only as a sacred language, Zoroaster or Zerdusht, wrote his religious books, with which Anquetil du Perron made us better acquainted, so far as they are extant, under the name of *Zendavesta* or the *living word*. Sir W. Jones was informed by a learned disciple of Zoroaster, that *Zend* is the name of the character in which the books are written, and *Avesta* the name of the language. It appears to have been extinct before the beginning of the vulgar era; and among the Guebers, who adhere to the doctrines of Zoroaster, there are at present very few who are acquainted with it. The Zend, both in its grammatical construction, and its radical words, bears a great resemblance to the Sanscrit and Teutonic languages. (See *Rask*.) The Pehlvi, that is, the language of heroes, which was first spoken nearly contemporarily with the Zend, at first in Media or Parthia (in the language of the country, *Pehlo* or *Pehluwan*), and seems to have been closely allied with the Georgian and Aramæan, attained to a high degree of perfection, and became, under the Parthian kings, the common language of the nobility and higher classes, but gave way to the Parsee when the seat of the empire was transferred to the southern provinces, and the Sassanides prohibited its use. According to some vague reports, it is still spoken by a wandering tribe of Shirvan (the Puddars). Among the Guebers there are only a few who understand it. The writings of Zoroaster were early translated into the Pehlvi: there are also some theological and historical writings extant in it, several of which Ouseley has brought to Europe. Under the Sassanides, the soft, rich, and expressive language of Fars or Farsistan (the Parsee), became the prevailing language in Persia: from it sprung the modern Persian, and from the two was formed the rude Curd dialect. The Parsee, or the pure language of Farsistan, bears traces of a common origin with the Sanscrit; although we do not assume, with Schlegel, that the Sanscrit is the mother of the Parsee, nor with Frank, that the Parsee is the mother of the Sanscrit; the latter of which opinions, however, appears the more probable, on account of the greater simplicity of the Parsee. We find the Parsee tolerably pure in Ferdusi, and other authors of the first century of the Mohammedan era, though not entirely free from mixture with the Arabic. This mixture took place after the conquest of Persia by the Arabs, when Mohammedanism became the prevailing religion of Persia, and Arabic the learned language of the country. The addition, not only of single words, but even of whole phrases, was owing partly to necessity, —because words were wanting in Parsee to express many new ideas,—and partly to an affectation of elegance. In this manner was formed the modern Persian. The Arabian words which it contains have, in some instances, remained unchanged, and have sometimes been changed and inflected in the Persian manner. The resemblance between the Persian and Teutonic is not so great, that a German could, as Leibnitz said, at once understand whole Persian verses, but it is certainly striking, and proves, without justifying us in adopting useless hypotheses, that the German, which came from Asia, sprung from the same source with the language of the early inhabitants of Persia. The same is true of the Celts, Sclavonians, and Thracians, of whose languages traces are also to be found in the Persian. According to Hammer, the present Persian is, of all the Eastern languages, the most nearly allied to the German. In the country which, according to Mirchond, was anciently called *Germania*, and, according to Eddussi, *Erman*, the old Persian is the native dialect; so that the name *Germani* is not of Roman origin. In the simplicity of its grammatical construction, the Persian language resembles the English; in its power of compounding words, the German. We pass over the dialects of the Persian language, merely mentioning that the most cultivated of them, the refined Parsee, which has become the language of the court and of literature, is called *Deri* (court language, from *dar*, door), and that the popular language is called *Valaat*.

The written character of the Persian language is the Arabic, with the addition of four letters with three points, which are not in the Arabic. Their books are most frequently written in the character called *Talik*. The Persian literature, of which the Magi were in possession until the introduction of Mohammedanism, has nothing to show in its old dialects, the Zend and Pehlvi, but the works above-mentioned, and the Persepolitan inscriptions, which are in part unintelligible. What escaped destruction in the time of Alexander, was destroyed under the caliphs, and a few fragments only were preserved among the fugitive Parsees or Guebers. Persian civilization declined during the first period of the Arabian dominion; even in the tenth century, no traces of any literature are to be found among the Persians. Learning first revived in Persia in the time of the Abassides, and Arabian literature was already on the decline, when the Persian, favoured by the Bouides and Seljooks, revived. Among the princes who encouraged learned men and poets by personal favour and rewards, the Bouide Azad Eddaulet, in the middle of the tenth century, the Gaznavide sultans Mahmood Sebektechin and Keder Ben Ibrahim, and the Seljook sultan Malek Shah, with his vizier Nazam el Maluk, and Keder Chan Chacan, deserve to be mentioned. The flourishing period of literature continued till the time of Gengis Khan, in the thirteenth century. Under Timur, in the fourteenth century, and the Turks, in the fifteenth, it continually declined, and in the sixteenth, was almost entirely extinct. The oppressions and disturbances to which Persia has since been continually subject, have prevented the revival of learning. The old Persian language is now almost superseded by the Turkish; the Parsees alone speak it. But the Persians possess rich literary treasures of the earlier periods, particularly in poetry, history, geography, &c. We must limit ourselves chiefly to a notice of that portion which has been touched by Europeans.

The most brilliant part of Persian literature is poetry. (See Hammer's *History of Persian Polite Literature* in German, Vienna, 1818). Among the poets are the following: Rudigi, the father of modern Persian poetry, who translated in verse Pilpay's fables; the epic poet Ferdusi, author of the *Shahnameh*, or Book of Kings (of which Gorres has given an abridgment), who lived at the beginning of the eleventh century; and his contemporaries, the celebrated lyric poets, Ansari (the first king of poets) and Ahmed Essedi of Thus. Also distinguished as lyric poets are Anweri or Enweri, of Bednah, in Khorasan (died 1200), who was unsurpassed in the *Cafide*, and inferior only to Hafiz in the ode (two of his poems are contained in the Asiatic Miscellanies); Chakani, his contemporary and rival; Chodscha Hafiz Schemseddin Mohammed, best known under the name of *Hafiz;* Shahi, probably a pupil of Djami; Hatefi, Emir Chosrou, Senai, Shefali, and many other writers of the divan, who are mentioned in Hammer's work above referred to. To the lyric poets of Persia also belong the Turkish emperor Selim I., the unfortunate Shah Allum (see Franklin's *Life of Shah Allum*), and the Shah Feth Ali. As a lyric mystic and moral poet, Sheik Sadi is the most celebrated, not only in the East, but also among us. Ferideddin Attar, a contemporary of Sadi's, was the author of a very valuable collection of proverbs, under the title of *Pendnameh* (Book of Counsel),— of which Sylvestre de Sacy has published a complete edition,—and of several other poetical works. Jelaleddin Roumi of Balk, in Khorasan, is esteemed the most perfect model of the mystic school: he formed a sect, and died 1262, a pious Sophi. His great work, *Kilat el Metnavi* (Collection of Distichs), is so difficult to be understood, that a glossary is necessary. One of the most prolific and pleasing poets of Persia is Abdalrahman, or Abdurrahman Ebn Achmed, more known under his surname of *Molla Djamy*. (See *Jamy*.) To the poets of the first class belongs Nizam, or Nisami, at the end of the sixteenth century, author of five poems, three of which, *Chosrou and Shirin*, *Leila and Mejnoun*, and the History of Alexander, *Iskandèrnameh*, are epics. Some tales and fables selected from his Book of Fortune, have appeared in the original and in translations. If we were willing to enumerate merely names, we might mention Khosru, or Chosrou, of Delhi, Abubatha of Kerman, and Nani, each of whom wrote five long poems; Mir Ali of Shirvan, Achmed of Kirvan, and Emir Soliman, each celebrated as the writer of a history of Alexander; and many others. Instead of drawing up such a mere catalogue, we refer to Hammer's valuable work. Sources of information concerning the Persian poets, are the *Beharistan* of Jamy, the works of Haji Chalfa, the lives by the Persian Dauletshah, continued by Sam Mirza, under the title *Teskiretelchoara* (of which some extracts may be found in the *Notices et Extraits des Manuscrits*, &c., by Sylvestre de Sacy), and the *Ateshkede* (Fire Temple), by Haji Lotfali Beg, surnamed Azir. The most celebrated recent Persian poet, Blab Phelair, died in 1825, at the age of 96 He left astronomical, moral, political, and literary works. He is called the *Persian Voltaire*.

Not less numerous are the prose fables, tales and narratives. Among these are the *Anwar Soheili*, a Persian translation of the fables of Pilpay; the *Bahar Danuch* of Einajut Doollah (translated by John Scott, under the title of Garden of Knowledge, 1799, 3 vols.): the *Tootinameh*, or Tales of a Parrot (Persian and English, by Hadley); the Tales of Bakhtyar and the Ten Vizlers, &c., translated by Ouseley. Other similar works have been given us by Scott, in his Tales, Anecdotes and Letters, translated from the Arabic and Persian (1800); by Langles, in his *Contes, Sentences et Fables, tirées d'Auteurs Arabes et Persans* (1788), and in other collections of this kind. In the departments of history, geography, and statistics, the Persians have some large and valuable works. Abu Said, or Abdallah Ben Abulkasin Beidavi, wrote a universal history, from Adam to his own time (1276), under the title of Historical Pearl Necklace. Andrew Muller has published, in Persian and Latin, the eighth part of this work, which contains the history of China. Turan Shah, who died at Ormuz, 1377, wrote a *Shahnameh*, of which an abstract is given in Pedro Texeira's *Relaciones del Origen Descendancia y Succesion de los Reyes de Persia y de Hormuz* (Antwerp, 1610). Mirchond or Mohammed Ebn Emir Chowand Shah, who flourished in 1741, wrote the voluminous historical work entitled *Hortus Puritatis in Historia Prophetarum, Regum et Chalifarum* (Garden of Purity in the History of the Prophets, Kings and Caliphs), of which, besides the fragment in Wilkins's Persian Grammar, four extracts have been published—in the History of the Persian Kings, by Jenisch (Vienna, Persian and Latin); the History of the Sassanides, in French only, by De Sacy, in his *Mémoires sur diverses Antiquités de la Perse*; the History of the Samanidæ, by Wilken (Persian and Latin, Gottingen, 4to); and the History of the Dynasty of the Ishmaelites, by Jourdain, in his *Notice de l'Histoire universelle de Mirkond*, &c. (Paris, 1814, Persian and French). Mirchond's son, Khondémir, or Gayyetheddin Ben Hamadeddin, wrote a *Compendium Historiæ universalis Mohammedanæ* (Abridgment of Mohammedan History), still in manuscript. The *Tarik el Tabari* (a History of Nations and Kings) was originally written in Arabic, by Mohammed Ebn Giaffir Mahomed Ben Gerir, but is now extant only in a Turkish translation, and in the Persian translation of Balami. The *Lebtarik* (Marrow of History) of Al Emir Yahia Ebn Abdullatif al Kazwini (who died 1351) has been translated into Latin by Gaulmin and Galland. Of Mohammed Kasim Ferishta, we have two valuable works, one of which has been translated into English by Dow, under the title History of Hindoostan (London, 1768, 3 vols., 4to), and the other by John Scott, under the title of History of Dekkan (1794, 2 vols., 4to). The *Tuzuki Jehan Guir*, written by the emperor Jehan Guir, is very valuable in regard to the history and geography of Hindoostan; of which Gladwin has given extracts in the Asiatic Miscellany; but the most important work is the *Akbarnameh* of the vizier Abul Fazl (put to death 1604), the most elegant writer of Hindoostan, written by command of the emperor Akbar. The two first parts of this work contain a history of Akbar and his predecessors; the third, entitled *Ayeen Akbari*, contains a geographical, statistical and historical description of Hindoostan, with much other information. Of this third part, Gladwin has published extracts, under the title *Ayeen Akbery*, or Institutes of the Emperor Akbar. Abul Fazl also translated the fables attributed to Vishnu Sarma from the Sanscrit into the Persian. Of the Annals of Asem of Kufa, Ouseley has given some extracts in his Oriental Collections, which make us desirous of the whole. We are indebted to the same learned Orientalist for an Epitome of the ancient History of Persia, extracted and translated from *Jehan Ara*, a Persian Manuscript (London, 1799). The History of the Persian Empire, by Alomri, from original sources, has not yet been edited. There are numerous works, comprising short periods of time, as single dynasties and single reigns. The *Tarik Ali Mosaffer* contains a history of the seven kings of the Mosaffer family. Shah Babur left valuable commentaries concerning Hindoostan, translated into Persian by Abdul Rahim (English by doctor Leyden and Mr Erskine). Abul Rizak wrote a life of the Shah Rokh and his successors, and the history of his embassy to China and Hindoostan, the latter of which has been translated by Langles in his *Collection portative des Voyages*. Mevana Abdallah Ibn Faziellah, surnamed *al Wafi*, wrote, in the thirteenth and fourteenth centuries, a history of Gengis Khan and his successors till 1336. Sherifoddin, or Molla Sherifoddin Ali Yezdi (died 1446), wrote a biography of Timur, full of fables, translated into French, by Petit de la Croix (Paris, 1724), whose son also wrote, from Persian sources, a *Histoire du grand Genghiz Chan*. Sir W. Jones translated into French a history of Nadir Shah, by Mirza Mohammed Mahadi Chan of Masandaran. Gladwin translated another history of the same prince, by Abdul Kurreem of Cashmere, entitled *Beyoni Uaki* (Necessary Information); and Langles has given an abstract of this author's Pilgrimage to Mecca, in his *Collection*. Lastly, James Fraser has also written a history of Nadir Shah (London, 1742). Here we may mention the *Tuzukati Timur*, translated by Davy, and edited by White, under the title, Institutes political and military, written originally in the Mogul language, by the great Timur, translated into Persian by Abu Talib Alhusseini, and thence into English (Oxford, 1783, 4to).

As to the geographical works in the Persian language, Ouseley has published a fragment of the *Cleimat* (the seven climates), in his Oriental Collections, and an abstract of the Persian translation of the geography, written in Arabic, by Ibn Haukal. Upon chronology, Gravius (Greaves) published a valuable Persian work, *Epochæ Celebriores* (Persian and Latin, London, 1650). No work of the Persian physicians has been translated; but we may mention the valuable work of Abulmansur Mowafin Ben Ali, which is in Vienna. Geometry and astronomy were also cultivated with ardour by the Persians. Nasereddin of Thus translated, and Maimon Raschid commented upon Euclid. Omar Chehan (in 1072), in the reign of Malek Shah, calculated the solar year at 365 days, 5 hours, 48 minutes and 48 seconds; and among the astronomical tables, computed by Persians, the most valuable are those prepared by Nasereddin, at the command of Hulaku Ilekan, and called by his name, but not completed till five years after Ilekan's death (1269), and those drawn up in the first half of the fifteenth century, under the superintendence of Ulug Beigh, by a large number of astronomers, and which were published by Greaves and Hyde. Hulaku Ilekan (1259) established an astronomical academy at Maragha, and erected an observatory, of which Nasereddin had the superintendence. Ulug Beigh also erected one at Samarcand. A Persian calendar, under the title *Ruznameh nauruz*, has likewise been printed. (See *Epoch*, p. 552.) We must also mention Beck's *Ephemerides Persarum per totum Annum* (Vienna, 1695, folio), and Welch's *Tabulæ Æquinoctiales* (Augsburg, 1676, 4to).

The works upon Mohammed, the Mohammedan religion, the legends of the saints, &c., are numerous, but for us of little interest. The Persian abridgment of the Vedas, entitled *Oupnek'hat*, although almost unintelligible by us (translated into Latin by Anquetil du Perron, 1804, 2 vols, 4to.), and the *Desatir* (q. v.), are important monuments. The Pentateuch of Moses in the Persian language, translated by a Jew of Thus, is in Walton's Polyglot. Of the Gospels there are two translations; one in the Polyglot above-named, and the other published by Wheelock (London, 1657, fol.). Their value has been indicated by Rosenmuller.

The Persians have paid great attention to their own language: of this, the number of lexicographical and grammatical works extant affords abundant proof. The small Persian-Turkish dictionary of Shahidi is only for beginners. That of Ardeshir is more celebrated, and also the *Naëmet Allah* (Delight of God), adopted by Castellus as the basis of his; but the two most celebrated are the *Ferhangi Jehan Guir*, and the *Ferhangi Schuari*. The latter was published in 1742, and another by Seid Ahmed, in 1804, at Constantinople. This view is sufficient to show the importance of the Persian language, since, besides being in the East, especially in India, what the French is in Europe, it possesses valuable treasures, not only of native literature, but also of translations from the Arabic, different Indian and other languages, the originals of some of which are lost, and of others, are inaccessible to us. We are also copiously supplied with aids in this study. The grammars of Jones and Richardson (not to mention earlier ones) are now surpassed by Gladwin's *Persian Moonshee*, and especially by Lumsden's Persian Grammar (2 vols., fol.) In Germany, Wilken has published the best Persian grammar. Of the dictionaries the most complete are *Meninski Lexicon Arabico-Persico-Turcicum* (2d edit., 4 vols., folio). Richardson's Dictionary, Persian, English and Arabic, &c., a new edition, with additions and improvements, by Wilkins (London, 1806, 2 vols., 4to); Barretto's Persian and Arabic Dictionary (2 vols.); and Hopkins's Abridgment of Richardson (in 1 vol., 1810), are the best. Much valuable information is contained in Jones's Commentaries; Ouseley's Oriental Collections, and Persian Miscellanies; Gladwin's Dissertations on the Rhetoric, Prosody and Rhyme of the Persians; in the *Fundgruben des Orients* (Mines of the East); in the valuable works of J. von Hammer, &c. See *Oriental Literature*.

PERSIAN ÆRA. See *Epoch*.

PERSIAN GULF; a sea, or inland lake, bounded by Persia and Arabia, except at the eastern extremity, where it communicates with the Arabian sea; about 500 miles from east to west, and from 120 to 250 from north to south. The principal river which runs into it is the Euphrates. The south coast, in particular, is celebrated for its pearl fishery. Most of the coast belongs to colonies of Arabians.

PERSIAN WHEEL. See *Wheel, Persian*.

PERSIUS. Aulus Persius Flaccus, a Roman satirical poet, was born, A. D. 34, at Volterra, in Etruria, and died in 62. According to some, Luna was his birth-place. His family was of the equestrian order, and he received his education at Rome. He was on friendly terms with some of the most eminent men of the time, and was much beloved on account of the purity and amenity of his manners. He died at the age of twenty-eight years. The Stoic Cornutus, one of his first teachers, published six satires by him, which present a picture of the prevailing corruption, in contrast with the standard of Stoic wisdom and the old Roman severity. They are distinguished for vigour, conciseness, and austerity of tone. Their obscurity arises in part from their allusions to subjects now unknown, and in part from their abrupt and concise style. They are usually published with the satires of Juvenal. The best editions are those of Casaubon (Leyden, 1695) and Konig (Gottingen, 1804), with commentaries. Dryden and Gifford, among others, have translated them into English. Madan's edition of Juvenal and Persius, with a prose translation and English notes (1789), was reprinted in 1813.

PERSONIFICATION, in the fine arts, poetry and rhetoric; the representation of an inanimate subject as a person. This may be done, in poetry and rhetoric, either by giving epithets to inanimate subjects which properly belong only to persons, or by representing them as actually performing the part of animated beings. In the latter case, the name *prosopopœia* is also used. Strictly speaking, we may be said to *personify* whenever we apply an epithet expressive of life to an inanimate subject, as *awakening nature, raging storm*; but a little reflection will show us that ordinary language is full of personifications of this kind—nay we could not speak without them. The word *personification* is therefore generally applied only to a formal representation of a thing as a person. The more the imagination prevails among a people, the more common are personifications. Take, for instance, the tales of the Arabs. As reflection acquires the ascendency, personifications are less used. Many of the mythuses are personifications of powers of nature or events of history.

PERSPECTIVE; the art of copying the appearance of objects, as seen from a certain point of view. It enables the artist to represent objects on a given surface, as if the surface were transparent, and the objects were seen through it. As we see by means of the rays of light which proceed in straight lines from the objects, to our eyes, perspective rests on optical principles. As the drawing of the form of an object is an arrangement of lines and angles according to geometrical principles, perspective may be considered as a branch of geometry. That part of perspective which relates to the form of the objects differs essentially from that which teaches the gradation of colours according to the relative distance of objects. Hence perspective is divided into *mathematical*, or *linear perspective*, and the perspective of colour, or *aerial perspective*. Both are of the greatest importance to painters, architects, sculptors, &c. Without a correct observance of the rules of perspective, no picture can have truth and life. Perspective alone enables us to represent foreshortenings with accuracy, and it is requisite in delineating even the simplest positions of objects. As long, therefore, as its rules were unknown, the act of drawing necessarily remained in its infancy. This art has been most cultivated in modern times; yet the paintings found in Herculaneum prove that the ancient Greek painters were acquainted with it in some measure.

The contour of an object, drawn upon paper or canvass, represents nothing more than such an intersection of the visual rays, sent from the extremities of it to the eye, as would arise on a glass put in the place of the paper or canvass. Now the situation of an object at the other side of a glass being given, the delineation of it on the glass itself depends entirely on the situation of the eye on this side of the glass; in other words, *on the rules of perspective.* Suppose a spectator to be looking at a prospect without doors from within through a glass window; he will perceive the shape, size and situation of every object visible upon the glass. If the objects are near the window the spaces they occupy on the glass will be larger than when they are at a greater distance; if they are parallel to the window, their shapes upon the glass will be parallel likewise; if they are oblique, their shapes will be oblique; and so on. As he alters the situation of his eye, the situation of the objects upon the window will be altered also; if he raises his eye, the objects will seem to rise higher upon the window, and the contrary if he lowers it. The horizon will, in every situation of the eye, be upon a level with it; that is, the imaginary line which parts the earth and sky will seem to be raised as far above the ground upon which the spectator stands as his eye is. Now suppose the person at the window, keeping his head steady, draws the figure of an object seen through it upon the glass with a pencil, as if the point of the pencil touched the object; he would then have a true representation of the object in perspective, as it appears to his eye. To every person who possesses a general knowledge of the principles of optics, this must be self-evident; for as vision is occasioned by pencils of rays coming in straight lines to the eye from every point of the visible object, it is plain that, by joining the points in the transparent plane through which all those pencils respectively pass, an exact representation must be formed of the object, as it appears to the eye in that particular position, and at that determined distance. And were pictures of things to be always first drawn on transparent planes, this simple operation, with the principle on which it is founded, would comprise the whole theory and practice of perspective. As this, however, is far from being the case, rules must be deduced from optics and geometry for drawing representations of visible objects on opaque planes; and the application of these rules constitutes what is properly called the *art* of perspective. There are used in perspective a certain number of terms peculiar to the art, definitions of which are necessary to an intelligent use of them. The *original object* is that which is made the subject of the picture. *Original planes*, or *lines* are the surfaces or lines of original objects. The *point of view* is the situation of the eye. The *point of sight* is the point in the perspective plane which is nearest to the eye. As far as the picture is concerned, these two points coincide, so that some authors have used them indiscriminately one for the other. The point of sight is also called the *centre* of the picture. A *visual ray* is a line from the object to the eye. If the object is a point, there is but one visual ray; if it is a line, the visual rays form a triangle; if it is a square, they form a pyramid; if a circle, a cone, &c. The principal visual ray is that from the nearest point in the picture, or point of sight. The *perspective plane* is the surface on which the picture is delineated; or it is the transparent surface through which we suppose objects to be viewed. The *directing plane* is a plane supposed to pass through the eye of the spectator, parallel to the perspective plane. The *ground plane* is the earth, or the plane surface on which the spectator and objects are situated. The *horizon*, or *horizontal plane*, is one parallel to the ground plane, and at the height of the spectator's eye. The *horizontal line* is the intersection of the picture, or perspective plane, with the horizontal plane. The *ground line* is the intersection of the perspective plane with the ground plane; or it is the line on which the picture is supposed to stand. The *perpendicular* is a line on the perspective plane, drawn through the point of sight, perpendicular to the ground line and horizontal line. The *points of distance* are points on the perspective plane, set off from the point of sight, sometimes on the horizontal line, and sometimes on the perpendicular, at the same distance from the point of sight that the eye is supposed to be at from the perspective plane.

Projections. The projections of a body are the different modes by which it may be delineated on a plane surface. *Scenographic* projection represents objects as they actually appear to the eye at limited distances. *Orthographic* projection represents objects as they would appear to the eye at an infinite distance, the rays which proceed from them being parallel, instead of converging. The shadow which a body casts in the rays of the sun may be considered as an orthographic projection. In this projection, lines which are parallel in the original are parallel in the picture, and do not converge to any vanishing point. Their comparative length, also, is not affected by difference of apparent distance. Orthographic projection is much used in delineating buildings, machinery, &c., because those parts of the drawing which are not foreshortened maintain their true relative size, so that measures can be taken from them. The term *ichnographic* projection is sometimes used to express the horizontal delineation, or ground plan, of an object. A *bird's eye view* is a scenographic or orthographic projection, taken from an elevated point in the air, from which the eye is supposed to look down upon the objects. Geometrical and mechanical methods will enable a person not previously conversant with the art to obtain correct perspective representations of any object. But by long practice in drawing from nature a certain tact is acquired by painters, which enables them, by the accuracy of the eye and judgment alone, to make correct views of objects, without the aid of any computation or mechanical process. Thus miniature painters produce the nicest resemblance of the human countenance, in any position, with no other guide than the faculty obtained by experience of estimating the exact shape and proportion which each part of the original should bear upon the picture.

Equally important with the linear perspective is *aerial perspective*, though not founded on equally demonstrable rules. It teaches how to judge of the degree of light which objects reflect in proportion to their distance, and of the gradation of their tints in proportion to the intervening air. The nearest objects only appear in their true colours and full light. In the case of the more distant, the light and colour become blended with the colours of the vapours which fill the air, in proportion to their distance, until, at last, the objects become lost in an indistinct mass, of a blueish tinge, in the horizon, whilst their colour and that of the air become one. The proportion of this *degradation*, as it is called, is regulated by the purity of the air, being greater according as there is more vapour in the air. Hence distant objects in a clear southern air appear much nearer than they really are, to an eye accustomed to a thick northern atmosphere. As the air changes, the aerial perspective must change. Morning, noon, evening, moonshine, winter, summer, the sea, &c., all have their different aerial perspective. In aerial perspective, the weakening of the tints corresponds to the foreshortening of the receding lines in linear perspective. In the illuminated parts of objects, the tints are represented more broken and fluctuating. The shaded parts are often aided by reflection. If the degree of the density of the air is given, the degrees of these gradations may also be determined; not by mathematical rules indeed, but by close observation of nature. By aerial perspective two results are obtained:—1. Each object in a picture receives that degree of colour and light which belongs to its distance from the eye: 2. The various local tones are made to unite in one chief tone, which is nothing else than the common colour of the air, and the light which penetrates it. The charm and harmony of a picture, particularly of a landscape, depend greatly upon a correct application of aerial perspective. Aerial perspective is hardly found at all in the productions of the ancient German and Italian schools to the time of Perugino.

The methods of perspective commonly practised are extremely complex and difficult to follow. We have pleasure in presenting to the reader an account of a method lately invented by Mr James Whitelaw, Glasgow, who has favoured us with the description and illustrations. The account will be found clear and complete, and when it is recollected that large volumes are necessary to explain perspective drawing on the old plan, the brevity of the following account is a sufficient proof of the superior simplicity of the method it describes.

1. If a person behind a transparent plane kept his eye exactly in the same position till he traced on the plane the objects on the other side of it by means of a pencil carried over the parts of the plane where the rays of light reflected to the eye from all the lines in the objects cut the plane, the delineation would be a *perspective drawing* of the objects. See Pl. LXV.

2. Fig. 24 is a ground plan of a number of objects, marked *a*, *b*, *c*, *d*, standing on a horizontal surface; the same letters in fig. 25 point out the same objects in the elevation; and fig. 26 is a perspective view of them. Before going farther, I may remark, that when a *line* is spoken of in this paper it is a *straight line* that is meant, unless the contrary be mentioned.

3. In order to draw the perspective view, make first the ground plan and elevation as in figs. 1 and 2, then draw a line *f g*, in fig. 24, to represent the transparent plane which stands perpendicular to the surface on which the objects *a*, *b*, &c., stand, and after this fix upon the point *e*, in the same fig. for the position of the eye. But before making a full view it may be as well to illustrate the method by finding the perspective of a line, and as the line *h i*, in fig. 24, plate LXV., which stands perpendicular to the transparent plane is as good as any other, we shall commence with it. The point *h*, which marks the position of *h i*, in the elevation, is on a level with the eye. From the ends of the line *h i*, draw the lines *h e* and *i e* to *e*, the *point of sight*, and the part *l h* of the transparent plane, or *picture sheet*, contained between the lines *h e* and *i e*, will be the perspective in the ground plan of the line *h i*, because the lines *h e* and *i e* represent the rays of light reflected to the eye from the ends of the line *h i*. From what is now said, it will be evident that *l n* shows the perspective in the ground plan of the part *i m*, of the line *h i*; and *n h* is the perspective in the same plan of *h m*, the other part of *h i*. If a line be drawn through *e*, parallel to *h i*, till it meets the picture-sheet in *p*; *p h* will show, in fig. 24, the perspective of the line *h i*, if it is indefinitely extended beyond the point *i*. For, by inspecting the ground plan, it will be seen that the more distant from the picture-sheet any point *i*, is taken, the line drawn from the point to the eye becomes more nearly parallel to *e p*; and in consequence of this, *p l* becomes smaller, the more distant the point is taken. And although we cannot name a distance from the picture-sheet for the position of the point *i*, that will make *p* and *l* exactly coincide, yet we can place *i* so distant, that the space betwixt *p* and *l* will be smaller than any quantity that we can form a notion of, and for this reason *p h* must be considered the perspective in the ground plan of the line *h i*, when it is indefinitely extended from the point *h*, in fig. 24, or from the point *h*, in the elevation which is on a level with *e*, the point of sight in the same view.

4. We now know how to represent on an edge view of the transparent plane, or picture-sheet, the perspective of any line, or part of a line, running perpendicular to the transparent plane, and on the same level with the eye; but in order to make a picture, the perspectives of the lines in the objects to be represented, must be shown not on an edge, but on an elevation of the picture-sheet. Let fig. 26 be this elevation; then through the lowest points of the objects shown in fig. 25, draw the level line *f g*, in figs. 25 and 26. The part of *f g*, which is under the elevation, will represent a horizontal surface, passing through the lowest point of the objects to be shown in perspective, and if the bottom ends of the objects are on the same level as in figs. 24 and 25, this line shows the horizontal surface on which the objects stand, while the part of the line, *f g*, which passes under the perspective view, will represent the intersection of the transparent plane with this horizontal surface. I may remark just now, that the ground plan is drawn in such a position that the line *f g*, in figs. 25 and 26, is parallel to the line marked *f g*, in fig. 24; and I may further notice, that these lines are drawn parallel to the top or bottom edges of the drawing-board, so that if a line is wanted to be drawn either parallel or perpendicular to these lines, the thing is done at once by applying a T square to the edge of the drawing-board. If a line be drawn perpendicular to *f g*, in figs. 25 and 26, through *p*, or, which comes to the same thing, through *e*, in the ground plan, and if another line be drawn through *e*, which marks the place of the eye, as also the place of the point *p*, in fig. 25, parallel to the same line *f g*, and cutting the perpendicular line *e e*, in *e*; *e*, in the perspective view, is the position of the point *p*, shown in the ground plan. Now, if we let fall perpendicular lines from the points *h n* and *l*, in fig. 24, to the line *f g*, in figs. 25 and 26, and then produce the horizontal line *e e*, till it cuts the perpendicular lines *h q*, *n t*, and *l n*, in the points *h*, *m*, and *l*, in fig. 26, these points will be the perspectives of the points marked *h*, *m*, and *i*, respectively, in the ground plan. If the points *h* and *l*, in fig. 26, are joined, this line *h l*, will be the perspective of the line *h i*, the part *h m*, of this perspective line, is the perspective of the

part marked *h m*, of the line *h i*, in the ground plan; and a line joining the points *h* and *e*, in fig. 26, is the perspective of the line *h i*, in the ground plan, when it is indefinitely extended in the direction *h i*.

5. Points in contact with the transparent plane must be at the same distance from, and in the same position with respect to, each other in the perspective view, as in the elevation; for the line drawn to the eye, which marks the perspective, can neither converge nor diverge in passing betwixt a point whose perspective is wanted and the picture-sheet, as in this instance there is no distance betwixt the place of the point and the line *f g*, in fig. 24. From this it will be evident, that any line or plane surface in contact with the transparent plane, will have the same shape and dimension in the perspective view as in the elevation. And it will also be seen, that the principal reason why the point marked *e*, in fig. 26, is fixed upon as the place in the perspective view of the point marked *p*, in fig. 24, is, that as this point *e*, is found in the place where a perpendicular let fall from the point *p*, to the line *f g*, in figs. 25 and 26, cuts a horizontal line running through the point *e*, in fig. 25, and the point *e*, in fig. 26, being the perspective of a point in contact with *f g*, in fig. 24, setting it off in this manner will allow the place of any other point of the objects to be shown in perspective which is in contact with the picture-sheet, to be obtained by a similar process, which process is very easily gone through by means of a drawing square. As the part of the line *f g*, which is under fig. 25, represents a horizontal surface, which cuts the transparent plane, the intersection of the picture-sheet and this horizontal plane being a line in contact with the picture-sheet must be shown at the same distance below *e*, in the perspective view, that the part of *f g*, which is under fig. 25, is below the position of the eye, which is also the position in the elevation of the point marked *p*, in the ground plan. As we proceed it will become evident that the part of the line *f g*, which is under the perspective view, is of very great use to set up the height from it which any point in the elevation has above the line *f g*, in figs. 25 and 26, when the elevation cannot conveniently be drawn on the same board with the ground plan and the perspective view. The line *h e*, which shows, in fig. 3, the perspective of the line *h i*, when it runs to an indefinite distance from the picture-sheet, must be a level line, as the point *h*, in fig. 25, at which the line commences, is in a level with the point *e*, the position of *p*, in the same fig., and these points being both in contact with *f g*, in the ground plan, must have the same position in the perspective view that they have in the elevation.

6. Suppose the line *h i*, which runs perpendicular to the picture-sheet, and on a level with the eye, to have its commencement in fig. 24, at the point *l*, instead of the point *h*. By reasoning in the same way, as in paragraph 3, it will be found that *l p* is the perspective in the ground plan of the line *h i*, when it is extended to an indefinite distance beyond the point *l*, in the ground plan. And it will further be found that the nearer to the point *p*, that any line, running perpendicular to the picture-sheet, and on a level with the eye, is taken, the *indefinite perspective* (that is, the perspective of a line when it is indefinitely extended,) will always get shorter, so that if a line, such as *h i*, has its commencement in the point *p*, its indefinite perspective will be shown in the ground plan by the point *p* itself. In the same way it may be shown that *p* is the *vanishing point* (that is, the point which terminates the perspective of a line when it is indefinitely extended,) of any line running perpendicular to the picture-sheet, and in a level with the point of sight, although the line commence at a point *f*, on the different side of the point *p*, from the line *h i*; and the reasoning employed in paragraph 3, will also show that the perspective of any point, in a line so situated, is obtained in the same way in which the perspective of the point marked *m*, in fig. 24, or the point *i*, in the same fig., is found. Or, if a line running perpendicular from the picture-sheet to an indefinite distance beyond it, have its commencement not, as in the above examples, at a part of the picture-sheet on a level with the eye, but in a line passing through the point *p*, and running at right angles to the plane on which the objects *a*, *b*, &c., stand, the vanishing point of a line so situated will be the point *p* in the ground plan, and the point *e*, in fig. 26, in this case also: this may be demonstrated in the same way as the vanishing point of the line *h i*, or any of the other lines running parallel to, and on a level with it, was shown to be the points *p* and *e*, respectively, in figs. 1 and 3. In a similar manner it may be shown, that if any line running perpendicular to the transparent plane, to an indefinite distance beyond it, has its commencement at any point *v*, in fig. 25, which is neither in a horizontal nor a perpendicular line, passing through the position of the eye in the same fig.; the vanishing point of a line so placed is, as in the above examples, the point *p*, in the ground plan; or the point *e*, in the elevation.

7. Let the line *h i*, fig. 24, have its commencement in the elevation at *r*, one of the corners of the cube *a*, its perspective view is found as follows:—From the point *h*, in fig. 24, draw a line *h s*, perpendicular to the line *f g*, in figs. 25 and 26, and from *r*, draw a line *r q*, parallel to *f g*, and the point *q*, where the line *r q* cuts the line *h s*, is the commencement of the perspective of the line *h i*; join *q* with *e*, and this line will be the perspective of the line *h i*, when it is indefinitely extended. A line joining the points *s* and *e* is the perspective of the line *h i*, if it is indefinitely extended, when it has its position in the elevation at the corner which is under *r*, of the cube *a*. The point *s*, where the perspective line *s e* commences, is found in the very same way as the point *q* was found. As *q e* is the perspective of the line *h i*, which runs perpendicular to the picture-sheet, when it is indefinitely extended, from *r*, in fig. 25, one of the top-corners of the cube *a*; and as *s e* is the perspective of *h i*, when it is indefinitely extended, in a direction perpendicular to the picture-sheet, from the corner under *r*, of the cube *a*, in fig. 2, the triangle *q e s* is the perspective of a parallel surface, standing perpendicular to the surface on which the objects *a*, *b*, &c., stand, and running at right angles to the picture sheet, to an indefinite distance from it. The side of the cube *a*, that is towards the centre of the picture, and the same side of the cube under the pyramid, form part of the perspective of this parallel surface. The point *t*, where the line *n t*, let fall from the point *n*, in the ground plan, perpendicular to the line *f g*, in figs. 25 and 26, cuts the line *s e*, is the perspective of the bottom corner at *m*, of the cube *a*; and the place where this same line, *n t*, cuts the perspective line *q e*, is the perspective of the top corner *m*, of the cube marked *a*, in the ground plan. So now we have got the perspectives of the four corners of one of the sides of the cube, in front of the picture; and by joining these corners we get the surface *q t*, and this surface is the perspective of the side of this cube, which is towards the object *d*. A perpendicular, let fall upon the line *f g*, in the elevation and perspective view, from the point *l*, in fig. 24, will cut the lines *q e*, and *s e*, so as to give the perspectives of the top and bottom corners at *i*, of the cube under the pyramid; and the other two corners of the side of this cube, which

is next the object *c*, is obtained in a similar manner; and by joining these corners we get the surface *o u*, which shows, in perspective, the side of the base of the object *b*, marked *o i*, in the ground plan.

8. It may not be plain to every one how that the line, *m w*, in the ground plan, as well as every other line in the objects to be shown in perspective, which runs in a horizontal direction, and parallel to the picture sheet, should be shown by a level line in fig. 26. That this is the case, can very readily be proved, in a line, as above described, but in the position *x y*, in the ground plan, with the points *x* and *y*, which terminate the line, each at the same distance from the line, *e p*, produced. For whether the line *x y* be above, or below, or on the same level with, the eye, the rays of light, proceeding from the whole line *x y*, to the point of sight, form a plane of the shape of an isoceles triangle, having *x y* for its base; and a line joining the points *x* and *e*, will be the one side, while a line joining the points *y* and *e*, will form the other side. But this triangular plane is the surface which gives, by its intersection with the picture sheet, the perspective of the line *x y;* and as *x y* is a level line, and parallel to *f g*, in fig. 24, the line which forms the intersection of the triangular plane with the picture-sheet, must be a horizontal line, which every person, at all acquainted with the properties of parallel lines and the intersection of planes, will see at once. Now, it will be evident that the perspective of any line in a position as *m w*, must be a level line, for *m w* forms a part of a line similarly situated to the line *x q*. Some people think that a line as *x y*, should appear in the perspective view, bent upwards or downward at the ends, from the point in it exactly under or above the point *e*, according as *x y* happens to be below or above the level of the point of sight in the elevation; but this is a mistake; for the perspective of every straight line must be a straight line, as it is formed by the intersection of two planes. By reasoning in the same way as in the former part of this paragraph, it will be seen that every line which stands in a perpendicular direction in the objects to be represented in perspective, will be shown by a perpendicular line in fig. 3. The upright corners of the cubes, and some other lines in the figs. illustrate this.

9. If what is written in the preceding paragraphs be well understood, it will be seen that the different figs. are placed in such a way, that when the perspective of a line, which stands perpendicular to the horizontal surface, passing through the lowest point of the objects to be shown in perspective, and of no particular length, is wanted, we have just to draw a line to the place of the eye, in the ground plan, from the point which marks the position of the perpendicular line in the same fig., and at the point in the picture-sheet where the line, passing betwixt the place of the perpendicular line and the eye, cuts it, let fall a perpendicular line upon *f g*, in figs. 25 and 26, and this line will be the perspective of the line whose perspective is wanted. And when we want to find the perspective of a line running perpendicular to the picture-sheet, from any point in it, we have first to let fall upon *f g*, in figs. 25 and 26, a perpendicular line from the point in the picture-sheet, in fig. 24, where the line, whose perspective is wanted, commences, then we have to draw a horizontal line, to cut this perpendicular line, from the point which marks the place of the line to be shown in perspective, in fig. 26, and the place where this horizontal line cuts the perpendicular line, is the point in fig. 26, where the perspective of the line commences; and joining this point with the point *e*, in the same fig., will give the perspective of the line whose perspective is wanted, when it is indefinitely extended from the point where it commences in the picture-sheet. The following *rule* to find the perspective of any point rests upon the principle, that a point to be shown in perspective, which does not happen to be in the intersection of two lines, the one running perpendicular to the picture-sheet, and the other at right angles to the horizontal surface on which the objects to be drawn in perspective stand, may be supposed to be so situated, and then if the perspectives of these lines, cutting each other in the point whose perspective is wanted, be found, the point where they cross, in fig. 26, will give the perspective of the point.

RULE.—From the place of the point in the ground plan, draw a line to the point of sight, and from the point where this line cuts the picture-sheet, let fall a perpendicular upon the line *f g*, in figs. 25 and 26. After this, from the place of the point in the ground plan, whose perspective is wanted, let fall another perpendicular upon the line *f g*, in figs. 25 and 26, on this perpendicular set up the height that the point stands at in the elevation above the line *f g;* measuring this height from part of *f g*, which is under the perspective view; then, from the height so set up, draw a line to the point *e*, in the perspective view, and the place where this line cuts the perpendicular let fall from the point in the picture-sheet where the line drawn to the eye in the ground plan cuts it, is the perspective of the point wanted. Thus:—suppose that we want to find the perspective of the top point *k*, of the pyramid *q*. From *k* , in the ground plan, draw a line *k e*, to the eye, and from the point *n*, where this line cuts the picture-sheet, let fall a line *n k*, perpendicular to *f g*, in figs. 25 and 26. Then from the point *k*, in fig. 1, let fall a line *k z*, perpendicular to *f g*, in figs. 25 and 26, on this line set up the point *z*, above the line *f g*, at a distance equal to the height that the top *k*, in the elevation of the pyramid, is above the part of *f g*, which is under fig. 25, and from the point *z*, draw a line to *e*, in the perspective view, and the point *k*, where the lines *z e* and *n k* intersect, is the perspective of the top point of the pyramid. As all the lines that run up the sides of the pyramid meet at the top, the perspective view of the pyramid is completed by finding the perspectives of the bottom ends of these lines, and joining as many of the perspective points as are not hid by surfaces in front of them, with the point *k;* and then join these perspective points, the one with the other. The method of drawing the cube in front of the picture, and also the cube on which the pyramid stands, is fully sketched out in the engraving. The six-sided prism *c*, is drawn in perspective, in the very same way as the pyramid, by finding the perspectives of the points at the ends of all the lines in it, and joining these perspective points.

To find the perspective of a circle or any other curve. Mark off, at random, a number of points in the ground plan of the curve, after this, mark off the positions of the same point in the elevation, then find by the *rule* the perspective of each point, and when that is done, connect the perspective points by a line, and this line will be the perspective of the curve. The line which shows the perspective of a curve will be a straight line, when the curve to be shown in perspective is placed in a plane, which if it was produced, would pass through the point of sight. If a circle is placed in a plane, parallel to the picture-sheet, its perspective is a circle. In any other position than the two now mentioned the perspective of a circle is an ellipse, and not two segments of a circle meeting at the ends, which is the way that persons who do not understand the subject draw a circle in perspective.

When the line drawn perpendicular to $f g$, in figs. 25 and 26, from the point in the ground plan, whose perspective is wanted, nearly coincides with the line drawn perpendicular to the same line $f g$, from the point in the picture-sheet, where the line drawn to the eye, from the point in the ground plan cuts it, the height of the perspective of the point cannot be so exactly found by the *rule*, as the line drawn to the point e, in the perspective view, is, in this case, nearly a perpendicular line, and the place where this line cuts the line, let fall perpendicular to $f g$, in figs, 25 and 26, from the point in the picture-sheet where the line drawn to the eye from the place of the point in the ground plan cuts it, is not so exactly marked as when these lines, which mark by their cutting the perspective of the point, cross each other in a direction nearer the perpendicular. When great exactness is wanted in a case of this kind, it will be the better way to find the perspective of a horizontal line, parallel to the picture-sheet, passing through the point whose perspective is wanted, and the place where this perspective line cuts the line drawn perpendicular to the line $f g$, in figs. 25 and 26, from the point in the picture-sheet, where the line drawn from the place of the point in the ground plan to the eye cuts it, is the perspective of the point.

The eye should not be nearer to the picture-sheet than the greatest height or breadth of the picture, and it should be placed in the ground plan, so that a line let fall from it perpendicular to the picture-sheet should bisect the angle $f e g$, formed by lines drawn to it from the points which mark out the greatest width of the picture. The line $e p$, in the ground plan, does not bisect the angle $f e g$; but this was done to save room, and to show some parts of the objects that could not have been so well represented if the position of the eye had been more nearly opposite to the centre of the picture. If the eye is very distant from the picture-sheet a perpendicular let fall from it to the picture-sheet need not fall exactly on the centre of the picture.

If, in the ground plan, or the elevation, one part keeps another out of sight, the part hid must be drawn before its perspective can be made. The dotted lines in the ground plan showing the small moulding on the top of the pillar, and the dotted lines in the same plan, which show the round pannels in the cube that is close to the picture-sheet, illustrate this remark.

When a figure in the objects to be represented is parallel to the transparent plane the perspective of the figure is similar to the original one, but less in magnitude, according to its distance.

If a picture is wanted in which the transparent plane does not stand perpendicular, the easiest way to make it is to consider the picture-sheet perpendicular, and draw the figures corresponding to the ground plan and elevation as if the objects were put off the perpendicular by elevating one side of the horizontal surface passing through the lowest point in them.

Sometimes after the ground plan of any object or number of objects is drawn, it may be considered better not to have the picture-sheet in this plan parallel to the top or bottom edges of the drawing board, but in a direction such as the line $h c$, in fig, 27, is drawn. When this happens draw, as in fig. 24, lines from all the points in the ground plan to d, the point of sight, then let fall perpendicular lines from the same points to the picture-sheet, $h c$; after this draw from a point c, (which is beyond the lines drawn from the place of the points in the ground plan to the picture-sheet.) the line $c e$, parallel to the top or bottom edge of the drawing board. Then from the point c, where the lines $h c$ and $e c$, meet, with a pair of pencil bows draw circles to $e c$, from all points in $h c$, where the perpendicular lines, and the lines drawn to the eye from the points in the ground plan meet it, also the point where a perpendicular let fall from the point d to the picture-sheet, meets it, must be transferred by means of the pencil bows to the line $e c$; and perpendicular to $e c$, from this last point transferred, mark off the point f, at the same distance from $e c$, that d is from $h c$. It will now be evident that transferring the points on $h c$ to $e c$: and settling the point f, in the position mentioned above, produces the same effect as if $h c$, with all the points on it, together with d, the point of sight, moved with the same angular motion round the point c, as a centre, till $h c$ came to the position $e c$. The point d would then coincide with f; and $e c$ would be the picture-sheet with all its points upon it brought into a position parallel to the bottom of the drawing board. When the operation is thus far gone through, the rest of the process is conducted as if the ground plan had been drawn to suit the picture-sheet in the position $e c$. In order that fig. 27 may be fully understood, I need only add that b is an elevation of the object a, in the ground plan, and k is the perspective view of it; g, in the perspective view, being the vanishing point of the lines running perpendicular to the picture-sheet. Rather than draw a perspective view with the position of the picture-sheet in the ground plan inclined to the sides of the drawing board, as in fig. 27, it will be better to shift the blade of the drawing square so as to draw the ground plan of the objects at the required angle to the picture-sheet, when it is in a positon as in fig. 1.

Isometrical Perspective. This is a kind of perspective invented by professor Farish, of Cambridge. We extract, with some modifications, a portion of professor Farish's paper on the subject, which appeared in the first volume of the Transactions of the Cambridge Philosophical Society. The subject has been but little attended to by mechanical draughtsmen, but its importance is becoming daily better known.

After some general remarks on the inadequacy of the common methods of drawing machinery; he states that it is preferable to the common perspective on many accounts, for such purposes. It is much easier and simpler in its principles. It is also, by the help of a common drawing-table, and two rulers, incomparably more easy, and consequently, more accurate in its application; insomuch, that there is no difficulty in giving an almost perfectly correct representation of any object adapted to this perspective, to which the artist has access, if he has a very simple knowledge of its principles, and a little practice.

It further represents the straight lines which lie in the three principal directions, all on the same scale. The right angles contained by such lines are always represented either by angles of sixty degrees, or the supplement of sixty degrees. And this, though it might look like an objection, will appear to be none on the first sight of a drawing on these principles, by any person who has ever looked at a picture. For he cannot for a moment have a doubt, that the angle represented is a right angle, on inspection

And we may observe further, that an angle of sixty degrees is the easiest to draw of any angle in nature. It may be instantly found by any person who has a pair of compasses, and understands the first proposition of Euclid. The representation, also, of circles and wheels, and of the manner in which they act on one another, is very simple and intelligible. The principles of this perspective which, from the peculiar circumstance of its exhibiting the lines in the three principal dimensions on the same scale, we denominate "*Isometrical*," will be understood from the following detail:

Suppose a cube to be the object to be represented. The eye placed in the diagonal of the cube produced. The paper, on which the drawing is to be made to be perpendicular to that diagonal, between the eye and the object, at a due proportional distance from each, according to the scale required. Let the distance of the eye, and consequently that of the paper, be infinitely increased, so that the size of the object may be inconsiderable in respect of it.

It is manifest, that all the lines drawn from any points of the object to the eye may be considered as perpendicular to the picture, which becomes, therefore, a species of orthographic projection. It is manifest, the projection will have for its outline an equiangular and equilateral hexagon, with two vertical sides, and an angle at the top and bottom. The other three lines will be radii drawn from the centre to the lowest angle, and to the two alternate angles; and all these lines and sides will be equal to each other both in the object and representation: and if any other lines parallel to any of the three radii should exist in the object, and be represented in the picture, their representations will bear to one another, and to the rest of the sides of the cube, the same proportion which the lines represented bear to one another in the object.

If any one of them, therefore, be so taken as to bear any required proportion to *its* object, e. g. 1 to 8, as in my representations of my models, the others also will bear the same proportion to *their* objects; that is, the lines parallel to the three radii will be reduced to a scale.

We omit the demonstration of this, and some other points, partly for the sake of brevity, and partly because a geometrician will find no difficulty in demonstrating them himself, from the nature of orthographic projection; and a person, who is not a geometrician, would have no interest in reading a demonstration.

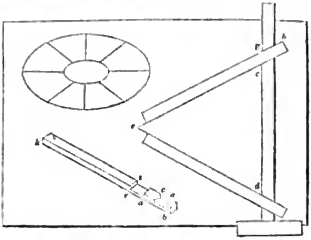
For the same reason, it is unnecessary to show that the three angles at the centre are equal to one another, and each equal to 120 degrees, twice the angle of an equilateral triangle; and the angle contained between any radius and side is sixty degrees, the supplement of the above, and equal to the angle of an equilateral triangle.

In models and machines, most of the lines are actually in the three directions parallel to the sides of a cube, properly placed on the object. And the eye of the artist should be supposed to be placed at an indefinite distance, as before explained, in a diagonal of the cube produced.

The last mentioned line may be called the *line of sight.*

Let a certain point be assumed in the object, as for example, C, fig. 2, and be represented in the picture, to be called the *regulating point.* Through that point on the picture may be drawn a vertical line, C E, fig. 28, plate LXV., and two others, C B, C G, containing with it, and with one another, angles of 120 degrees, to be called the *isometrical lines,* to be distinguished from one another by the names of the *vertical,* the *dexter,* and the *sinister* lines. And the two latter may be called by a common name,—the *horizontal isometrical* lines. Any other lines parallel to them may be called respectively by the same names. The plane passing through the dexter and vertical lines, may be called the *dexter isometrical plane;* that passing through the vertical and sinister lines, the *sinister plane;* and that through the dexter and sinister lines, the *horizontal plane.*

The drawing implements are thus described by the inventor. It is unnecessary to describe the drawing-table any further, than by observing that it ought to be so contrived, as to keep the paper steady on which the drawing is to be made.



There should be a ruler in the form of the letter T to slide on one side of the drawing-table. The ruler should be kept, by small prominences on the under side, from being in immediate contact with the paper, to prevent its blotting the fresh drawn lines as it slides over them. And a second ruler, by means of a groove near one end on its under side, should be made to slide on the first. The groove should be wider than the breadth of the first ruler, and so fitted, that the second may at pleasure be put into either of the two positions represented in the engraving, so as to contain, with the former ruler, in either position, an angle of sixty degrees. The groove should be of such a size, that when its shoulders *a* and *d* are in contact with, and rest against the edges of the first ruler, the edge of the second ruler should coincide with *d e,* the side of an equilateral triangle described on *d g,* a portion of the edge of the first ruler; and when the shoulders *b* and *c* rest against the edges of the first ruler, the edge of the second should lie along *g e,* the other side of the equilateral triangle. The second ruler should have a little foot at *k* for the same purpose as the prominences on the first ruler, and both of them should have their edges divided into inches, and tenths, or eighths of inches.

It would be convenient if the second ruler had also another groove *r s,* so formed, that when the shoulders *r* and *s* are in contact with the edges of the first ruler, the second should be at right angles to it. For representing circles in their proper positions, the writer made use of the inner edges of rims cut out from cards, into isometrical ellipses as represented in the figure; of these he had a series of different sizes, corresponding to his wheels. Such a series might be cut by help of the concentric ellipses, but he thinks that it would be an easier way to make use of that set of concentric ellipses as they stand, by putting them in the proper place under the picture, if the paper on which the drawing is made be thin enough for the lines to be traced through, as by the help of them the several concentric circles will go to the representation of one which might be drawn at once. It is difficult to execute them separately with sufficient accuracy to make them correspond. For this purpose a separate plate of ellipses should be had, and one edge of the paper on the drawing-table should be loose to admit of the concentric ellipses being slid under it to the proper place.

By the use of the simple apparatus described above, the representation of these lines in the objects may be drawn on the picture, and measured to a scale, with the utmost facility, the point at the extremity being first found, or assumed. The position of any point in the picture may be easily found, by measuring its three distances, namely, first its perpendicular distance from the *regulating horizontal plane* (that is, the horizontal plane passing through the regulating point), secondly, the perpendicular distance of that point where the perpendicular meets the horizontal plane, from the regulating dexter line; and thirdly, of the point, where that perpendicular meets the dexter line from the regulating point; and then taking those distances reduced to the scale, first, along the dexter line, secondly, along the sinister line, and thirdly, along the vertical line, in the picture. These three may be called the *dexter distance* of the point, its *sinister distance*, and its *altitude*. And it is manifest they need not be taken in this order, but in any other that may be more convenient to the artist, there being six ways in which this operation may be varied.

If any point in the same isometrical plane, with the point required to be found, is already represented in the picture, that point may be assumed as a new regulating point, and the point required found by taking two distances; and if the new assumed regulating point is in the same isometrical line with the point, it is found by taking only one distance. And this last simple operation will be found in practice all that is necessary for the determination of most of the points required. Thus any parallelopiped, or any frame work, or other object with rafters, or lines lying in the isometrical directions, may be most easily and accurately exhibited on any scale required. But if it be necessary to represent lines in other directions, they will not be on the same scale, but may be exhibited, if straight lines, by finding the extremities as above, and drawing the line from one to the other; or sometimes more readily in practice by help of an ellipse, as hereafter described.

If a curved line be required, several points may be found sufficient to guide the artist to that degree of exactness which is required.

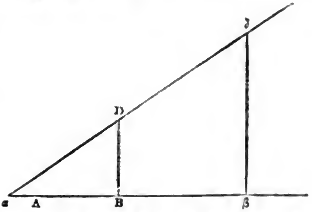
The method of exhibiting the representations of any machines, or objects, the lines of which lie, as they generally do, in the isometrical directions; that is, parallel to the three directions of the lines of the cube, is as has been already shown; and likewise the mode of representing any other straight lines, by finding their extremities; or curved lines, by finding a number of points.

But in representing machines and models, there are not only isometrical lines, but also many wheels working into each other, to be represented. These, for the most part, lie in the isometrical planes. And it is fortunate that the picture of a circle in any one of these planes is always an ellipse of the same form, whether the plane be horizontal, dexter, or sinister; yet they are easily distinguished from each other by the position in which they are placed on their axle, which is an isometrical line, always coinciding with the minor axis of the ellipse.

This will be obvious from considering the picture of a cube with a circle inscribed in each of its planes, fig. 28, and considering these circles as wheels on an axle. The two other lines, or spokes of the wheel, in the ellipse, which are drawn respectively through the opposite points of contact of the circle with the circumscribing figure, are isometrical lines also; for the points of contact bisect the sides of the circumscribing parallelogram, and therefore the lines are parallel to the other sides. They give likewise the true diameter of the wheels, reduced to the scale required. It further appears from the nature of orthographic projection, that the major axis of the ellipse is to the minor axis, as the longer to the shorter diagonal of the circumscribing parallelogram, that is, since the shorter diagonal divides it into two equilateral triangles, as the square root of three to one; and since the sum of the squares of the conjugate diameters in an ellipse is always the same, if we put $\sqrt{1}$ for the minor axis, the $\sqrt{3}$ for the major, and i for the isometrical diameter, we shall have $2 i^2 = 1 + 3, = 4$, and, $i = \sqrt{2}$.

Therefore the minor axis, the isometrical diameter, and the major axis, may be represented respectively by $\sqrt{1}$, $\sqrt{2}$, $\sqrt{3}$, or nearly by 1, 1·4142, 1·7321; or more simply, though not so nearly, by 28, 40, 49.

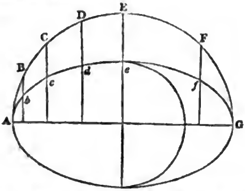
These lines may be geometrically exhibited by the following construction:



Let A B be equal to B D, and the angle at B, a right angle. In B A produced, take B α = to A D draw α D, and produce both it, and α B. Then will B D, B α, and α D, be respectively to one another, as $\sqrt{1}$, $\sqrt{2}$, $\sqrt{3}$. Therefore if $\alpha\,\beta$ be taken equal to the isometrical diameter of the ellipse required, $\beta\,\delta$ drawn perpendicular to it will be the minor axis, and $\alpha\,\delta$ the major axis. The ellipse itself, therefore, may be drawn by an elliptic compass, as that instrument may be properly set, if the major and minor axes are known. If it is to represent a wheel on an axle, care must be taken to make the minor axis lie along that axle. In the absence of the instrument it may be drawn from the concentric ellipses, which may be placed under the paper, in the position above described, and seen through it; if the paper be not too thick, and in this method the smaller concentric circles of the wheel may be described at the same time, as they may be seen through the paper, or if they should not be exactly of the right size, it would be easy to describe them by hand between the two nearest concentric ellipses; and thus also the height of the cogs of a wheel in the different parts of it may be exhibited longer and narrower towards the extremities of the minor axis. Their width may be determined from the divisions of the ellipse. In most cases this may be done with sufficient accuracy from the circumference of the ellipse being divided into eight equal divisions of the circle, by the two axes, and two isometrical diameters, each of which parts may be subdivided by the skill of the artist; and not only the face of the wheel in front may be thus exhibited, but the parts of the back circles also, which are in sight, may be exhibited by pushing back the system of concentric ellipses on the minor axis or axle through a distance representing the breadth of the wheel, and then tracing both the exterior and the interior circles of the wheel, and of the bush on which it is fixed, as far as they are visible. Care should be taken to represent the top of the teeth, or cogs, by isometrical lines, parallel to the axle, in a face-wheel, or tending to a proper point in the axle, in a bevil-wheel. And nearly in the same way may the floats of a water-wheel be correctly represented. If a series of concentric ellipses be not at hand, it will still be easy for an artist to draw the ellipses with sufficient accuracy for most purposes, by drawing through the proper point in the axle, the major and minor axis, and the two isometrical diameters, thus making eight points in the circumference to guide him.

If in any case it should become necessary to represent a circle, which does not lie in an isometrical plane, we may observe that the major axis will be the same in whatever plane it lies: and it will be the picture of that diameter, which is the intersection of the circle with the plane parallel to the picture, passing through its centre. And the major axis will bear to the minor axis the proportion of radius to the sine of the inclination of the line of sight to the plane of the circle. We may observe further, that the diameters of the ellipse, which are to the major axis, as $\sqrt{2}$ to $\sqrt{3}$, when such exist, are isometrical lines.

And the representation of every other line parallel, and equal to any diameter of the circle, may be exhibited by drawing it equal and parallel to the corresponding diameter in the ellipse. If it should be desired to divide the circumference of an ellipse into degrees, or any number of parts representing given divisions of the circle, it may be done by the following method:



Let an ellipse be drawn, and on its major axis, A G, a circle described, with its circumference divided into degrees or parts in any desired proportion at B, C, D, E, F, &c., from which points draw perpendiculars to the major axis. They will cut the periphery of the ellipse in corresponding points. It would be difficult, however, in this way, to mark, with sufficient accuracy, the degrees which lie near the extremities of the major axis. But the defect may be supplied by transferring those degrees in a similar way from a graduated circle, described on the minor axis. In this manner an isometrical ellipse may be formed into an isometrical circular instrument, or an isometrical compass, which may show bearings or measure angles on the picture in the same manner as a real compass or circular instrument would do in nature.

It may be often useful to have a scale to measure distances, not only in the isometrical directions, but in others also. And this may be done by a series of similar concentric ellipses, as in fig. 7, dividing the isometrical diameters into equal portions. The other diameters will be so divided as to serve for a scale for all lines parallel to them respectively.

Thus in the isometrical squares exhibited in fig. 1, distances measured on the longer diagonal, or its parallels, would be measured by the divisions on the major axis, those depending on the shorter diagonal by the divisions on the minor axis.

To describe a cylinder lying in an isometrical direction, the circles at its extremities should be represented by the proper isometrical ellipses, and two lines touching both should be drawn: and in a similar way, a cone, or frustum of a cone, may be described. A globe is represented by a circle, whose radius is the semi-major axis of the ellipse representing a great circle.

It would not be difficult to devise rules for the representation of many other forms which might occur in objects to be represented. But the above cases are sufficient to include almost every thing which occurs in the representation of models, of machines, of philosophical instruments, and, indeed, of almost any regular production of art.

PERSPIRATION. By perspiration from the bodies of beasts and men, we understand, 1, That operation by which certain fluid matters, separated from the blood in the thick network of capillary vessels and cells constituting the skin, are changed into vapour (or into fine effluvia,) and in this form escape at the pores of the skin; 2. Sometimes, also, the secretion and removal from the body of these matters themselves, by the action of the skin. This effluvium is usually so fine, that we cannot see it with the naked eye, whence we call it the "insensible perspiration;" but it becomes visible, if we hold the hand on cold glass or polished metal; also, if the perspiration is strong, in a cold temperature, or if, from a still stronger perspiration, this vapour is not dissolved in the air, but collects on the skin in drops forming sweat. This perspiration through the skin has much resemblance to the vapour that escapes from the lungs, to the secretions of the membranes lining the cavities of the body, as the stomach, chest, and abdomen, with which secretions it also appears to stand in connexion. The importance of this function will be evident when we reflect that the surface of a full grown man contains fifteen or sixteen square feet, and therefore the quantity of matter incessantly perspired must be very great, which is confirmed by the accurate observations of Sanctorius (Venice, 1611,) who spent a great part of his life at the balance. He weighed and kept an account not only of all the food that he consumed, but also of every thing that passed from him, and thereby proved that a great part not only of the fluid, but also of the solid substances that a man consumes, leaves his body by perspiration. Perspiration promotes two objects very important for the preservation of the bodily structure. One is the purification of the blood from injurious and superfluous matters. Besides the adventitious compound matters that pass into the blood from particular kinds of food (for instance, onions, &c.,) the carbon, the hydrogen, and particularly the excess of nitrogen, are carried off from the blood by perspiration, and changed by caloric into gas and vapour, and thus removed from the body. The substance of the body is, in many diseases, particularly in fevers, converted into aeriform fluids by an evaporation so extraordinarily increased and accelerated, that the strongest man is entirely worn away in a few days, without having lost any thing except through his skin. The other advantage of perspiration is the preservation of a suitable degree of warmth in the body, and the reduction of an immoderate heat. Every living body has its peculiar degree of warmth, which remains for the most part the same, whether the surrounding bodies are more or less warm. The temperature of man is about 92° to 99° Fahrenheit. As much caloric is employed in the process of perspiration (see *Evaporation*,) it is an important means of cooling the body, and of conducting off the heat which is incessantly generated within. The greater the heat which the body is exposed to, or the more it is produced within from other causes, as hot drinks and excitement, the greater is the perspiration, and the more actively is the heat conducted off. If the body is exposed to great cold, the operations of the skin are weakened, perspiration proceeds more slowly, caloric is more sparingly consumed, and thus accumulates in the body. Men usually lose flesh in summer, and recover it in winter, because the increased perspiration dissolves and removes more substance from the body in the former season. Therefore a man is cooled by sweat, and in the dry heat of a fever is refreshed as soon as a crisis produces perspiration. An interruption or even a disturbance of perspiration, for a long time, must then produce results in the highest degree prejudicial to the health, and even dangerous to life. These results, in a great measure, depend on the close connexion of the operations of the skin with those of the internal organs, and are the more stubborn and injurious the longer the perspiration is impeded. The increase of the internal warmth often produces a fever; also noxious matters are collected in the blood, from which it should be freed; therefore it changes from its natural condition, and an unnatural excitement is produced. Finally, the operation of the other organs of secretion is immoderately increased, because they have to perform in part the office of the skin: thence result, after a cold, rheum, sore throat, cough, also serious internal inflammations, diarrhœa, diabetes, dropsy, protracted rheumatism, and various other diseases. In a physiological view, William Cruickshank's Experiments on the Insensible Perspiration of the Human Body (London, 1795) deserves mention.

PERTH, an ancient and beautiful town of Scotland, the capital of the county of the same name, is situated on the right bank of the river Tay, about twenty-eight miles above its confluence with the sea; distant from Edinburgh forty-three miles, from Glasgow sixty-one, and from Dundee twenty-one.

Its origin has been assigned to a remote period, some antiquaries supposing that it was the site of a Roman town called Victoria, built by Agricola. The Picts, after their conversion to Christianity, erected a church here, and dedicated it to St John the Baptist, whom they chose as the tutelar saint of the place, which hence derived the appellation of St John's Town. About the year 1210, it was strongly fortified, and at that period it was regarded as the capital city of the kingdom of Scotland. Previously to the accession to the throne of the house of Stuart, and until the murder of James I. in 1436-7, Perth was the usual residence of the Scottish kings; and the parliament-house, in a close on the north side of the High-street, for some time used as an episcopal chapel, stood till a recent period. Freemason's Hall at present occupies its site. Fourteen parliaments were held here between 1201 and 1459. The walls of the city were rebuilt in 1298 by the English king, Edward I., whose deputies resided here till they were expelled by Robert Bruce. In the reign of Robert III., a singular combat occurred on the North Inch, between thirty picked men of the clan Chattan and the clan Kay respectively, in the presence of the king. One of the clan Chattan having absconded through fear, a saddler of Perth, by name Harry Wynde, supplied his place for half a French gold dollar, fighting, as he himself said, for "his ain hand." This circumstance has been made the foundation of one of Sir Walter Scott's novels, which is entitled, "The Fair Maid of Perth." In 1437, James I. of Scotland was assassinated at the convent of the Black Friars, near this place, by the earl of Athol, Robert Graham, and other conspirators. At Perth the Reformation of the church of Scotland may be said to have commenced; for on the eleventh of May, 1559, John Knox having preached a sermon in the parish church before many of the principal nobility, the people were so strongly excited, that taking umbrage at some indiscretion in the conduct of a Catholic priest who was present, they broke down the altars and images in the church, and then destroyed all the monasteries in the town. It was at Gowrie castle, on the south-east side of the town, that the Gowrie conspiracy, one of the most mysterious occurrences in Scottish history, took place.

In 1644, Perth was seized by the marquis of Montrose, after the battle of Tibbermuir; in 1715, this town was the head-quarters of the Pretender and the earl of Mar; and on the subsequent attempt to restore the house of Stuart in 1745, Perth was for some time occupied by the forces of Charles Edward, the young Pretender. William the Lion, king of Scotland, in 1210, granted a charter to the inhabitants of Perth, or St John's Town, in which he confirmed the privileges which had been bestowed by his grandfather, David I., and added several new ones; and this grant was ratified by succeeding sovereigns.

Among the religious foundations of Perth, which were destroyed at the Reformation, were a convent of Dominican or black friars, founded by Alexander II., in 1231; a convent of white friars or Carmelites, founded in the reign of Alexander III.; a monastery of Carthusian monks, founded in 1429 by James I. of Scotland, who, with his queen, was interred in the abbey church; and a convent of Franciscan or grey friars, founded in 1460 by lord Oliphant. In the records of the town it is stated that a company of players visited Perth in 1589, and obtained from the ecclesiastical consistory permission to exhibit dramatic performances, on condition that no swearing, banning (cursing), nor any scurrility should be spoken. Perth formerly gave the title of earl to the family of Drummond; but the title was forfeited by James, the fourth earl, for his adherence to James II., by whom he was created duke of Perth; his two sons were attainted in 1745.

An extensive commerce was long carried on between Perth and the seaports of the low countries. The town seems to have derived advantage from the civil war, under Charles I.; for after the expedition of Cromwell to Scotland, a great many of his soldiers settled here, and from them the native inhabitants acquired a spirit of industry and enterprise, and a taste for English arts and modes of living. There is a salmon-fishery on the Tay of considerable extent. The fish, either pickled or packed in ice, is sent to London; smacks sailing every three or four days during the season. The principal manufacture here was that of linen goods; but it has been in a great degree superseded by the cotton manufacture. The manufactures of leather, shoes, boots, and gloves, are prosecuted extensively. Printing at one time contributed considerably to the trade of the town, and from the Perth press proceeded an Encyclopedia, editions of the Scottish poets, and other works of reputation.

The environs of Perth present a most beautiful and interesting appearance. The entrance to the town from the Edinburgh road is on a gradual descent to the South Inch, and is beautifully picturesque. Pennant calls the view "the glory of Scotland." At the commencement of the Inch (a spacious green) there is a grand avenue of trees which extend to the town on the north side, on which there is another inch or green equally delightful. These fine expanded lawns are adorned by the river Tay, which flows along their green banks, the opposite shore being clothed in all the luxuriance that art and the hand of cultivation can produce. Adjoining the North Inch is a handsome bridge which crosses the Tay; and immediately across this bridge is situated the village of Bridge-end, leading to Kinnoul hill, whose summit, at the distance of a mile and a half, can be agreeably ascended by Montague walk, winding through a wood about one half of the distance. The precipice of Kinnoul is more than 600 feet perpendicular, and presents one of the most delightful prospects imaginable. The noble river which flows along the base of this stupendous height, the hills and more immediate objects in the foreground, and the grandeur of the mountainous perspective, afford a scene scarcely to be equalled. On the eastern bank of the river stands Scone palace, a magnificent pile of building, surrounded by extensive pleasure-grounds. This celebrated structure has been re-erected. The chapel, also re-erected, is at a short distance from the palace, and is surrounded with majestic trees, which give it an air of pleasing solemnity. To form a just idea of the beauties with which the vicinity of Perth abounds, they require to be visited. The town of Perth is large and well built; the two principal streets are long and spacious, and kept remarkably clean, well paved, and lighted with gas. The new town, which was begun in 1798, contains a beautiful circus and a terrace. The town-house, which forms the eastern termination of the High street, is a spacious structure, as is likewise the guild-hall. The parish church, which is famous as the place where John Knox first preached the Reformation, is a large and ancient edifice, at present separated into three divisions, named the east, middle, and west kirks. There is another parish church dedicated to St Paul, a chapel-of-ease, and various meeting-houses belonging to the dissenters. The chief public institutions in this town are a grammar-school, an academy, and a literary and antiquarian society established in 1784, with a valuable library of books and manuscripts. Population of the town, by the government census of 1821, 19,068; of 1831, 20,016.

PERTHSHIRE, an extensive county of Scotland, distinguished by the extreme beauty and variety of its scenery, is bounded on the west by Argyleshire, on the north by the shires of Aberdeen and Inverness, on the east by Forfarshire, on the south-east by the frith of Tay and the counties of Fife and Kinross, and on the south by the frith of Forth, and the counties of Clackmannan, Stirling, and Dumbarton. It measures from east to west about seventy-seven miles, and from north to south about sixty-eight, comprehending altogether 5000 square miles. It comprises the districts of Athol, Breadalbane, Monteith, Strathern, Stormont, Balquhidder, Gowrie, Rannoch, and Perth Proper; all of which, previous to the act for abolishing heritable jurisdictions passed in 1748, were stewartries belonging to some of the great proprietors; but these divisions are now regarded as of little importance, and the county is more naturally distinguished into highland and lowland, the former comprehending eighteen entire parishes, and the latter fifty-eight. The line of separation is formed by the Grampian hills, and though there are some considerable heights southward of these mountains, as the Ochils and Sidlaws, yet still they may be included in the lowland district, on account of the language and manners of the inhabitants, which are different from those of the Highlanders. Some of the loftiest of the Scottish mountains are in this county, among which may be specified Benlawers, Benmore, Shihallion, Benledi, Benglo, Benchonzie, Benvoirlich, and Torleum. Strathern is one of its great valleys, so called from the river Erne, which flows through it from east to west in a direct line, extending about forty miles. The Carse of Gowrie is another fertile vale on the northern border of the river Tay, consisting of a level tract of rich land cultivated like a garden, and particularly remarkable for the produce of fruit. In many parts of the county are extensive mosses, especially in the district of Monteith, in which is situated the moss of Kincardine. The rivers and lakes are numerous; among the former, the Tay and the Forth are the most important, and these receive many tributary streams in their course through this county. The most remarkable among the lakes are loch Tay, loch Rannoch, loch Erne, loch Dochart, loch Catherine, and loch Ericht. As these lakes, though hemmed in by vast mountain boundaries, do not present, generally, a desolate aspect, but are varied with woods and verdure, they exhibit, in many parts, scenes of almost magical grandeur and beauty.

In the lowlands of Perth, agriculture is carried to great perfection; and the rents in the Carse of Gowrie are higher than in any other merely rural district. The highland tracts, on the contrary, are in general fit only for pasturage; and, of late years, a vast number of cattle are regularly exported from this county, in steam-boats, to the London market. In Breadalbane and Monteith there are extensive forests, and within the last fifty years there has been a vast deal of planting in Perthshire; the late duke of Athol, alone, having planted on his estates to the amount of 24,756,000 trees, chiefly larch. The red-deer, or stag, the roe, and a variety of other game, inhabit the forests and other mountain glades of the county. From its numerous lakes and rivers, this county is abundantly supplied with fish. Trout, perch, pike, and eels, are plentiful, and the char is found in some of the lesser alpine lakes about Glengoe. Of the value of the salmon-fisheries, some idea may be formed, when it is stated, that the annual rent of the first eighteen miles of the river Erne is about £10,000, and that of the Tay is perhaps much more, independently of its more remote streams. Linens and cottons of various kinds, together with shoes, of which the seat is at Perth, constitute the principal manufactures of the county. Among the mineral products are coal, found in the southern parts, near Culross and Kincardine; limestone, of which there are many quarries in the highland division, and that which is dug at Monteith approaches the nature of marble, and admits of being finely polished; slate, procured, especially in the parish of Aberfoyle; granite, in the northern mountains; freestone, which is abundant, and of excellent quality; steatites or soap-rock, found in Monteith; and clay of a valuable kind for pottery, extensive strata of which have been discovered near Culross. The most remarkable mineral waters in the county are those of Pitcaithly. The royal burghs in this county are Perth, the county-town, and Culross; and there are several towns which were formerly privileged as royal burghs, as Auchterarder, Abernethy, and Dunblane. Among the burghs of barony are Dunkeld, Crieff, Longforgan, Cupar of Angus, and Alyth; and besides these there are sixty other considerable towns and villages, including Doune, Callander, Muthil, Blairgowrie, and Inchture. Among the more considerable of the numerous seats of the nobility and gentry in this county are Blair castle in Athol, and Dunkeld house, belonging to the duke of Athol; Taymouth, the seat of the marquis of Breadalbane; Duplin castle, belonging to the earl of Kinnoul; Drummond castle, Ochtertyre, Duneira, Blair Drummond, Methven castle, Castle-Huntley, Castle-Gray, Kinfauns, and Valleyfield. In the shire is a large association of landed gentlemen for the protection of game, woods, and plantations. The county gentlemen also form a hunt, having races at Perth, in addition to which, there is the Strathern coursing club, and the Doune club. Beside these, there are a number of agricultural societies in the county. Population of the shire in 1821, 139,050; in 1831, 142,894.

PERTURBATIONS of the course of planets are their deviations from their regular elliptic course, produced by their mutual gravitation. The Newtonian discovery of the law of universal gravity threw much light on this important subject. Newton has shown that all bodies are attracted towards each other: hence every planet gravitates not only towards the sun, but also towards the other planets, the moon not only towards the earth, but particularly towards the sun; nay, even towards Venus and Jupiter. The regular course of the planets in elliptic orbits, according to Kepler's laws, is effected by the attraction of the sun, the course of the moon by the attraction of the earth; deviations must, therefore, naturally occur in the motion of the moon and planets, if they are acted on also by other bodies. Newton explained and determined part of these deviations; for instance, the precession of the equinoxes, and the nutation of the earth's axis. (*See these articles.*) But many problems which require the infinitesimal calculus for their solution, he left undetermined. Clairaut, D'Alembert, and Euler, subsequently occupied themselves with this subject; but even their solutions are only approximations. Laplace finally found a formula universally applicable, which gives the most exact results, and published the same in his *Mécanique Céleste*. This great work is so much condensed, that it requires a perfect knowledge of analysis, and is, therefore, unintelligible to many mathematical readers. Doctor Bowditch's translation and commentary, unfolding the processes by which the results are obtained, render the study of this work comparatively easy. Bohnenberger, in his Astronomy (Tubingen, 1811,) treats this subject in a less difficult manner than Laplace.

PERU; a republic of South America, formerly a Spanish viceroyalty, lying between 3° 20′, and 21° 30′ S. lat., and between 67° and 86° W. lon.; bounded N. by Colombia (Quito) and Brazil, to the E. by Brazil and Bolivia, or Upper Peru; to the S. by Buenos Ayres, and W. by the Pacific ocean; square miles, 426,000; population, 1,700,000. In respect of physical geography, Peru may be divided into the low country on the coast (with a hot climate, characterized by the total absence of rain, the want of which is imperfectly supplied by dew and mists from the ocean,) and the highlands, which are formed by elevated ridges (*sierras*), beginning about sixty-five miles from the coast, and rising gradually to the Andes, of which, in fact, they are the lower steps. This latter region contains lofty plains, from 8000 to 10,000 feet above the level of the sea, and numerous deep valleys. (See *Andes*, and *South America*.) The low districts on the coasts, which are supplied with water, or which lie on the streams and rivers, are fruitful. Besides the streams which flow down the western declivities of the Andes into the Pacific ocean, the Marannon or Amazon, and the Ucayale, a tributary of the Amazon, are the principal rivers. The great plain, called the *Pampas del Sacramento* (see *Pampas*), on the Ucayale, is remarkable for its fertility. Earthquakes and sand-spouts sometimes commit terrible ravages. In the high lands the climate is severe, but healthy. Among the animal and vegetable productions of Peru are lamas, vicunnas, guanacos, pearl-muscles, purple-fish, cochineal, silk-worms, corn, wine, tobacco, sugar, coffee, cocoa, vanilla, cotton, Peruvian bark, Peruvian balsam, indigo, ginger, cinnamon, &c. Peru is particularly rich in gold and silver. Humboldt reckoned the value of the quantity of these metals, obtained yearly, at more than 6,000,000 dollars. (See *Mines* and *South America*.) Platina, copper, tin, lead, quicksilver, precious stones, salt, alum, saltpetre, coal, sulphur, &c., are also found. The capital of Peru is Lima. The republic is divided into seven intendencies,—Arequipa, Cusco, Guamanga, Guanca Velica, Lima, Tarma, and Truxillo, —which are subdivided into provinces. An extensive tract of country in the north-eastern part, and not included in these divisions, is inhabited by independent Indians. The population is composed of European Spaniards, creoles, metis, or mestizoes, Indians, negroes, and mulattoes. The creoles are, since the revolution, the most influential class. The Indians and mestizoes form the most numerous body. By the constitution of 1828, slavery is totally abolished, and a slave brought into the country becomes free. The wealth of Peru has been entirely owing to its mines, the richness of which, with the sterility of the soil, has prevented much attention being paid to agriculture. The whale fishery on the coasts, and the commerce of the country, are almost entirely in the hands of the Anglo-Americans of the United States, and of the British. Its long extent of coast, with numerous bays, harbours, and road-steads, affords great facilities for commerce. The exports of Peru are copper, cocoa, Peruvian bark, wool (of sheep and the vicunna), and chinchilla furs; imports, silk goods, linen, woollen goods, wine, cottons, &c. Mining operations are impeded by the deficiency of quicksilver and wood; there are four copper, four quicksilver, twelve lead, and 680 silver mines, and seventy gold mines and washings. The richest silver mines are those of Pasco and Lauricocha; they lie 13,000 feet above the level of the sea, and yield 2,000,000 dollars annually. The mines of Chota, or Gualgayoc, in Truxillo, are richer than those of Potosi; they are 13,385 feet above the level of the sea, and yield about 44,000 lbs. of silver annually. Those of Huantajaya, in Arica, in a dry desert, yield yearly 52,000 lbs. Two masses of native silver have been found here, weighing, one 225, the other 890 lbs. Gold is obtained in Tarma from the mines of Pataz and Huilies, and in the washings on the banks of the Upper Marannon.

According to the traditions of the Peruvians, the early civilization of their country was the work of Manco Capac, who reclaimed their ancestors from barbarism, and introduced art, law, and religion, among them. According to Garcilaso de la Vega, this event occurred towards the beginning of the twelfth century. The successors of Manco Capac continued to reign until the arrival of the Spaniards in the country. Atahualpa, the fifteenth inca, was defeated and put to death by Pizarro, who, with Almagro, had entered Peru at the head of a small Spanish force, in 1532, and rapidly reduced it to submission. Of the ancient Peruvians, we have yet some remarkable monuments remaining, such as their roads (called by the Spaniards *Camini del Inca*), which traversed the empire in every direction, fortresses, temples, and palaces, which prove their mechanical skill. They were acquainted with the arts of mining, of working in gold and silver, of polishing precious stones, and of sculpture. Their agricultural labours, and their manufactures of wool, &c., prove their intelligence and industry. (See Garcilaso de la Vega's *Historia de las Antiguedades y Conquista del Peru*.) Pizarro, having put the inca to death, took possession of Cuscu and its immense treasures. The cruelties which were practised by the Spaniards, finally came to the ears of Charles V., who caused a code of laws to be drawn up for the government of the American conquests, and established an *audiencia* at Lima, the president of which was appointed governor of Peru in 1543.

Still the natives were subject to enormities of the most atrocious character, as long as the first murdering and robbing conquerors survived; and, for a long series of generations afterwards, to the most arbitrary and oppressive acts of a cruel government. The timid and unwarlike Peruvians were repeatedly driven to rebel against their hard masters; one of the most celebrated of these revolts was that headed by Tupac Amaru, in 1780. (See *Tupac Amaru.*) In 1718, the province of Quito, which had previously formed a part of the viceroyalty of Peru, was annexed to New Grenada; and, in 1778, the provinces of Upper Peru (see *Bolivia*) were attached to the government of Buenos Ayres. On the invasion of the Spanish peninsula by the French, in 1808, the first symptoms of revolt began to show themselves in Peru, as in the other Spanish-American colonies; but the Spaniards were powerful enough to repress this spirit until 1821, when general San Martin, at the head of a Chilean force (see *Chile*), obtained possession of Lima, and the independence of Peru was declared (July 15). August 3d, general San Martin was declared protector of the new republic, with the supreme power, civil and military. Callao capitulated September 19. The Spanish generals, La Serna and Canterac, retreated to the mountains, and kept possession of Cusco. In March, 1822, the protector assembled a Peruvian congress at Lima, composed principally of his partisans, which drew up the plan of a constitution: it provided that the Catholic religion should be the religion of the state; that the legislative authority should be vested in the representatives of the people; that the freedom of the press, and the liberty of person and property, should be secured; the abolition of the slave-trade, of the tribute exacted from the Indians, and of the compulsory labour to which they had been subject, was provided for; a senate was to nominate to the executive authorities the civil and ecclesiastical officers, and, in extraordinary cases, convoke a congress. Much dissatisfaction was produced by this plan, as being too monarchical in its principles. In 1823, San Martin retired, and Lamar was placed at the head of the government, the marquis of Torretagle being governor of the capital. Meanwhile La Serna had maintained himself, and collected new forces in Upper Peru, and defeated the republican troops at Moquegna, January 20, 1823. But the divisions of the Spanish commanders, La Serna, Valdez, Canterac, and Olaneta, saved Peru. Riva-Aguero, who had assumed the presidency, called on the Colombians for assistance. General Sucre was despatched to the aid of the Peruvians; he compelled Canterac to evacuate Lima, which had fallen into his hands, and advanced to Upper Peru, while Bolivar entered Lima, and received the title of *libertador*, with supreme military power. Bolivar obliged Riva-Aguero (who had still continued to exercise his authority in Truxillo) to surrender and leave the country, and, in November, the Peruvian congress adopted a constitution on the model of that of the United States of North America, which was not to have effect until the expiration of Bolivar's dictatorship. La Serna had, meanwhile, collected a large army in Upper Peru, but was prevented from attempting any thing against the patriots, by the opposition of Olaneta, who was at the head of the absolutists, while La Serna had declared himself a constitutionalist. Torretagle, who had been declared president of the republic, was at the head of a party, which was working in secret against the influence of the liberator. Whilst things were in this state, the garrison of Callao (February 5, 1824,) hoisted Spanish colours, and opened the fortress to the Spanish ships of war which were blockading the harbour. In this emergency, congress conferred unlimited civil and military power on the dictator, who evacuated Lima on the 27th. Canterac entered the capital on the 29th, and Torretagle now joined the royalists. The war between the royalists was again renewed, and was again the means of saving Peru. Bolivar, having artfully drawn Canterac into the plains of Junin, gained some advantages over him on the 6th of August, and compelled the royalists to evacuate Lima; general Rodil, however, threw himself into Callao. After the patriots had suffered several disasters, Sucre fell back into an advantageous position at Ayacucho, and determined to await the enemy. December 9, 1824, the patriots, 5780 strong, were attacked by a royalist force of 9310, and gained a complete victory. La Serna and Valdez were made prisoners, and Canterac signed a capitulation on the field, by which it was stipulated that the royalist forces should lay down their arms, and evacuate the whole of the country to the Desaguadero. The battle of Ayacucho was decisive of the fate of South America. General Rodil refused to surrender Callao, and that fortress held out till January 22, 1826, when it was reduced by famine. Olaneta still maintained himself, for a time, in Upper Peru, but, in 1825, was totally routed by general Sucre. Of the events which followed in Peru, the suspicious conduct of Bolivar, and the constitution which he attempted to force upon the country, we have given an account in the articles ***Bolivar*** and ***Bolivia***. The general disaffection and suspicion which had been excited among the patriots of Peru, resulted in the revolution of January, 1827, which was effected by the co-operation of the Colombian troops left in Peru, who were unwilling to serve as the instruments of imposing a yoke on their Peruvian allies, and were fearful of the designs of Bolivar on the liberties of their own country. The Bolivian constitution was abolished, and the congress, which convened in May, declared the Peruvian constitution of 1823 to be in force, and chose general Lamar president of the republic. April 19, 1828, a new constitution was adopted, to be in force until 1833, when a general convention was to be summoned to revise and amend it. In June, the Bolivians (who were equally disgusted with the code which had been imposed on them by Bolivar) requested aid from the Peruvians, to enable them to throw off the yoke; and colonel Gamarra was despatched, at the head of a Peruvian army, to their assistance. He deposed Sucre, who had been chosen president for life. (See *Bolivia.*) These measures were followed by a declaration of war against Peru by Bolivar. Lamar accordingly entered the Colombian territory at the head of a large force, but was defeated, February 29, 1829, by general Sucre at Tarqui. The imbecility which Lamar manifested on this occasion, gave rise to a conspiracy against him, and he was deposed by general La Fuente, June 29. August 31, the congress met, and chose general Gamarra president. The hostilities with Colombia were terminated by the treaty of September 22, 1829.—See Hall's *Journal written on the Coasts of Chile, Peru, and Mexico;* Stevenson's *Twenty Years' Residence in South America* (London, 1835, 3 vols.); *American Annual Register* (vols. 1, 2, and 3).

PERUGIA; a delegation or province of Italy, in the States of the Church, including the ci-devant *Perugino*, watered by the Tiber and the lake of Perugia; population, 163,000.

PERUGIA (anciently *Perusia*, and *Perusium*); a city of Italy, capital of a delegation in the States of the Church, twenty-seven miles north-north-west of Spoleto, sixty south-east of Florence, seventy-two north of Rome; lon. 12° 17′ E.; lat. 43° 6′ N.; population, 30,000; a bishop's see. It stands on the summit of a hill, near the Tiber, having one of the most delightful situations in all Italy. It is tolerably well built, and contains forty-five churches and forty-eight convents, which are by no means elegant, several hospitals, and a university on a small scale. It has manufactures of velvet and silk stuffs, and considerable traffic in corn, cattle, wool, silk, oil and brandy. The surrounding country is very rich. The citadel was built by pope Paul III. Perugia was, in the times of the Romans, one of the twelve principal Etruscan cities. It suffered much by the irruptions of the barbarians, and again by the contests between the Guelfs and Gibelines. See *Guelfs*.

PERUGIA, Lake; the ancient *Thrasymene*. (q. v.)

PERUGINO. Pietro Vanucci, surnamed *Il Perugino*, the founder of the Roman school of painting, born at Citta della Pieve, in 1446, received the rights of citizenship in Perugia (whence his surname), and, at an early age, distinguished himself by his works. Bonfigli and Pietro della Francesca were probably his masters. His pictures have much grace, and are particularly successful in female and youthful figures. The turns of his heads are noble, and his colouring is lovely. A certain hardness and dryness in the forms, and poverty in the drapery, were the faults of his age, from which he did not wholly escape. Tranquillity and childish simplicity characterize his works, which are defective in invention. His frescoes are softer and in better keeping than his other productions, as the fine specimens in Perugia, Rome, Bologna and Florence prove. Raphael is his most celebrated disciple.

PERUKE. See *Wig*.

PERUVIAN BARK. See *Bark*.

PERVIGILIA; those feasts of the ancients which were celebrated during the night in honour of certain deities, particularly Ceres, Venus, and Apollo. The same name was given to nocturnal banquets in general.

PESTALOZZI, John Henry, one of the most distinguished men of modern times for his efforts in the cause of education, was born, January 12, 1746, at Zurich, in Switzerland, and was educated by pious relations, after the death of his father, who had been a physician. Even when very young, he manifested strong religious feelings, a quick sense of right, compassion towards the poor, and a fondness for young children. He had a great inclination for the study of languages and theology; but, after an unsuccessful attempt to preach, he studied law. Some treatises of his on preparation for a profession, and on Spartan legislation, and the translation of some speeches of Demosthenes, which he published, were proofs of his diligence and talents. But Rousseau's *Emile* filled him with a dislike for the habits of a learned life, and for the general system of education in Europe; and a dangerous illness, occasioned by excessive study, induced him, immediately after his recovery, to burn the greater part of the extracts and collections which he had made during his study of the history of his country and of law, and to become a farmer. He studied agriculture with a farmer near Berne, and then bought a piece of land in the neighbourhood, built a house, which he called *Neuhof*, and began the life of a farmer when he was twenty-two years old. He soon married, and became concerned, through his wife's relations, in a calico manufactory. In these situations, he became acquainted with the moral wretchedness of the lowest classes, and, in 1775, began his career of instruction by the admission of the children of paupers into his house. He soon saw himself surrounded by more than fifty children, to whom he was a teacher and father. He had no aid from others, and, though he worked with the children when he was not employed in teaching them, or in his private affairs, he had not the practical talent necessary to turn the labour of his little workmen to account. His philanthropic and noble self-denial was derided; his confidence was abused; his own affairs declined; and he was generally considered as a well-meaning enthusiast. But he had formed his purpose, and was not to be diverted from it; and, amidst straitened circumstances, he collected that knowledge of the state of the lower classes which is set forth so admirably in his novel *Lienhardt und Gertrud* (1781, 4, vols.),—a work which has exerted a remarkable influence. The description in this work of the school at Bannal contains many characteristic traits of Pestalozzi's life, at that time, at Neuhof. To illustrate this novel, he wrote, in 1782, *Christoph und Else*, besides *Abendstunden eines Einsiedlers*, in Iselin's *Ephemeriden*, in which he gives the first account of his method; a *Schweizerblatt fur das Volk* (1782 and 1783); a Treatise on Legislation and Infanticide, and Inquiries into the Course of Nature in the Development of Man (1797),—which are full of thought (all in German). The latter work was written at a time when Pestalozzi had suffered many vexations and misfortunes. The want of all support at last obliged him to give up an undertaking which was too great for the means of an individual. In 1798, the directory of Switzerland invited him to establish a house of education at Stanz for poor children. He became here the teacher, father, and, we must add, servant to eighty children, of the lowest classes. But war, and the efforts of a party unfriendly to his scheme, destroyed this establishment after a year. Pestalozzi now took charge of a school at Burgdorf, where he also received pupils, who paid for their instruction, so that he was enabled to employ able assistants. A publication on the application of his method by mothers, which appeared in 1801, under the title How Gertrude teaches her children (in German), and the elementary books, Book of Mothers (in German), and the *Anschauungslehre der Zahlenverhältnisse* (the Doctrine of Numerical Relations conveyed by Perceptions of Form*), found well-disposed readers. But Pestalozzi brought new vexations on himself by mingling in politics. He was a decided democrat and man of the people, who, in 1802, sent him as their delegate to the first consul; and, in 1802, he published his Views on Subjects to which the Legislature of Helvetia should chiefly direct its Attention, which made the higher classes unfriendly to him. His institution, in the mean while, flourished. In 1804, he removed, with his school, to Munchen-Buchsee, where he entered into a nearer connexion with Fellenberg, and, in the same year, to Yverdun, where he occupied the castle given to him by government.

Pestalozzi's method has become the subject of animated discussion since the beginning of the nineteenth century, partly owing to the opposition which new schemes always meet with, and partly to the extravagance of his admirers. Pestalozzi was a man of great genius and depth of feeling, full of the spirit of self-sacrifice, devoted to the noble purpose of aiding mankind in the most effectual way, by the instruction of the poor and abandoned, in which he was warmly engaged until his death. He loved liberty, and believed that its cause would be most promoted by the education of the most neglected. His genius, moreover, enabled him to devise the most effectual plans for obtaining this end. But he was not sufficiently practical properly to direct the economy of a large establishment for instruction, and to employ to the most advantage the talents of many teachers. He was void of worldly prudence, and this want was an abundant source of vexations to him and others throughout his life. The idea of communicating all instruction by immediate address to the sensations or conceptions, and effecting the formation of the child by constantly calling all his powers into exercise, instead of making him a mere passive recipient, selecting the subjects of study in such a way that each step shall best aid the further progress of the pupil, is original with him. It is not the acquisition of skill in reckoning, reading, writing, drawing, singing, &c., but the exercise of the powers of the child by means of these subjects, which Pestalozzi makes the object of elementary education. The principles of his method are clearly developed in his *Wochenschrift für Menschenbildung* (3d and 4th vols., 1810 and 1812). This publication, with the reply of his assailant, Niederer, to the Report on Pestalozzi's Institution at Yverdun (addressed to the diet in 1810), Gruner's Letters from Burgdorf (in German, in 1806), and Johannsen's Criticism of Pestalozzi's Method (in German, 1804, afford a satisfactory view of his system. He himself did not consider his system entirely complete. From Spain, France, Prussia, and many other countries, testimonies of honour and regard were sent to him from the governments; and his pupils have spread as far as European civilization extends. His exterior was extremely simple. His negligent black dress, his broad Swiss dialect, and blunt manners, without any kind of ceremony, showed the honest Swiss. In 1818, he undertook a new edition of his complete works, the proceeds of which he destined for a new school for poor children. He died February 17, 1827, at Brugg, in Aargau.—See his autobiography, *The Scenes of my Life while at the Head of my Institutions of Education at Burgdorf and Yferdun* (Leipsic, 1826); also Ed. Biber's *Memoirs on Pestalozzi and his Plan of Education* (London, 1831).

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* Not an exact translation, but as near as we can give it, without a long paraphrase.

PESTH, or PEST (anciently, *Transacincum*); a city of Hungary, on the Danube, opposite to Buda, with which it is connected by a bridge of boats three quarters of a mile long; ninety miles south-east of Prestburg, 113 south-east of Vienna; lon. 19° 14′ E.; lat. 47° 32′ N.; population, 61,502, of which 45,000 are Catholics. Buda is the residence of the viceroy, and accounted the capital of Hungary, yet Pesth is the seat of the high courts of justice, and the place of meeting for the diet. It is situated on a plain; the streets are tolerably spacious and regular, and the houses substantial, but not elegant. It contains eleven Catholic, one Lutheran, one Reformed, and two Greek churches, two synagogues, four convents, three hospitals, a university, a gymnasium, a public library, and a royal museum. The university was transferred hither from Buda in 1784, and is the only one in Hungary. It has four faculties, and is richly endowed, having a library of 60,000 volumes, a botanic garden, an observatory, &c. The number of regular professors is forty-three, and the number of students is about 1000; and in the gymnasium, 701. The lectures in the university are generally given in Latin. Pesth is the most populous and most commercial town in Hungary. The Danube affords means of intercourse with a considerable tract of country. There are four annual fairs, which are numerously attended. The manufactures comprise silk, cotton, leather, jewellery, musical instruments, and tobacco.

PESTILENCE. See *Plague*, and *Cholera Morbus*.

PESTUM, or PESTO. See *Pæstum*.

PETAL; among botanists, an appellation given to the flower leaves, in opposition to the *folia*, or common leaves.

PETALITE; a mineral first discovered in the mine of Uto, in Sweden, and interesting as having led to the discovery of a new alkali. (See *Lithia*.) It is possessed of the following properties: massive; fracture splintery and imperfectly conchoidal; lustre resinous; colour white, occasionally tinged with red or blue; translucent; tough; hardness the same with that of feldspar; specific gravity, 2.439. It consists of silex 79.21, alumine 17.22, and lithia 5.76. If exposed to a high degree of heat before the blowpipe, it becomes glassy, semitransparent and white; but melts with difficulty, and only on the edges. When gently heated, it emits a blue phosphorescent light. This rare substance is found in Massachusetts, at Bolton, in a lime quarry, associated with pyroxene, sphene, and scapolite.

PETARD, in the art of war; a metallic engine, somewhat resembling a high-crowned hat, which is loaded with powder. Its use is, in a clandestine attack, to break down gates, bridges, barriers, &c., to which it is hung, by means of a wooden plank attached to it. It is also used in countermines, to break through the enemy's galleries, and give their mines vent.

PETECCHIÆ. See *Plague*.

PETER I., ALEXIEWITSCH, the Great, czar and emperor of Russia, born at Moscow, May 30 (June 11, new style), 1672, was the eldest child of the czar Alexis Michailowitsch, by his second wife, Natalia Kirilowna, daughter of a Russian boiar. Blessed with a healthy constitution and a vigorous mind, Peter attracted general attention while he was but a child; and Alexis wished to pass by his two elder sons, the sickly Feodor and the feeble Ivan, and appoint Peter his successor. But the ambitious Sophia, daughter of Alexis by his first marriage, prevented the elevation of her half-brother. Feodor III., however, the successor of Alexis (1676—1682), passed over Ivan, and named Peter, yet a minor, his successor. On the death of Feodor, Peter was accordingly proclaimed czar. But Sophia excited a rebellion of the Strelitzes, by the report that Ivan had been put to death by Peter, and that her own destruction was resolved upon. When Ivan afterwards appeared, the Strelitzes exclaimed, "Thou art our czar!" "I will be so," answered the trembling Ivan, "only on condition that my dear brother shall share my throne." Peter was, therefore, crowned with Ivan, June 23, 1682. The Strelitzes again rebelled; but Peter escaped with his mother to a monastery, which protected him from the fury of the insurgents. In the mean time, the cavalry of the czar hastened to his rescue, and overpowered the rebels, thirty of whom were beheaded to prevent future seditions. But Sophia, taking advantage of the weakness of Ivan and the youth of Peter, became constantly more assuming: her name was finally subscribed to the imperial ukases with those of the two czars, and her image was stamped on the reverse of the coins. Peter, meanwhile, was silently developing his manly and warlike spirit. He formed two companies of soldiers from the young men of his own age, in whose ranks he himself served. Their commander was the young Lefort. Sophia considered this amusement as well calculated to remove her brother from state affairs, and heard with pleasure of the excesses in which Peter and his favourites indulged. But the accomplished and enthusiastic Lefort was instilling a large amount of valuable knowledge into the mind of the inquisitive czar, in whom the early instructions of Sotow (an experienced diplomatist), and Francis Timmermann (a German mathematician), and the lessons of his mother, had already laid a solid foundation for the improvement of his mind and the formation of his character. Sophia herself soon perceived his superior talents, when, in the beginning of 1688, he appeared, for the first time, in the privy council. In 1689, Peter's marriage with Eudoxia Federowna Lapuchin, effected through the influence of his prudent mother, withdrew him from his former orgies, and gave him a new hold on the affections of the people. Sophia, having desired to be present, as regent, at a religious celebration, at which the czars themselves were commonly present, Peter opposed it in vain; and, a few faithful Strelitzes having betrayed to him her intention to assassinate him, with his wife, mother, and sister, he took refuge with them in the monastery of Troizkoi. Here he summoned to his aid general Gordon, a Scotchman, who, with all the foreign officers, immediately hastened to Peter. The czar soon found himself surrounded by numerous friends, and Sophia was obliged to take the veil. Peter then made a solemn entry into Moscow, and, in sight of all the people, embraced his brother Ivan, who left all the power in the more able hands of his brother. The first aim of Peter was the formation of a standing army, according to the European tactics. Lefort and Gordon trained the new troops, among whom were a great number of Huguenots, who had fled to Russia, after the repeal of the edict of Nantes. Peter soon saw himself surrounded by 20,000 well disciplined troops, and, at the same time, engaged in forming a naval force. His father, Alexis, desirous to trade with Persia by means of the Caspian sea, had procured a ship to be built by some Dutch shipwrights, which arrived at Astrachan, but was there burned by the Cossacks, and of the crew only two, one of whom was the gunner, Karsten Brand, returned to Moscow. Brand now became Peter's principal ship-builder, and, in 1693, the emperor sailed to Archangel in his own ship, the St Peter, to purchase clothes for his army. In 1794, he entered Archangel with several Russian vessels, and appointed prince Romanadowski admiral of the fleet. Regarding commerce as of the utmost importance for the civilization of his subjects, he cast his eyes upon the Black and Baltic seas, into which the great rivers of his empire emptied themselves. Being at war with the Porte, he first turned his attention to the outlet of the Don; at this point, he wished to conquer Azoph, to procure him an emporium on the Black sea. In July, 1695, he commenced the attack by land, but soon found it necessary to change the storming to a blockade. In the mean time, he hastened back to Moscow, embraced his dying brother Ivan, and furnished his subjects, who were suffering from the bad crops, with corn from Riga and Dantzic, in Russian ships. At the same time, he collected skilful engineers and artillerists from Austria, Brandenburg and Holland, and introduced greater uniformity into the army, of which the boiar Alexis Semenowitsch was the nominal commander, while Gordon, Lefort, and Golowin were in fact its soul. The new ship-yard, at Woronesch, on the Don furnished him, as early as 1696, with a fleet of twenty-three galleys, two galleasses, and four fire-ships, with which he defeated the Turkish fleet, in sight of Azoph. All relief by sea being now cut off, he pushed the siege with renewed vigour, and in two months (July 29) the Russians entered Azoph. To secure the possession of this key to the Black sea, Peter ordered fifty-five ships of war to be built, and a canal to be constructed connecting the Volga and the Don, and sent a number of the young nobles to Italy and Holland, to learn the art of ship-building, and to Germany to become acquainted with military discipline.

After having suppressed (February 2, 1697) a conspiracy of the Strelitzes and several noblemen against his life, in which he displayed much personal courage, he travelled in foreign countries. The affairs of the government, during his absence, were committed to prince Romanadowski and three boiars; and the Strelitzes were dispersed throughout the country, to secure the internal tranquillity of the empire. He set out on his celebrated journey in April, 1697, travelling, not in the character of czar, but as a member of an embassy, which was to visit foreign courts, according to the old Russian custom. Having passed through Esthonia, Livonia (countries then belonging to Sweden), Brandenburg, Hanover, and Westphalia, he arrived at Amsterdam, where he worked, *incognito*, in a Dutch ship-yard. From Amsterdam, he went to the village of Saardam, where he appeared in the dress of his own country, and caused himself to be enrolled among the workmen, under the name of *Peter Michaeloff*. Here he lived in a little hut for seven weeks, made his own bed, and prepared his own food, corresponded with his ministers at home, and laboured at the same time in ship-building. He then returned to Amsterdam, and superintended the building of a ship of war of sixty guns, which he sent to Archangel. Nothing passed him unobserved; he caused every thing to be explained to him, and even performed several surgical operations. The petition of the Jews of Holland to be received into his country he refused. He was induced, by his love for the sea, to accept the invitation of king William III. to visit London. Here Peter resided in the royal ship-yard, and often declared that, if he were not czar of Russia, he would be a British admiral. He took into his service upwards of 500 persons—officers, engineers, cannoneers, surgeons, &c. He received a doctorate from the university of Oxford, and, after a stay of three months, went through Holland and Dresden to Vienna. But an insurrection of the Strelitzes induced him to hasten home, and he arrived at Moscow, September 4, 1698. The insurrection had already been suppressed by Gordon; but Peter erected a bloody tribunal; every day of the succeeding month saw the blood of the rebels flow; and as there were the strongest reasons to suspect his sister Sophia of being the author of this disturbance, he caused twenty-eight gibbets to be erected, and 130 of the conspirators to be executed before her monastery; and three of them, who had drawn up a petition to Sophia, were hung before the windows of her cell, with the petitions in their hands. Five hundred were banished; the corps of the Strelitzes was abolished, and the last remains finally became extinct in Astrachan in 1705. It was probably merely from personal dislike that he accused his wife Eudoxia, who was impatient of his amours, of being engaged in the conspiracy. She was banished to Suzdal, where she was obliged to take the veil, under the name of *Helen*. To reward his faithful adherents, he established the order of St Andrew, Aug. 30, 1698, which Golowin was the first to receive. The death of his favourite Lefort and of Gordon plunged him into the deepest grief. Menzikoff, who rose from obscurity by his talents and activity, now became the favourite of Peter. He supplied the place of the Strelitzes by twenty-seven new regiments of infantry, and two of dragoons (in all 32,029 men), who, within three months, were disciplined and brought into marching order. Nothing but merit and length of services was regarded in the appointment of officers.

Peter devoted himself with incessant activity to the internal regulation of his empire, which assumed, by degrees, the appearance of a new creation. The manner of collecting the public taxes was simplified; the German costume was introduced; beards began to disappear; the numerous retinue of the boiars was diminished; foreign travel was in a manner necessary to secure the prince's favour; printing presses were set up, and useful works introduced; schools were established in all the large towns; and new ecclesiastical institutions organized. When the patriarch Adrian died, at Moscow, in 1700, the czar left this office, but little inferior in authority to the papal, unfilled. The armistice of two years between Russia and Turkey, stipulated in the peace of Carlovitza between the Porte and Austria, was prolonged (1700) to thirty years; but, at the same time, war was declared against Sweden. Patkul (q. v.) had now matured the alliance of the czar with Augustus, king of Poland, and no indications of good will on the part of the young Charles XII. of Sweden, could divert Peter from his designs. (See *Northern War*.) Peter occupied Ingria, and attacked Narva. The young king of Sweden (see *Charles XII.*) flew to its relief, and defeated 38,000 Russians with 8000 Swedes, November 30, 1700. This defeat did not shake the resolution of Peter. "I know," said he, "that the Swedes will often defeat us, but we are learning. Our turn to conquer will come at last." Fresh troops were immediately assembled, arms were provided, and the victory of the Russians over the Swedes on the Embach (January 1, 1702), laid the first foundation for their future triumphs. Noteburg (which received from Peter the name of *Schlusselburg*) and Marienburg were taken; among the inhabitants of the latter, who were carried into Russia, was the orphan Catharine. After a triumphal entry into Moscow, and a short delay at Woronez, Peter returned to the theatre of the war on the Baltic, where Menzikoff had been throwing up fortifications for the protection of the new docks, at the influx of the Olonza into lake Ladoga. For the same purpose, on the first of May, Peter took Nyenschantz, a fortress at the mouth of the Neva. Four days after, with thirty small vessels, on board of which he served as captain of bombardiers, he took two Swedish ships of war at the mouth of the same river. To reward him for his services on this occasion, admiral Golowin created him knight of St Andrew. As Nyenschantz was too far from the sea, and not sufficiently secure, Peter determined to construct a new fort, to protect the mouth of the Neva. He here built a small wooden hut, in the Dutch style, from which he superintended his new work. May 27, 1703, the foundation of the fortress was laid, which the czar called *St Petersburg*. The work was commenced under the direction of an Italian architect, and 20,000 men, from every part of the empire, were soon employed upon it. While engaged in this work, he determined to build a city, which should serve as a commercial emporium, to connect Russia with the rest of Europe. In four months, the fortress of St Petersburg was completed, and the city was also gradually rising. Many of the workmen, unwilling to undertake the long journey to their homes, settled here, where they were besides welcomed by the czar, as they were serviceable in erecting houses for the rich. Many Swedes, Finns and Livonians, driven from home by war, eagerly hastened to the new city, where they received the land in their own right; so that, in two years (1705), besides Vasili-Ostrov, where the first private houses were built, the island of St Petersburg and the admiralty quarter were settled. (See *Petersburg*.) Under the direction of Menzikoff, the fortress of Cronschlot arose from the sea, at a short distance, for the protection of Petersburg. More than 8000 horses, and as many men, perished in the labour of transporting the materials for building; but in March of the following year, the cannons thundered from the walls of Cronschlot.

In the mean time, Austria, Holland, and Britain made every exertion to destroy the alliance of Peter with Augustus of Poland. Charles left his great enemy in the heart of Livonia, and marched to Saxony to compel Peter's ally to abdicate his throne. Peter, on the other hand, commenced his new operations by the destruction of a Swedish flotilla of thirteen ships on lake Peipus. Dorpat, Narva, and Ivangorod were captured, and the Swedish army was finally destroyed under the walls of Pultawa (July 8, 1709). The czar, now promoted to the rank of lieutenant-general in the army, and rear-admiral in the fleet, wrote from the field of battle to Admiral Apraxin in Petersburg—"Our enemy has experienced the fate of Phaeton, and the foundation of our city on the Neva is, at length, firm." Peter immediately hastened back to his favourite city on the Neva, where he made preparations to connect lake Ladoga with the Wolga, and concluded commercial treaties with France, Italy, and the Hanseatic towns. Having celebrated his victory by a triumphal entry into Moscow, and re-organized the army, consisting of thirty-three regiments of infantry, twenty-four of cavalry, and 58,000 garrison troops, he commenced his campaign in Livonia and Carelia, which were conquered in 1710. The Turks, instigated by Charles XII., had, meanwhile, declared war against him. Peter immediately established a senate to administer the affairs of the empire, and, having restored to the bishoprics and monasteries the property before taken from them, in order to gain the favour of the clergy and the nation, he advanced to the Pruth, opposite the camp of Mehemed, the grand-vizier. The soldiers were here reduced to the greatest extremes from want of provision, and their condition was the more desperate on account of the defection of the prince of Walachia, and his refusal to furnish the promised supplies. Peter, nevertheless, crossed the river, but he was forced to retreat, and his exhausted army was surrounded by a numerous enemy. Peter saw nothing before him but captivity or death. He was delivered from this difficulty by his new wife, Catharine (whom he had privately married in 1707, and declared his lawful wife March 6, 1711.) Assisted by the field-marshal Scheremeteff, she sent to the grand-vizier, proposals of peace. A large sum of money, and valuable jewels, with promises of further remittances, all without the knowledge of Peter, are said to have accompanied the letter of Scheremeteff to the grand-vizier. During this time, Peter, despairing of any favourable results from this mission, and reduced to despondency, wrote to the senate in Moscow—"If I fall into the hands of the enemy, consider me no longer as your sovereign, and obey no commands which shall proceed from the place of my confinement, though it should be signed by my own hand. If I perish, choose the worthiest among you to succeed me." July 23, 1711, the peace of Huss was concluded, in spite of all the opposition of count Poniatowski, the agent of Charles XII. Peter purchased his own safety, and that of his army and empire, by the sacrifice of Azoph. (See *Russia* and the *Ottoman Empire*.) Cantemir, prince of Moldavia, whom Peter refused to give up on any condition, followed the czar, and continued to receive from him a pension until his death, twelve years afterwards.

He now applied himself with great activity to the prosecution of the war in Pomerania against Sweden. To restore his health, he went to Carlsbad, in the summer of 1711, and, on his return to Moscow, publicly solemnized his marriage with Catharine (Feb. 19, 1712). The translation of the senate of regency to

Petersburg took place two months later. In June, 1712, he again visited Carlsbad, with his wife. After having taken the waters three weeks, he proceeded to his army in Holstein, where Steenbock, the Swedish general, had obtained some successes over the Danes. He shut up this general in Tonningen, and returned to Petersburg, to effect the conquest of Swedish Finland, and, in 1713, penetrated beyond Abo to Tavasthus, while the Swedes in Tonningen were compelled to surrender. But the neutrality of Pomerania, proposed by Prussia, and consented to by Menzikoff, thwarted his plans: for this act, even the intercession of the czarina was hardly able to save the favourite from ruin. Peter continued his efforts to improve the Russian marine; but he was obliged to submit when the college of admiralty refused to promote him to the dignity of vice-admiral, "because he had not sufficiently distinguished himself at sea, to be preferred over other officers." His chief object was now to merit that distinction. Having obtained the naval victory at Twermunde, and completed the subjugation of Finland by the subsequent capture of the fortress of Nyslot, he was received, on his triumphal entry into Petersburg, by the vice-czar Romanadowski, with the salutation, "Hail, vice-admiral!"

Perceiving the oppressions exercised by the nobility upon the lower classes, he established a board to inquire into abuses. The investigation ended in the exile to Siberia of a great number of civil officers from the first to the third rank, and strict provisions against future abuses. He did not consider it prudent to attempt to abolish slavery for the present. He repaired the devastations which the war had caused in Ingria, by settling in that country a number of rich peasants from the interior of Russia. He exercised the greatest prudence in regard to the religious contests between the Roskolnicks (those of the ancient faith and the Orthodox, but was obliged to put to death a Roskolnick, who sought to obtain a martyr's crown by assassinating the czar. Events of this nature increased Peter's aversion to Moscow, and confirmed his determination to make Petersburg the capital of the empire. All his commercial ordinances, and his measures for the growth and embellishment of the city, were directed to this object. In the midst of these plans, he was informed that Charles XII. had returned, and was now in Stralsund. But as this headstrong prince refused to consent to the neutrality of Pomerania, and thus offended Britain as well as Holland, he prepared for the czar the way to new and easy conquests. Stralsund was taken December 23, 1715, by the Prussians and Danes, without the aid of Peter; and in the first impulse of anger, the czar was on the point of siding with Charles, because his troops were refused admittance into the works, and were even driven back by force. Before his visit to Pyrmont for the recovery of his health, he agreed with the king of Denmark upon a landing at Schonen; in pursuance of which he went to Copenhagen. Four fleets, Russian, Danish, British and Dutch, were united, forming a squadron of 80 sail, partly to cover the disembarkation at Schonen, and partly to make head against the Swedish fleet, which was cruising in the Baltic. The command of the combined fleet was unanimously committed to the czar; and he convoyed 100 merchant vessels, lying in the sound, by the fleet of Sweden. The landing at Schonen was abandoned by the advice of the Russian generals; this excited suspicions in the mind of the Danish king, and Peter left Denmark and took possession of Mecklenburg.

For the accomplishment of certain political plans, he undertook a journey to Holland and France, towards the end of 1716. In Amsterdam, besides the naval and commercial objects of his visit, he also attended to all the subjects of art and science. His wife, who visited him after her delivery in February, 1717, remained at the Hague, while Peter, in the beginning of April, went through Brabant to Paris, where he visited all the literary, military, mechanical and other institutions and collections of art, &c., and concluded a treaty of amity and commerce with France, in behalf of himself and Prussia. His main object, the separation of France from Britain, and his designs on Mecklenburg, were not accomplished. In October, 1717, he returned to Petersburg, and instituted investigations into charges of abuses and acts of oppression. Prince Wolkonski, the governor of Archangel, was shot, and military courts were commissioned to inquire into accusations against others. He then went to Moscow, to judge his only son, Alexis, who was condemned to death by the high officers of the empire. Though pardoned shortly after, he is said to have died of the agitation into which the trial and sentence had thrown him. At his funeral, which was solemnized with great pomp, the czar melted into tears. Many persons, involved in the guilt of Alexis, were executed with great cruelty. Peter treated with equal severity the nobles who oppressed the people, and did not even spare his favourites Menzikoff and Apraxin. He endeavoured to introduce a more regular administration of justice by the institution of the colleges of the governments, and a legislative committee, taking the code of his father, Alexis, for the basis of his new system. A commercial college was also erected, and the commercial class treated with distinction. His amusements consisted in ornamenting his capital, collecting a cabinet of natural curiosities, encouraging art, and raising the tone of society; he likewise provided amusements for the court and people, by public shows, masquerades, &c., (among which the papal election, intended to expose the head of the Roman church to ridicule, was particularly remarkable.)

Peter now landed troops on almost every point of the Swedish coast, and commenced a war of devastation, never to be forgotten in the annals of that country. Jealousy of the growing power of Russia united Poland, Prussia, and Denmark, with Sweden. But Peter resisted all, and maintained his dignity in a dispute with Austria. He banished the Jesuits from the empire, because they meddled with affairs in which they had no concern, and prepared for a conflict with Britain. In 1719, all the British merchants in Russia were arrested, and threatened with the seizure of their property. Peter was now called to endure the severest trials in the death of Scheremeteff, his companion in arms, and (on the 25th of April, old style) of the heir to the throne, Peter Petrowitsch, his son by Catharine, born Nov. 8, 1717. The czar remained alone for three days and three nights, after the death of his son, without food or drink; fears were at length entertained for his life. But he resumed his firmness, and one of his first measures was the institution of the "holy directing synod," designed to put an end to the hierarchy. (See *Greek Church*.) In 1720, Sweden was again devastated; the Swedish king having resolved on the invasion of Finland, with the aid of a British fleet. Peter, however, continued his negotiations, while he prepared for action, and directed the construction of the port of Royerwick. At length a third expedition against the Swedish coasts, successfully conducted by Peter in 1721, in spite of the British fleet, led to the peace of Nystadt (August 30, 1721, old style,) by which Livonia, Esthonia, Ingria, with Wiburg and Kexholm, were ceded to Russia. But the duke of Holstein, whom he had promised to aid in the recovery of Sleswick, was made the victim of political expediency.

Thus, after twenty-one years, the northern war was concluded without exhausting the resources of Peter, and the power of Russia was fixed upon an immovable basis. The czar celebrated the peace by thanksgivings and festivals, and a general pardon (murderers and irreclaimable highwaymen only excepted,) and by a remission of all the claims of the crown previous to 1717. The senate and the holy synod requested him, in the name of the nation, to accept the titles of "father of the country, and emperor of all the Russias, with the surname of the Great." He was proclaimed emperor on the grand celebration of the peace, October 22, 1721. This title was immediately acknowledged by Prussia, Holland, and Sweden, and, at a later period, by all the other powers. To prevent his great creation from falling to pieces in weak or incompetent hands, he decreed, (February 5, 1722,) that the sovereign of Russia should have full power to elect his successor, and to change this appointment, if he should see fit. By the new judicial organization, it was provided that no actual senator should sit in a court of justice, and no president of a court of justice in the senate.

The emperor now undertook his long meditated expedition to Persia, to secure the Russian trade on the Caspian sea. In 1715, 1716, and 1719, he had sent experienced naval officers to examine this sea and its coasts, and to hold vessels necessary for an expedition in readiness. In the first year of the war, he took Derbent, and built several fortified towns, which he peopled with Cossacks of the Don. The domestic confusions in Persia compelled the shah to yield, and by the treaty of September 12, 1723 (to which the Porte likewise assented, July 8, 1724,) to cede to Russia the cities of Derbent and Baku, with their territory, and the provinces Ghilan, Mazanderan, and Astarabad. After his return, December 26, 1722, he instituted new examinations for maladministration. The vice-chancellor Schaffiroff, one of his favourites, was condemned to death, but, on the scaffold, his punishment was commuted to banishment. Menzikoff was sentenced to pay 200,000 roubles into the exchequer; he was deprived of a large part of his income, and flogged by the emperor's own hand: for the infliction of this punishment, Peter used his *dubina* (a cane of thick Spanish reed.) Several others were disgraced or flogged, or heavily fined. July 12, 1724, Peter again conducted a fleet against Sweden, to enforce his claims on Sweden and Denmark, in behalf of the duke of Holstein: having effected this purpose, Peter returned to Cronstadt, where he celebrated, by a splendid parade, the creation of his navy, which now consisted of forty-one ships of war, with 2106 cannons, and 14,960 sailors.

This great monarch employed the last years of his life in providing against the inundations to which Petersburg was exposed in the autumn; in continuing the Ladoga canal, and in the erection of an academy of sciences (February 1, 1725.) He turned his attention next to the examination and punishment of state criminals; to the promotion of the labours of the legislative body; the establishment of the order of Alexander Newsky; the improvement of the condition of the monks; the banishment of the Capuchins from Russia; and a new commercial treaty with Sweden. He also betrothed his favourite daughter Anna to the duke of Holstein, November 24, 1724, having already placed the crown upon the head of his wife, Catharine, on the 18th of the preceding May, in token of his love and gratitude. He likewise provided that an education should be given to the surviving son of the unhappy Alexis, such as would become a future emperor of Russia. But Peter had long felt his strength declining, from the pains he had suffered through the strangury, ever since 1723: hence the gloom, alternating with violent bursts of passion, to which he became subject; and to this, perhaps, is to be ascribed the execution of Mons, first chamberlain, and favourite of the empress Catharine; the reason assigned for which was neglect of duty, bribery, &c. Late in the autumn of 1724, going to visit the forge and manufactory of arms at Systerbeck, he saw a boat filled with soldiers and sailors stranded, and sent a shallop, which did not succeed in getting it off; determined to gain his end, he set out for the spot himself, and, as his vessel could not quite reach the spot, he leaped into the water and waded to the boat, which he aided in getting off. But the cold which he caught rendered his condition extremely dangerous. He celebrated the new year, 1725, according to his usual custom, chose a new antipope, and ordered the demolition of the superfluous chapels, and the removal of the images. A surgical operation gave him no relief; his pain often deprived him of reason. In his intervals of sanity he was soothed with the consolations of religion by Theophanes, archbishop of Pleskow. In one of these intervals, he granted full pardon to Menzikoff, at the earnest desire of Catharine. He expressed a wish to speak with his favourite daughter, Anna; but when she came, the emperor was speechless. He expired, February 8, 1725, in the arms of his wife, who had not left him for three nights. Peter was fifty-three years of age, and, according to his physicians, might have lived forty more, if he had not so long concealed his disorder. Peter was a man of powerful and original genius, who did every thing himself, and was never the instrument of others. His ardour was joined with prudence, resolution, and a generous humanity. His violent passions and sensual excesses were the fruits of the barbarism of his nation, his imperfect education, and uncontrolled power. On the centennial celebration of his accession to the throne, an equestrian monument by Falconet, representing him at full speed springing up a rock, with his hand extended, and the inscription *Petro Primo, Catharina Secunda, MDCCLXXXII.*, was exposed to view in Petersburg. Voltaire wrote the life of Peter.

PETER II., emperor of Russia, grandson of Peter the Great, and son of Alexis, ascended the throne in consequence of the will of Catharine I., in 1727, when but thirteen years old. He died in 1730, of the small-pox, and was succeeded by Anna Ivanowna.

PETER III., (Fedrowitch); emperor of Russia. As the male line of the Romanoffs ceased with Peter II., the empress Elizabeth, daughter of Peter I. and Catharine I., agreeably to the order of succession enjoined by her father, appointed Charles Peter Ulrich, duke of Holstein-Gottorp, son of her sister Anna Petrowna and the duke of Holstein, her successor, in 1742; and, in 1745, she married him to the princess Sophia Augusta, of Anhalt-Zerbst (at a later period the famous Catharine II.). Peter III. ascended the throne in 1762. His first step was a reconciliation with Frederic II., to whom he restored the conquered kingdom of Prussia Proper, and sent 15,000 men to assist him. He established some salutary laws; but a conspiracy broke out, which put an end to his life, after a reign of six months. His predilection for the people of Holstein; his attempts to establish Prussian tactics, and to overthrow the privileges of the great, had made him numerous enemies. This conspiracy broke out in the night of July 8, in 1762. (See *Catharine II.*) He abdicated the throne July 10, but could not save his life by this means. He was, it is said, killed at Ropscha, a seat of count Rasumoffsky, July 14, (3 old style), 1762. See *Orloff.*

PETER, St, Church of. See *Rome*.

PETER THE APOSTLE (whose original name was *Simon*), was a Galilean fisherman from Bethsaida. His brother Andrew, having been received by Jesus among his disciples, introduced Simon to the divine instructer. He promptly resolved to leave all and follow Jesus, at whose command he had made a most remarkable draught of fishes. After this event, we find him always among the followers of Christ, and one of his most confidential disciples. From the firmness of his faith, Jesus named him *Cephas* (in Greek, *Petros*), a rock, and bestowed upon him peculiar marks of affection; yet he never gave him any superiority over the other apostles, as the Roman Catholics maintain, nor did Peter himself ever assume it. On the contrary, Jesus reminded him, in their presence, of his faults, and his impetuosity; and, in the last dreadful night before the crucifixion, Peter encountered the reproving look of his master, whom he had followed at a distance to the house of the high priest, and there basely denied, from fear of punishment. Repentance for this crime purified and strengthened his noble heart, which glowed with a warm love of Jesus. His zeal and eloquence made him often the speaker in behalf of his fellow apostles on important occasions; as, for instance, at the feast of pentecost, after the ascension of Christ, where Peter had the boldness to preach the gospel publicly, for the first time, and converted several thousands by his powerful eloquence; and before the Jewish council, where he defended the new faith. His opinions had great influence in the Christian churches; and, on his proposal, the apostles and elders of the first synod at Jerusalem resolved that a conformity to the laws of Moses should not be required of the Gentile converts to Christianity. Peter probably travelled through several countries of Middle and Western Asia, as a teacher of Christianity; but the tradition that he went to Rome, and was crucified there, in the year 67, rests only on the legends of the Roman church, on which, also, the pope rests his claims to be considered the successor of this apostle. The two Epistles of Peter, in the new Testament, were written in Greek, and directed to the churches in Asia Minor. In their style, and in the exposition of doctrines, they bear strong marks of his ardent mind, hurrying from thought to thought, careless in expression, but animated and forcible.

PETER The Hermit; an enthusiastic monk of Amiens, who, about the close of the eleventh century, roused Europe to the first crusade (q. v.). Peter, who had made a pilgrimage to Jerusalem, instigated by the difficulties he had undergone, flew, at his return, to pope Martin the Second, and, under the auspices of that pontiff, preached to an assembly of more than 4000 of the clergy, with 30,000 laymen, that met at Piacenza, the wild project of driving the Mohammedans from Jerusalem. The success of his enthusiastic harangues was proportionate to the boldness of his scheme and the ignorance of his auditors. Peter himself led the way through Hungary, at the head of an undisciplined multitude of more than 30,000 men, a comparatively small number of whom survived to reach the city. Peter distinguished himself by his personal courage at the storming of the holy city; and, having witnessed the accomplishment of his undertaking, returned to his native country, where he founded the abbey of Noirmoutier, and died its first superior.

PETERBOROUGH, Charles Mordaunt, earl of, son of lord Mordaunt, whom he succeeded in his title and estate, in 1675, was engaged in the expedition to Tangier, in 1680, in which he served with distinction against the Mohammedans. He went over to Holland in the reign of James II., and, entering into the scheme of his dethronement, returned to England with his successor, by whom he was created earl of Monmouth, and appointed first commissioner of the treasury. He succeeded to the earldom of Peterborough on the death of his uncle, in 1697, and was subsequently employed as commander of the English army in Spain, in the war of the Spanish succession. He distinguished himself greatly by his courage, activity, and conduct in taking Barcelona, and obtaining many advantages over the French, in consequence of which he was appointed generalissimo of the imperial forces, and received the thanks of the British parliament. In the reign of George I. he was made a knight of the garter, and received the appointment of general of marines. His death took place during a voyage to Lisbon, in 1735. Lord Peterborough was intimate with his literary contemporaries, and was himself a writer of poetry, some of which has been published. In the Correspondence of the Countess of Suffolk, edited by Mr Croker, are several of his letters.

PETERBOROUGH, Bishop of. See *Marsh*, *Herbert*

PETERERO, or PATTERERO; a small piece of ordnance used on board ships for the discharging of nails, broken iron, or partridge-shot, on an enemy attempting to board. They are generally open at the breech, and their chamber made to take out to be loaded that way, instead of at the muzzle.

PETERS, Hugh, minister of Salem, Massachusetts, was born at Fowey, in Cornwall, England, in 1599, and, in 1622, took his degree of master of arts at Trinity college, Cambridge. After obtaining a license, and preaching in London, with great success, he removed to Holland, and, several years afterwards, to America, on account of his non-conformity. In 1636, he was intrusted with the charge of the church at Salem, and remained there five years. He did not, however, confine his attention exclusively to spiritual concerns, but took an active interest in mercantile and civil affairs; he assisted in reforming the police of the town; suggested the plan of the fishery, and of the coasting and foreign voyages: procured carpenters, and engaged in trade with great success. In 1641, he went to England on a mission to procure an alteration in the laws of excise and trade, but never returned. During the civil war, he advocated the cause of parliament by his preaching, and was appointed by Cromwell one of the licensers of ministers, and also a commissioner for amending the laws, though totally disqualified for such employment. After the restoration, he was tried for conspiring with Cromwell, and compassing the king's death, and was executed October 16, 1660, aged sixty-one years. He is accused by Burnet of having pressed the condemnation of the unfortunate Charles, but he himself declared, in his will, that he opposed it. He was a man of no learning, but of impetuous zeal, and peculiar native vigour of mind. His sermons, several of which were published, produced a great effect upon the populace by their striking, though vulgar eloquence. His course and familiar images never failed to answer their purpose; and he possessed the faculty of associating his thoughts in such a manner as to prevent them from being easily forgotten.

PETERS, Richard, an eminent American judge and agriculturist, was born near Philadelphia, Aug. 22, 1744. He received his education in Philadelphia, at the college of which city he was graduated. In entering into active life, he was a good Latin and Greek scholar, and acquainted with the French and

German languages. He adopted the profession of the law, in which he obtained early and considerable success, particularly by means of his intimate knowledge of the land laws of the Commonwealth, and the fluency with which he spoke German. Even in his youth, he was distinguished for wit and humour. His powers of pleasantry were felt even by the Indians, when he accompanied a delegation from Pennsylvania to the Six Nations. The Indian chiefs, delighted with his vivacity, formally adopted him into their tribes. At the opening of the American revolution, Mr Peters became captain of a company of volunteers, but was soon transferred by congress to the board of war, in which he continued until the year 1781, when he resigned his post, and received from congress a vote of thanks for his services. He was closely connected with Robert Morris in all the exertions and sacrifices which were made for supplying the necessities of the American army. No one possessed more curious and instructive anecdotes of the distresses and trials of the American government. Some of these are well related in the sketch of his life by Samuel Breck, esquire. After Mr Peters quitted the war office, he was elected a member of congress. When the new government was organized, under the present constitution, president Washington offered him the place of comptroller of the treasury of the United States. This he declined, but accepted that of judge of the district court of Pennsylvania. He occupied this station for thirty-six years, until his death, always assiduous, and highly useful, particularly in admiralty cases. Agriculture and public works formed the chief objects of judge Peters, besides his duties on the bench. He was the first president of the company at whose expense the great bridge at Philadelphia, over the Schuylkill, was built. To him its preservation may be ascribed. The country is indebted to him, also, for the use of gypsum in agriculture. In 1797, he published a relation of his experiments with it on his own farm, which was widely circulated, and produced important improvements in American husbandry. He was president of the Philadelphia agricultural society, and enriched its memoirs with many valuable communications.

PETER'S, St; one of the largest tributary rivers of the Upper Mississippi. Its course is in the Missouri Territory, and it joins the Mississippi at the falls of St Anthony. The length of the St Peter's is 250 miles. It affords good navigation for boats, is 150 yards wide at its mouth, and has fifteen feet water.

PETERSBURG, St, capital of the Russian empire, occupying more space than any city in Europe, except London and Moscow, is situated at the mouth of the Neva, at the eastern extremity of the gulf of Finland; lat. 59° 56′ N.; lon. 29° 48′ E.; 485 miles north-west of Moscow, and about 1400 miles north-east of Paris and London. Petersburg is the seat of the court, of the senate, the holy synod, of a university, &c., &c., and, for beauty and splendour, surpasses every other city of Europe. The stranger wanders with admiration through the broad, regular streets, surrounded with the most magnificent palaces, churches with gilded towers, and other massive and colossal edifices; his eye every where rests on masterpieces of architecture. On entering the imperial gardens on the Neva, the majestic stream presents a fine prospect, with its ships, boats and bridges. On both banks are rich palaces, churches, and towers glittering with gold, charming islands, and beautiful gardens. Each side of the river is lined with a broad quay for the distance of nearly three miles. The excellent water of the Neva supplies the want of springs. The czar Peter the Great laid the foundations of the city during the northern war (1703), when he constructed a fort on an island in the Neva, for its defence against the Swedes. To superintend the work in person, Peter built a small wooden hut opposite it, which is still standing, and is now surrounded with a stone building to preserve it. Public and private buildings were soon erected, and the nobles and merchants of Moscow, Novgorod, &c., were induced to settle there, so that, in a short time, the place assumed the appearance of a considerable city, which, during the succeeding reigns, particularly in those of Catharine II. and Alexander, reached an almost unexampled degree of magnificence. The environs are level and low, in many places consisting of morasses: they therefore suffer from inundations, which sometimes occasion great ravages: in 1824, 15,000 persons perished by an inundation, which destroyed many villages, and caused great damage to the shipping. Petersburg is an open city, without walls, and only in some places surrounded with a ditch. Among the inhabitants there are a great number of foreigners, particularly Germans, who have intermixed much with the Russians, and fill many civil and military posts. The Neva divides the city into two parts, of which the southern or continental part is the largest and most populous: the northern part is again divided by a branch of the Neva. The city is divided into nine quarters—the three admiralty quarters, the foundery, the Moscow, the Jæmskoy, the Vasili-Ostrov, the Petersburg, and the Wiburg quarters. Each quarter is subdivided into districts, and these into inferior sections, at the head of each of which is a police-officer, usually a retired major. The whole organization of the police is military; and the military judges are too often entirely ignorant of the laws. When they find themselves embarrassed by the contradictory provisions of different ukases, they cut the knot, and, if the parties show any dissatisfaction with the decision, it is sealed by a blow or a kick. These inferior officers of police are subordinate to the police court in the centre of the city, the presiding officer of which is a general. In the admiralty quarter, which is the finest part of the city, is the imperial winter palace, on the banks of the Neva, the interior of which is adorned with statues and mythological figures. Catharine added to it a smaller palace, called the *Hermitage*. This building contains a rich collection of works of art, among which are a large number of original paintings of the great masters; and attached to it is a garden, in which, as in the garden of Calypso, reigns a perpetual spring. Some hundred paces distant, in the splendid street called the *Great Million*, is the Marble Palace, of colossal dimensions, which is built on a granite basement, and was given by Catharine to her favourite count Orloff. On the other side of the admiralty, which, towards the land side, is enclosed by a ditch and wall, is a walk planted with beautiful lime trees, and some of the finest buildings of the city, particularly Isaac's church, built entirely of marble (1766—1812), at an expense of 26,500,000 roubles, and which has, since its completion, been continually receiving additional embellishments. Not far off is seen the palace of the prince Labanoff, a gigantic work, even for Petersburg, and built at an enormous expense. Farther down, near the Neva, is the equestrian statue of Peter the Great, cast by Falconet. It stands in a spacious square, on an immense block of granite, about the size of a small house, and weighing above 800 tons. In Romanzoff place is a marble obelisk, erected by Catharine, in honour of Romanzoff's victories, and, in Suwarroff place, a bronze statue of Suwarroff.

Among the numerous remarkable edifices and institutions, we shall mention the academy of sciences, to which belongs a very valuable library, a cabinet of natural science, and an observatory; the new exchange, finished in 1816, a splendid building, surrounded by a colonnade of forty-four pillars; the house of the first corps of cadets, occupied by nearly 4000 men, and embracing a circuit of above a mile; the spacious building of the academy of fine arts, which, besides accommodations for 300—400 pupils, who are maintained and educated at the expense of the crown, contains every thing suitable for such an establishment; the second, or naval, mining, artillery and engineer cadet corps; the university (instituted in 1819), with its collections, and above fifty public institutions for education, supported at the expense of the state. These institutions lie in the Vasili-Ostrov (Basil's island), to which there is access from the continent by a bridge of boats. There are also similar institutions in other quarters of the city, particularly the great imperial gymnasium, and numerous benevolent establishments, such as military and other hospitals, the insane hospital, the institutions for the blind, and for the deaf and dumb, various medical and surgical establishments, the great foundling hospital, in which about 5000 children are nursed and educated, and in which the mother is permitted to lie-in without charges, and then to leave or take away her child, whether legitimate or not, without being questioned as to her name and station. With this is connected the great pawn-house, in which loans are made, even on real property. In all the institutions for instruction (as is also the case with the high schools throughout the empire), Russian, German, and French, and, in many, English, are taught: Latin and Greek are also publicly taught; and the young Russian shows a decided taste for dancing, music and painting. There are eleven public libraries; the most important is the imperial, containing 300,000 volumes and 12,000 manuscripts.

Among the palaces should be mentioned the splendid Michailoff palace, built by Paul, near the summer-garden, at an expense of 10,000,000 roubles; the Taurian palace, with its admirable gardens, built and occupied by Potemkin, and much enlarged and embellished by Catharine during his absence. The roofs of all the palaces, and most of the houses, are covered with thin iron plates, varnished black or green. The summer residences also deserve to be seen on account of their natural and artificial beauties.

Petersburg contains 115 churches for the established worship, and thirty-three for other rites. The most splendid are Isaac's church, and that of Our Lady of Kazan; the latter is of great dimensions; the nave and cupola are supported by fifty-six granite columns, with bronze capitals; the pavement is of different kinds of marble, the steps to the choir, of porphyry, with a silver balustrade. Among the towers, the most remarkable are that of the admiralty, and that of the fortress, of a pyramidal form, and more than half covered with plates of pure gold. Public worship is performed in fifteen languages, and according to eleven different rites. Organs and other instrumental music are not heard in the Russian churches, but singing is much cultivated. There are no seats in them. The worshippers come and go at pleasure, and are crowded together without distinction of rank, each as his feelings dictate, crossing himself, falling upon his knees, touching his forehead to the ground, and murmuring for the hundredth time, *Hospodin Pomilluy* (Lord, have mercy upon me). The Lutherans, Calvinists, Armenians, &c., have churches, and there is one Mohammedan house of prayer. The most remarkable monasteries are that of Alexander Newskoi, the residence of the metropolitan, and which contains, in a silver tomb, the bones of the saints, and the Smolnui nunnery. The commerce and navigation are very extensive; more than 1100 vessels, from all parts of Europe and from America, arrive yearly. Vessels which draw much water cannot come up to Petersburg, but unload by means of lighters at Cronstadt. Provisions are in general very high. As sources of amusement, we may mention the grand opera and other theatres; in winter sleigh-riding, and, in summer, sailing on the Neva; sliding down artificial elevations, &c., &c. The climate is very severe; the sleighing continues nearly five months. (See *Russia*.) In the neighbourhood are several imperial palaces, such as Peterhof, Kammenoi Ostrov, Pawlovsk and Zarskoi Zelo.

Population of St Petersburg in 1818, 313,000; in 1828, 422,166, of which only 124,722 were females. The census of 1832 gave the following results:—

Males,		294,468
Females,		154,900
		449,368
Among these were:—		
Ecclesiastics,		2,189
Nobles,		34,079
Soldiers,		39,437
Merchants,		10,828
Artisans,		24,179
Citizens,		36,762
Of the middle class,		66,366
Foreigners of various conditions, with the exception of merchants and artisans		7,190
Domestic servants,		94,000
Peasants,		127,865
Inhabitants of Ochta,		3,388
Births, males,	5,198	10 167
Births, females,	4,969	
Deaths of various diseases, males,	11,032	16,937
Deaths of various diseases, females,	5,229	
—— Accidental,	676	
Excess of deaths		6,770

This great excess of deaths is not to be ascribed to the insalubrity of the climate, but to the disproportion between the number of the sexes—the male population being nearly double that of the female. The number of families is of course not proportionate to the gross amount of the population; accordingly, the excess of deaths is found in the males, and ought to be deducted. See a Journey to St Petersburg, by Leitch Ritchie, 1835, 8vo.

PETER'S PENCE; a tax which England paid, from the eighth century down to the time of Henry VIII., to the pope. The Anglo-Saxon king Ina is said to have first granted it to the pope, in 725, in order to maintain a seminary of English ecclesiastics in Rome, and to keep in order the tombs of St Peter and St Paul in that city. It was collected every year on St Peter's day, one penny on every house, and considerably exceeded the income of the kings of England in the thirteenth century.

PETERWARDEIN, or PETERWARADIN (anciently *Acunum*); a town of Sclavonia, capital of a military district (see *Military Districts*), on the Danube, strongly fortified, thirty-eight miles north-west of Belgrade, 216 south-south-east of Vienna; lon. 19° 37′ E.; lat. 45° 16′ N.; population, 3847. It consists of the upper fortress, overlooking the Danube, the lower fortress, the horn work, and the suburbs. It is remarkable for the defeat of the Turks by prince Eugene in 1716. See *Eugene*.

PETHION, or PETION DE VILLENEUVE, JEROME, a French revolutionary statesman, originally an advocate at Chartres, was chosen deputy, by the *tiers état* of that city, to the states-general. The character, conduct and talents of Pethion have been variously represented; but his great influence over public affairs is a proof that he was not destitute of ability. In the early part of his career, he acted with Mirabeau, but did not join in such of his measures as were calculated to impede the extension of liberty and equality of rights. In October, 1789, he was appointed a member of the first committee of general safety, and, December 4, 1790, was elected president of the national assembly. In June following, he became president of the criminal tribunal of Paris, and together with Barnave and Latour-Maubourg, was appointed commissioner to attend the return of the monarch. He was elected mayor of Paris, November 14, 1791, and in consequence of his implication in the attack on the Tuileries, June 20, 1792, was suspended from his functions, July 6, but restored by the assembly on the 13th. His behaviour on the 10th of August has, by some, been interpreted as the result of weakness, and by others as the effect of design to avoid betraying his character as an abettor of the violence. Being nominated a deputy from the department of Eure and Loire to the convention which met in September, he became the first president of that assembly. Soon after the death of the king, Péthion was accused of having contributed to the massacres of September; but against this charge he successfully defended himself. He now, however, became the object of jealousy to Robespierre, and was included in the proscription of the Girondists, May 31, 1793. (See *Girondists.*) He made his escape, with some other deputies of the same party, to the department of Calvados, where they in vain endeavoured to avail themselves of the insurrections against the terrorists. Some time after, the body of Péthion, with that of Buzot, one of his confederates, was found in a field, in the department of the Gironde, half devoured by wolves, and it was supposed that he had perished from hunger. His works were printed in 1793, in 4 vols. 8vo.

PETION, Alexandre, president of the southern parts of the island Hayti, was a mulatto, and received his education in the military school of Paris. Being a man of cultivated understanding and attractive manners, and moreover well instructed in the art of war, he served in the French, and afterwards in the Haytian armies, with success and reputation. He was in high credit as a skilful engineer, in which capacity he rendered the most essential services to Toussaint and Dessalines, from whom he received many marks of attention, and rapid advancement in his profession. He succeeded Clervaux in the government of Port au Prince, and the command of the mulattoes, and held this post at the time of Dessalines' death. Petion was highly respected by the people for his talents and virtues; and upon the dissolution of the government by the death of Dessalines, the people of colour rallied around him as their chief, in preference to Christophe, who became the leader of the blacks. Christophe, deeming himself entitled to the undivided succession of Toussaint and Dessalines, the two chiefs took up arms, and had many rencounters, in one of which particularly, a pitched battle, fought January 1, 1807, Petion was defeated and pursued by Christophe to the very gates of Port au Prince. This campaign secured to Christophe a decided and unquestioned ascendency in the northern part of the island, where his chief strength lay. Still Petion's personal popularity, and the hostility of the mulattoes to the negroes, enabled him to maintain his ground at the south; and a bloody war ensued between the rival chieftains, of several years' duration, favourable, in its issue, to Christophe on the whole, but not sufficiently so to dispossess Petion of his power. Wearied, at length, of their unavailing struggle, both parties tacitly suspended the contest, and devoted themselves to the improvement of their respective dominions. Petion's government took the form of republican institutions, consisting of himself, as president for life, and a legislative body so constituted as to be completely under his influence. Petion was a man of fine talents and of honourable feelings and intentions, but not well adapted for the station which he was called upon to fill. The Haytians, just liberated from absolute slavery, without the education, habits of thought, moral energy and rectitude of character, which are necessary in a government perfectly republican, stood in need of a ruler less kind, gentle, and humane than Petion. In consequence of this, his people relaxed in their attention to agriculture, his finances became disorganized, and his country impoverished; and, disheartened at a state of things which he saw no means of remedying, he sank into a state of despondency, which ended in voluntary death. His final illness lasted only eight days, during which he resolutely refused all remedies, and every species of aliment, even to water, dying, at length, of mere inanition and despondency. His physicians, upon examining his body after death, found all its functions perfectly sound, and without any trace of malady. He died, March 29, 1818, and was succeeded by president Boyer.—Malo, *Haiti* (published 1825); Franklin's *Hayti*, ch. 8.

PETITION, in politics. The right of petitioning is indispensable to complete the constitutional or representative system. In absolute governments, and in those founded upon the ancient three estates, this right is often, or, we may say, almost always, denied to the citizen. As the present constitutional governments in Europe originated from one or the other of these forms, it has been considered necessary to provide for this right by express articles in their charters; otherwise it would be strange to mention this right any more than thousands of others which are not mentioned; for how can citizens be reasonably refused the liberty to make requests to governments established for their benefit? In Britain, there are certain laws enacted to prevent disorder, in case many citizens assemble to deliberate on the propriety of petitioning government for particular enactments. Since Charles II. (1662), it has been necessary for at least three justices of the peace of the county to give their consent if more than twenty persons wish to sign a petition. It cannot be presented by more than ten persons, and must be written in a respectful tone. Large assemblies must abstain from any breach of the peace, else the riot act may be read. In respect to meetings in the open air, some laws were enacted in 1819, to remain in force for five years; for instance, that no one should appear armed; that the inhabitants of but one parish should meet; that the meeting should be advertised six days beforehand; that the petition should be signed by seven householders at least, &c. The justices of the peace may also divide large parishes of more than 20,000 souls into districts of 10,000, that the assemblies may not be too numerous. Lately, however, meetings have been held attended by many more. In France, before the revolution, when the three estates assembled to choose deputies to the general estates of the realm, it was customary to provide them with *cahier de griefs et de doléance*, which, at the breaking out of the revolution, became important. The right of petitioning was then pronounced, and was greatly abused during the revolution, as may be easily imagined, on account of the disordered state of society. The right of petitioning by large numbers was then abolished. The charter re-established it.

PETITION OF RIGHT. The conflict between the crown and the parliament had already begun, in the reign of James I., when (1621) the house of commons framed the famous protestation that the liberties, franchises, privileges and jurisdictions of parliament are the ancient and undoubted birthright and inheritance of the subjects of England. This protestation James, with his own hand, tore out of the journal. The arbitrary measures of the first Stuart reign, the forced loans, benevolences, taxes imposed without consent of parliament, arbitrary imprisonments, the billeting of soldiers, &c., finally determined the commons to prepare a law which should protect the rights of the subject against further invasion; this they called a *petition of right*, as implying that it contained merely a corroboration or explanation of the ancient constitution, not any infringement of the royal prerogative, or acquisition of new liberties. It passed the commons and the upper house (1628), and, after some attempts, on the part of Charles I., to evade it, received the royal assent. After reciting the grievances above enumerated, it provides against their repetition as contrary to the laws and statutes of the realm, and the rights and liberties of the subject, and prays the king to declare that his officers and ministers should serve him according to the laws and statutes of the realm. The petition is given in full by Hume (note xx. to ch. 51.)

PETIT JURY. See *Jury*.

PETITIO PRINCIPII, in logic; the taking a thing for true, and drawing conclusions from it as such, when it requires to be proved before any inferences can be deduced from it.

PETIT TREASON. See *Treason*.

PETRARCA, FRANCESCO, or, as he is generally called by English writers, *Petrarch*, an Italian poet and scholar the ornament of the fourteenth century, was born of Florentine parents at Arezzo, in Tuscany, July 4 (or, according to some, July 20), 1304, and spent his youth at Ancisa in the Val d'Arno, Pisa, Carpentras, and Avignon, which was then the residence of the pope. The beauty of the environs of Avignon kindled his imagination. In 1318, he studied law at Montpellier, and, in 1322, at Bologna; but he was far more inclined to the study of the ancient classics, though his father burned many of the works which the young Petrarch had procured. Soon after his father's death, he left Bologna and the study of law, and, in 1326, returned to Avignon, and entered the ecclesiastical state. His diligence, talents, learning and eloquence soon procured him distinction, while his pleasing person and manners made him the favourite of the ladies and the great. Not being much confined by the duties of his several benefices, he followed the impulse of his genius, which led him to literary pursuits. He resided alternately at Avignon, Carpi, Parma, Selvapiana, Mantua, Milan, Padua, Verona, Venice, Rome, Vaucluse, and Linterno, an estate near Milan. He also made several journeys, visiting, in 1333, the countries on the Rhine, and various cities of France, Germany, and Flanders. We find interesting accounts of some of his travels in his *Epistolæ Familiares*. He also made the tour of Spain, and visited England; but of these excursions we have no account. He afterwards visited, in a public character, Naples, Venice, Avignon (in company with the celebrated Cola di Rienzi), Paris, and Prague. Prelates and nobles loaded him with proofs of their esteem, and the German emperor, Charles IV., in particular, conferred on him the title of count palatine, and corresponded with him. Petrarch communicated to him his patriotic wishes often with the most unrestrained boldness; for he was an ardent lover of his country. He exerted himself, especially in concert with Clement VI., to induce him to unite the Guelfs and Gibelines. He made his learning of general utility by his writings, and by opening to others the access to the sources of his own information, the works of the ancient classic writers. (See *Philology*.) He brought to light Cicero's *Epistolæ Familiares*, formed a collection of manuscripts with great labour, and, with Boccaccio, promoted the study of the Greek language in Italy, which he had himself learned but imperfectly, and at a late period of his life. One of the first places, therefore, is due to him among the restorers of ancient literature. He studied the ancient philosophers, historians, and poets, as far as they were then known, under the most discouraging difficulties, arising from the imperfection of the means; and he had more accurate philosophical notions, a more extensive knowledge of history, and a more correct taste, than any of his contemporaries. He paid particular attention to practical philosophy. In his lively dialogues, he endeavoured to inculcate just notions of life and conduct. One of these is his book *De Remediis utriusque Fortunæ*. With equal zeal he investigated ancient history, and attended, especially, to the ancient Roman monuments, for the preservation of which he earnestly exerted himself, and began to form a collection of imperial coins. The unexampled homage which was paid to Petrarch during his life, was founded chiefly on his profound acquaintance with ancient writers, displayed in his Latin works. His historical treatises prove his extensive reading; and he also wrote an *Itinerarium Syriacum*—a Guide to the Holy Land. His Latin, indeed, bears traces of the time in which he lived; but all will readily pardon this defect. He cultivated poetry not less than philosophy and history; and genius and study conspired to make him a poet. As models, he had the ancients and Provençal bards. The merits of Dante he seems not to have appreciated. His Latin poems are not, indeed, models, like those of the ancients, but they are excellent for the age in which he lived, and excited general admiration. They are eclogues, poetic epistles, and an epic entitled Africa, in which he celebrates Scipio, his favourite hero. It was never finished; but it gained him the poetic laurel, with which he was crowned in the capitol on Easter day, 1341, with the greatest parade. This poem he considered his best. His fame soon spread throughout Italy and the neighbouring countries. His reputation as a poet now rests on his beautiful Italian poems, published in 1327—1354, in which he far excelled his predecessors the Troubadours.

He was led to write poetry in his mother tongue, by his passion for the beautiful Laura. (q. v.) The ardent youth had just returned from the university of Bologna to Avignon, when, one morning in Passion-week (April 6, 1327), he went to the chapel of St Clara, according to his custom, where he saw Laura, full of youthful beauty and grace, and his whole soul was absorbed with the most ardent passion, which was increased by the charms of her mind. Laura was touched by his addresses; for she knew how to appreciate his merits, his constancy, and his admiration; yet she never forgot her character and her honour. She always kept him within the limits of propriety, and only vouchsafed to him a smile or a kind word, when moved to compassion by his fruitless love. He often resolved to tear himself away from her, because he felt how much his passion checked the activity of his mind. But he felt, likewise, that this passion had inspired him to high efforts, that he might deserve the regard of Laura. (See the canzone *Gentil mia Donna*.) He betook himself to travelling, and mingled in the bustle of the world; but in vain. The image of the object of his passion never left him. (See his beautiful canzone *Di Pensier in Pensier*.) He endeavoured to calm his passion by solitude; but it became more violent amid the hills and woods of Vaucluse, where he spent the principal part of his time in deep study. (See *Epistle* 116, and his sonnets and canzoni.) This love, however, did not extinguish all others; he had a natural son who died of the plague in 1361, and a daughter, who was married to a nobleman. The news of Laura's death, which reached him in Verona, April 8, 1348, was a severe blow to him; yet he did not cease to celebrate her. In his old age, however, he declared that he was ashamed of his youthful infatuation, and that he regretted having written his amatory poems. Yet he did not censure his love so much as its excess, and as he advanced in years, he became a contemner of the female sex. The account of his early passion is to be found chiefly in his Latin epistles, his treatise entitled My Secret, or On the Contempt of the World, and the poem the Triumph of Death. After a lapse of 500 years, we still enjoy the fruits of his love in those admirable sonnets and canzoni which paint the joys and sorrows, the admiration and desire, and all the tender thoughts and emotions of a poetic and glowing love. Petrarch is truly the prince of love poets; some of his poems may be censured for their monotony and the traces of the age in which they were written, for cold thoughts and allusions, false wit, a tasteless play upon words, and far-fetched epithets. But the greater part of them will ever be looked upon as among the most perfect masterpieces of lyric poetry. His poems contain many difficult passages, but numerous annotators have undertaken to explain them; as Gesualdo, Castelvetro, Velutello, Tassoni, and others. They have been published more than 200 times. His Latin works were printed at Basle, 1496 and 1581, and often separately.

Petrarch was likewise constant in his friendship. This we know from collections of his letters, which are likewise useful for their historical information. He was religious after the fashion of his age, venerated what was esteemed sacred by his contemporaries, observed fasts, bequeathed a portion of his property to the churches, revered saints, especially the Virgin Mary (to whom he wrote a canzonet full of humility and devotion), and relics. If we add to these characteristic traits, his gratitude to his instructers, faithfulness to his patrons, and universal benevolence, we can easily account for the esteem which he enjoyed; especially when we remember that he had a pleasing exterior to recommend his merits. In his youth he was well-formed, lively, fond of the most beautiful dresses (see *Var. Epist.*, ix.), and vain, and he played on the lute. His diligence was very great, and his talents brilliant. The events of the latter part of his life are his journey to Rome to attend the jubilee; the restoration of his property by the city of Florence; his invitation to the chair of professor in the new university in that city, which he refused; his visit to Italy, after the death of Clement VI.; the distinguished reception which he met from Galeazzo Visconti, at Milan, and Charles IV. at Mantua; the long desired removal of the papal chair to Rome, under Urban, in 1367, which was brought about by his influence; and his mediation of the peace between the Carrarese and the Venetians, in 1373. He died in 1374, as is supposed on the night of July 18, in the village of Arqua, near Padua, where he had retired to end his days. He was found dead early in the morning, in his library, with his head resting on a book. He was interred, with great pomp, at Arqua, although he had forbidden all ceremony. His valuable library he bequeathed to the republic of Venice; but no portion of it is now to be found. The account of his life is derived chiefly from his own writings—his Letters, his Secret, and his Address to Posterity on his life and character. The best of his biographers are the abbé de Sade (a descendant of his Laura), Tiraboschi, Baldelli, Fernow, Wismayr, Ugo Foscolo, Woodhouslee, Ginguené, &c.

PETREL (*thalassidroma*); a genus of oceanic birds, well known to seamen by the name of *Mother Carey's chickens*. They are found in every part of the world, on the ocean, at great distances from land, generally at twilight, or in stormy weather. They feed on small marine animals, and seeds of sea-weeds, and appear exceedingly fond of fat or grease, for which, and for the animals put in motion, they will follow in the wake of ships for great distances. They breed in rocks adjoining the sea, forming their nests in cavities; the female lays two eggs. They fly rapidly, and generally close to the water; and, when in pursuit of food, they suspend themselves by extending their wings, and appear to run on the surface of the water. Buffon says it is from this circumstance that they are called *petrels*, after the apostle Peter, who walked on the water. The appearance of these birds is considered by seamen to presage a storm, and it is thought peculiarly unlucky to kill one of them. There are four species, which are so closely allied to each other as to be generally confounded. C. Bonaparte, who paid much attention to this genus, designates them as follows—*T. Wilsonii* (stormy petrel); deep sooty black; tail even; wings reaching a little beyond its tip; tube of the nostrils recurved; tarsus one and a half inch long. *T. Leachii* (fork-tailed petrel); brownish black; tail forked; wings not reaching beyond the tip; tube of the nostrils straight; tarsus one inch long. *T. pelagica*; sooty black; tail even; wings reaching a little beyond it; tube of the nostrils almost straight; tarsus seven eighths of an inch long. *T. oceanica*; brownish black; tail slightly emarginate; wings reaching more than an inch beyond it; tube of the nostrils recurved; tarsus nearly one and three-fourths of an inch long. See *Puffin*.

PETRIFACTIONS. See *Organic Remains*.

PETROBRUSIANS. See *Sects*.

PETROLEUM. See *Bitumen*.

PETRONIUS, TITUS, surnamed *Arbiter*, a Roman author, notorious for his licentiousness and obscenity, was born at Marseilles, and lived in the court of Nero. He was, for a time, the favourite of the emperor, who made him master (arbiter) of his voluptuous banquets and revelries. But he finally fell a victim to the suspicions of the tyrant, by whose command he was obliged to put himself to death. The corruption and dissoluteness of Roman manners, at that period, are portrayed in the fragments of the *Satyricon Libri*, in which Petronius describes, in prose and in verse, the profligacy of the times, and which are, therefore, valuable, at least as a picture of manners. Some attribute it, on account of several allusions, to another author, who lived for some time, in the reign of Commodus, in Naples. The best critical edition is that of Burmann (Leyden, 1743, 2 vols., 4to); there is a later edition, by Anton, on the basis of Burmann's (Leipsic, 1781). The supposed supplements, lately discovered, are spurious.

PETTY BAG; an office in chancery, in England, the three clerks of which record the return of all inquisitions out of every county, and make all patents of comptrollers, gaugers, customers, &c.

PEUTINGER TABLE; a map showing the military roads of the greater part of the kingdom of the Visigoths, drawn, it was formerly believed, for Theodosius the Great. It is called after Conrad Peutinger, a German scholar, born 1465, and who died in 1547. Among his papers was this famous map. Conrad Celtes had found it in the Benedictine monastery of Tegernsee, borrowed and not returned it. Such a *mappa mundi in rotulo* was extant in that convent, in 1504; and the *Tabula Peutingeriana* at Vienna, is probably the same which Werinher, a poet, made or copied in 1190. Celtes gave this map to Peutinger, who intended to publish it. After his death, it disappeared for many years, until Marx Welser published fragments of it, under the title of *Fragmenta Tabulæ antiquæ ex Peutingerorum Bibliotheca* (Venice, 1591). It was not found entire, among Peutinger's manuscripts, until the eighteenth century, when Scheyb published a beautiful impression, with remarks, folio (Vienna, 1753). The manuscript of the map is at present in the imperial library at Vienna. The characters and figures show that the map is not the original. Docen thinks that it belongs to the twelfth century. A new impression of this ancient map was published in Leipsic (1824), not entirely free from faults, with a treatise by Mannert. A new edition, with commentaries, has been announced by Dr Tross, of Munster. Peutinger was the first who collected Roman inscriptions on stone, in a small work,—*Romanæ Vetustatis Fragmenta* (Augsburg, 1505). He wrote, besides, other valuable works on the decline of the Roman empire. Peutinger long held important public offices.

PEWTER consists of tin alloyed with a quantity of copper, or other metallic bodies, as the experience of the workmen has shown to be the most conducive to the improvement of its hardness and colour, such as lead, zinc, bismuth, and antimony. The best sort of pewter is formed from antimony seventeen parts, tin 100 parts. The French add a little copper to this kind of pewter. A very fine silver-looking metal is composed of 100 pounds of tin, eight of antimony, one of bismuth, and four of copper.

PEYROUSE, La. See *Lapérouse.*

PFEFFEL, Christian Frederic, a jurisconsult and diplomatist, born at Colmar, in 1726, became secretary to the ambassador from Saxony to France, and was employed in several negotiations. In 1758, he was sent to Ratisbon, during the diet, as *chargé d'affaires*, and thence to the court of Bavaria, where he remained until 1768, when he was recalled to Versailles, and became jurisconsult to the king. In 1790, he was sent, by the French ministry, to Deux Ponts, to treat of the indemnities of the German princes, and was still there when he received his dismission from his public functions; his property was confiscated, and he was placed on the list of emigrants. He remained in the service of the duke of Deux Ponts until 1795, when he retired to Nuremberg, and died in 1807. His principal works are *Abrégé Chronologique de l'Histoire, et du Droit publique d'Allemagne; Recherches Historiques concernant les Droits du Pape sur la Ville et l'Etat d'Avignon; Etat de la Pologne; Dissertations Historiques.*

PFEFFEL, Gottlieb Conrad, a distinguished German author, was born in Colmar, Alsatia, in 1736, of Protestant parents. He went to Halle in his fifteenth year, to study law. In 1757, he became blind. This misfortune he bore, for more than fifty years, with wise cheerfulness, and became a most useful citizen. In 1773, he established a Protestant school at Colmar, with the approbation of the king of France, in which he educated many excellent scholars. The revolution put an end to the institution. In 1803, he was made president of the newly-established Protestant consistory at Colmar, and died May 1, 1809. He is one of the best poets of Germany, in the department of the fable, and tales in verse. His poetical works are collected in his *Poetische Versuche*, 10 vols., 2d edit. (Tubingen, 1817), and his prose writings in *Prosaiche Versuche* (Tubingen, 1810, 8 vols.) His biography forms the last volume.

PFYFER, Louis, born at Lucerne, in 1715, entered the French military service at an early age, distinguished himself in the campaigns from 1734 to 1747, in 1748 was made major-general, and, in 1763, lieutenant-general. At Lucerne is still shown a plan, in relief, of a part of the interior of Switzerland, executed by him. It is remarkable for its minute accuracy and truth of presentation.

PHÆDON, of Elis; a scholar of Socrates, and founder of a school of philosophy in Elis. The dialogue of Plato, on the immortality of the soul, which contains the last conversation of Socrates with his scholars, while he was in prison, also bears this name. Mendelssohn has given the same title to his conversations on the same subject; but the dialogues written by Phædon himself are lost.

PHÆDRA; in fabulous history, daughter of Minos, king of Crete and of Pasiphae, sister of Ariadne and wife of Theseus. Happening to meet Hippolytus, her step-son, whom she had never before seen, and whom she did not know to be the son of Theseus, she was inflamed with an ardent passion for the beautiful youth. He would not reciprocate her passion, and, to satisfy her revenge, she accused him to her husband of a criminal attempt upon her honour. The father cursed his son, and Neptune soon carried his execrations into effect by bringing upon Hippolytus a violent death. When this event was known in Athens, Phædra repented of her crime, and hanged herself. According to some, she was killed by Theseus. Sophocles and Euripides, two of the most celebrated poets of antiquity, have taken Phædra as the subject of their tragedies, which are now lost. Racine has followed their example.

PHÆDRUS; a Latin fabulist, born in Thrace. He was probably brought to Rome as a slave, at a tender age, and entered the service of Augustus, who liberated him. Nothing is known of his life, except that he suffered much from the tyranny of Sejanus under the reign of Tiberius; spent his days probably in moderate circumstances, and died at an advanced age. He wrote five books of fables in iambic verse, which are distinguished for their purity and elegance of expression, and for their simplicity and instructive thought. He borrowed his materials in part from Æsop, and mixed with them his own inventions. The work of Phædrus is no where mentioned among the ancients, and Seneca goes so far as to say the Romans had no fables in the manner of Æsop. The moderns knew nothing of his writings till 1595, when a copy was found by Francis Pithou, in the library of St Remi at Rheims. He sent it to his brother Peter, who gave it to the world. The best editions are by Burmann (2 vols., Leyden, 1727, 4to), and the most complete by Schwabe (Brunswick, 1806). Christ first doubted the genuineness of the fables of Phædrus. Several modern philologists regard them as spurious, and the work of a later age. This is certain in regard to thirty-two new fables, first published by Cassitti at Naples, under the name of *Phædrus*, but made known previously to the learned Burmann by Dorville from Perotti's manuscript. These fables have been several times reprinted since 1812.

PHAETON; in heathen mythology, the offspring of the sun and Clymene, and brother of the Heliades. To please his unfortunate mother, and to satisfy those who doubted whether the sun were his father, he desired the latter to grant him a favour. Phœbus imprudently promised it, unconditionally, and swore by the Styx that he would, at all events, keep his word. Phaeton now asked permission to take his father's place in the chariot of the sun, and would not be denied. But he had scarcely mounted the flaming car, and taken the reins, when the celestial horses, despising their weak driver, turned out of the path, and set every thing on fire. The Ethiopians, on the left, were blackened by the near approach of the sun; and, when the chariot was drawn over the earth to the right, Jupiter, with his bolts, plunged the thoughtless charioteer into the river Po. His sisters found him there lifeless, and lamented him.—The god of the sun was also called *Phaeton* (the enlightener). In modern times this name is given to a sort of high, light, open carriage.

PHALANX; a body of troops among the Greeks, armed with long spears, and arranged in the form of a square. The momentum of their onset usually decided the battle. The phalanx at first consisted of 4000 men, but was afterwards doubled, and even quadrupled. It was first doubled by Philip of Macedon, and the double phalanx is hence often called the *Macedonian phalanx*. The phalanx was commonly sixteen deep, and the men were drawn up shield to shield; the rear ranks, which could not reach the enemy with their spears, held them upon the shoulders of those before them, and thus formed a sort of wall to stop the progress of the missiles of the enemy. The phalanx is much celebrated in the history of ancient wars, on account of its invincibleness.

PHALARIS. This prince, notorious for his cruelty, was a native of Astypalea, in Crete. On his banishment from that place, he went to Sicily, where he made himself master of Agrigentum, about B. C. 571, and sought to maintain his power by cruelty and severity. The most famous instance of his cruelty was the barbarous punishment of the brazen bull prepared by Perillus of Athens. The victim was shut up in the body of the bull, and roasted slowly by a fire underneath. The screams of pain uttered by the unhappy man were made, by some machinery, to resemble the lowing of a bull. Phalaris caused the first experiment to be tried on the inventor. After a reign of about sixteen years, he was killed during a rebellion. The letters which bear the name of *Phalaris* have been fully proved to be spurious by Bentley, in his celebrated controversy with Boyle. The latest edition is that by Lennep (Groningen, 1777, 2 vols., 4to).

PHALAROPE (*phalaropus*.) A genus of shore birds, belonging to the family *longirostres*, Cuvier. They live in small flocks on the sea-coasts, sometimes, but rarely in fresh-water lakes; feed on aquatic insects and molluscous animals. The female builds on the shore among the grass, laying from four to six eggs. Both sexes incubate, and attend on the young, which leave the nest, run about, and swim, soon after they are hatched. These birds fly well, and swim expertly, resisting the heaviest waves, but never dive. Their flesh is oily and unpalatable. They inhabit far north, migrating in the autumn and winter to the temperate regions of both continents. There are but three species as yet known, which have been placed by authors in different families, and even orders. C. Bonaparte has thus arranged them: Sub-genus, *phalaropus*, *P. fulicarius* (red phalarope). This is the *P. hyperboreus* of Wilson; blackish, varied with ferruginous; beneath rufous; winter-dress cinereous, beneath white; inhabits both continents. Sub-genus, *lobipes*, *P. hyperboreus* (northern phalarope). Inhabits both continents; common in the Hebrides. It is black, varied with rufous, beneath white, sides of the neck bright rufous; winter plumage cinereous, beneath white. Sub-genus *holopodius*, *P. Wilsonii* (gray phalarope.) This is the *P. lobatus* of Wilson; bluish gray, beneath white, with a chestnut patch and a black band on each side of the neck; summer plumage unknown; inhabits the north of America, migrating in winter as far south as the coast of Mexico.

PHAMENOPHIS. See *Memnon*.

PHANAR. See *Fanariots*.

PHANTASM. See *Spectre*.

PHANTASMAGORIA. See *Lantern*.

PHANTASOS. See *Morpheus*.

PHAON. See *Sappho*.

PHARAOH. See *Egypt*.

PHARISEES; the members of a sect among the Jews, which seems to have arisen in the time of the Maccabees. Besides the books of Moses, they held a multitude of doctrines and traditions, supposed to have been received orally from that lawgiver, with the annotations of later teachers after the captivity. These traditions they thought themselves obliged to observe as strictly as the laws of Moses. They were distinguished from the Sadducees by their zeal for their traditions, and their belief in the resurrection of the dead. Their ambition, and the narrowness of their religious views, made them hypocrites. With a lax morality, they thought to obtain the favour of the Supreme Being by external holiness and ascetic expiations; and they sought to gain the good opinion of men by a high tone of justice and piety. The Pharisees numbered in their ranks the most distinguished lawyers and statesmen in Judea; and, as persons of all conditions, not excluding females, were admitted into their society, they gained a political influence which often decided the fate of the Jewish nation under the Maccabees and Asmoneans, and brought into their hands the power which had been left to the great council by the Romans in the time of Christ. The doctrines of the Pharisees have prevailed in the religion of the modern Jews, and in the Talmud. The term *Pharisee* is also applied to a person whose character resembles that of the Pharisees of the New Testament.

PHARMACOLITE. See *Lime*.

PHARMACOPŒIA (from *φαρμακον*, medicine, and *ποιεω*, to make); the same as *dispensatory*. (q. v.)

PHARMACY, PHARMACEUTICS (*φαρμακον*, drug); the art of preserving, preparing, compounding and combining substances for medical purposes; the art of the apothecary. As these substances may be mineral, vegetable or animal, theoretical pharmacy requires a knowledge of botany, zoology and mineralogy, and, as it is necessary to determine their properties, and the laws of their composition and decomposition, of chemistry also. In a narrower sense, pharmacy is merely the art of compounding and mixing drugs according to the prescription of the physician. These processes and substances have been described under their appropriate heads. (See *the separate articles*.) The preparation of medicines was at first performed by the physicians themselves, who also administered them to their patients; and it first became a distinct branch of medical science at Alexandria, towards the beginning of the fourth century B. C. (see *Medicine*) when some physicians devoted themselves solely to it. Afterwards it became the employment of particular individuals (*rhizotomists*, simplers), and the medical science and the apothecary's art thus became separated from each other. Mantias, a pupil of Herophilus, in Alexandria, seems to have been the author of the first pharmacopœia, having published a work on the preparation of medicines. Zeno of Laodicea distinguished himself by the invention of a large number of compound medicines. Princes also studied the medical sciences, particularly in reference to the preparation of poisons and antidotes. Thus Attalus, last king of Pergamus (B. C. 134), was noted for his medical skill, and his knowledge of plants, and several preparations which he invented, are known to us; as, for instance, an ointment of white lead or ceruse, &c. Mithridates, king of Pontus (123—62 B. C.), invented an antidote, composed of fifty-four ingredients. Heras, of Cappadocia, wrote a work on pharmacy at Rome (B. C. 49). Musa, the celebrated physician to Augustus, prescribed several medicinal preparations, which afterwards continued in use under his name. A large collection of compound medicines is enumerated in the works of Scribonius Largus (A. D. 43). Menecrates, physician to Tiberius, was the inventor of the diachylon, or litharge plaster. Damocrates (A. D. 47) invented and described in verse, the preparation of several medicines, tooth-powder, ointments, &c. Philo of Tarsus (A. D. 23) discovered a sedative composed of opium, saffron and other ingredients, and called, from him, *philonium*. Æsclepiades Pharmacion (in the time of Trajan, A. D. 97) prepared several celebrated medicines. Dioscorides, who probably flourished in the reign of Nero (A. D. 34), is yet distinguished for his knowledge of the properties of plants, and first exposed the fraudulent practices made use of in the composition of several medicines, and prescribed the preparation of some new ones; as, for instance, of ceruse, calamine, flowers of zinc (*nihil album*), &c. Pliny the Elder (79) also rendered important services to pharmacy by his researches into natural history. In Galen's time (160—200) several physicians in Rome employed themselves in the preparation of cosmetics. When, with the decline of the Roman empire, science and learning became extinct in Western Europe, superstition and blind empiricism prevailed in the medical department, and pharmacy made no progress. But, in the East, particularly in Alexandria, where art and science continued to flourish, chemistry and pharmacy were cultivated with ardour by the Arabians. They studied the works of the Greek writers, and from them we derive many important improvements in the pharmaceutic art. The caliph Almansor (754) founded in Bagdad the first public *apotheca*, or druggist's shop. The names of several medicines, such as alcohol, julep, &c., are of Arabian origin, and it is most probable that we owe to them the first official dispensatories, or pharmacopœias. Sabor Ebn Sahel, about the middle of the ninth century, published a pharmacopœia; and, in the twelfth century, Abul Hassan, physician to the caliph of Bagdad, published a similar work, which subsequently served as the standard work of the Arabian apothecaries. The Arabian apothecas were under the particular direction of the government, and were subjected to a strict supervision, particularly in regard to the quality and price of drugs. It is related of Affhin, an Arabian general, that he examined in person the medicine chest of his army, to see if every thing mentioned in the dispensatories was provided. With the revival of medical science in the West arose the celebrated school of Salerno. The apothecary's trade was now (in the thirteenth century) regulated by law, and apothecaries and grocers were obliged to sell their articles at fixed prices. Apothecas, or apothecaries' halls, could be established only in certain places, and two men of standing were appointed in the large towns to superintend them. The most important medicines were compounded under their inspection, and frauds were severely punished. There is a work by Saladin of Ascoli, physician to the grand constable of Naples, in the fifteenth century, which, besides other curious materials relating to the state of the apothecaries' trade at that period, contains a list of the books which an apothecary ought to have, with moral precepts and directions for each month. The principal pharmaceutical work of the middle ages was the *Antidotarium* of Nicholas Præpositus of Salernum, which was celebrated as early as the twelfth century. In France, the apothecaries' halls were first subjected to the supervision of the medical faculty in the fifteenth century. In Germany, the apothecaries were merely dealers in drugs, which they imported from Italy. The physicians also prepared their own prescriptions. In most cities, the apothecaries were likewise confectioners, and the magistrates, in their contracts with them, stipulated for a certain quantity of confectionary, to be delivered in the city hall. The reforms of Paracelsus in medicine (sixteenth century) introduced some changes into pharmacy. Many chemical preparations were adopted, and the use of mineral specifics, as, for example, antimony and mercury, became more common. Still the operations were conducted without reference to scientific principles; but, since the middle of the seventeenth century, the natural sciences have continued to make great progress, and pharmacy, as well as medicine, has experienced the effects of the improvement. In pharmaceutical operations, the apothecaries' weight is used, in which twenty grains make a scruple, three scruples a drachm, eight drachms an ounce, and twelve ounces a pound. The following abbreviations and signs are used by physicians, in writing their prescriptions:

℔.	pound.
℥.	ounce.
ʒ.	drachm.
℈.	scruple.
Gr.	grain.
C.	(*congium*) gallon
O.	(*octans*) pint.
f. ℥.	fluid ounce.
f. ʒ.	fluid drachm.
♏.	minim.
Gut.	(*gutta*) drop.
Cochl.	(*cochleare*) spoonful.
Cochl. maj.	(*cochleare majus*) table-spoon.
Cochl. min.	(*cochleare minus*) tea-spoon.
Manip.	(*manipulus*) handful.
j. i.	one.
ss.	half.
āā or ana.	of each.
q. s.	(*quantum sufficit*) as much as necessary.
p. e.	equal parts.

PHARO; a game. See *Faro*.

PHARO of Messina. See *Faro of Messina*.

PHAROS; sometimes used, in English, for *lighthouse*: in some other languages, it is the ordinary term for these edifices. The name is derived from the island of Pharos before Alexandria, which protected the port of that city. On the eastern promontory of the island stood the lighthouse of Alexandria, so famous in antiquity, and considered one of the wonders of the world, built 300 years B. C. It is said to have been 500 feet high. See *Lighthouse*.

PHARSALIA; the plains in the neighbourhood of Pharsalus, a town of Thessaly, where Cæsar defeated Pompey B. C. 48. See *Cæsar* and *Lucan*.

PHASES, in astronomy, denote the various appearances of the moon, and the superior planets, at different ages; also the appearance of the moon or sun when eclipsed. Metaphorically, the word is used by historians, to designate various stages and appearances of one great historical event, for example, a revolution.

PHEASANT (*phasianus*). The genus *phasianus* includes not only the pheasants proper, but also the common domestic fowl. (See *Cock*.) The true pheasant is distinguished by having a long tail, the feathers of which are of different lengths, and overlay each other like tiles. The most common species is the *P. Colchicus*, originally a native of the East, but now naturalized in many parts of Europe, especially in the southern parts. In their wild state, these birds feed, like the rest of the gallinaceous tribe, upon vegetable food: when young, however, they principally subsist on insects, and are exceedingly fond of ants' eggs. The female constructs her nest in some retired spot, forming it of leaves, and without grass. The number of eggs she lays is various; for, if they are carried away, she continues, like the common hen, to lay an additional quantity. The males and females only associate together in the first spring months. When disturbed, they make a whirring noise, like the partridge, and, from being a large mark, and flying slowly, they are readily brought down, even by an inexperienced sportsman. There are several varieties, produced by climate and domestication, among which is the white. The golden pheasant (*P. pictus*), a native of China, is remarkable for the beauty of its plumage: the prevailing colours are red, yellow and blue, and it is distinguished by a crest upon the head, which can be raised at pleasure. The iris, bill and legs are yellow. The tail is long, and richly tinted, and from above it arise a number of long, straight feathers, of a scarlet hue, mixed with yellow. Cuvier is of opinion that the description given by Pliny of the phœnix (lib. x. cap. 2) is meant for this bird. Another fine species found in China is the silver pheasant (*P. nycthemerus*). This is of a silvery white colour, with very delicate black lines on each feather, and black belly. The most splendid bird of this genus, and perhaps of the feathered race, is the argus pheasant (*P. argus*). This species, which is of a large size, is an inhabitant of the mountains in the island of Sumatra, and perhaps of others of the Indian islands. The male has a very long tail, and the feathers of the wings are large, and much produced, the whole thickly covered with ocellate spots, giving to the bird a most extraordinary aspect. There are several other species of this genus, which inhabit different parts of Asia: none, however, have yet been discovered in America.

PHELLOPLASTICS (from φελλος, cork); the art of representing works of architecture on a reduced scale in cork, invented by an artist in Rome, between 1780 and 1790, and improved by a German named Mey. The phelloplastic works afford very fine models, and are cheaper than models in wood, gypsum, stone, or *papier maché*.

PHERECYDES; a celebrated sage of ancient Greece. He is regarded as the first who wrote in prose, on philosophy and religion, although his expression, as is natural, inclines much to poetry. He was a native of the island of Syros, flourished in the sixth century, B. C., and was a contemporary of Thales. The fragments of his work on nature and the gods, are merely allegorical thoughts. Sturz collected them (2d edit., Gera, 1798). Pherecydes considered Jupiter or αιθηρ, Time or χρονος, and the earth, which he esteemed a chaos, as the elements of all things. According to Cicero, he was the first that taught the immortality of the soul; he was also the instructer of Pythagoras.

PHIDIAS of Athens; the great master of statuary, who, in the age of Pericles (about the 84th Olympiad, or B. C. 444), embodied the lofty ideal of a Pallas-Minerva and an Olympian Jove. According to Bottiger, Phidias executed three statues of Pallas, which were all in the Acropolis in the time of Pausanias. One colossal statue of Pallas, he cast in bronze (taken from the tenth of the spoils won on the plains of Marathon), for the temple of Minerva Polias, in which she was represented as a guardian deity. Mys wrought upon her shield, in relievo, the battle of the Centaurs, from designs by Parrhasius. Near the statue stood the primitive possessor of the mount, an owl. It is related of this statue, that mariners, doubling the promontory of Sunium, still saw her crested helmet and the point of her spear. The second of his most famous statues was made of ivory and gold. It was denominated the statue of the Parthenon, or Parthenos (the virgin), and measured, with the pedestal, about 41½ English feet. Instead of marble, he made use of ivory, which admitted of a much softer and more brilliant polish. It was, in reality, formed of wood, overlaid with ivory. He threw over it a garment of gold, either beaten or cast with such exquisite skill, that it might be put off or on at pleasure, and could be weighed, at any time, by the treasurer of the temple. It weighed forty-four talents. During the government of Demetrius Poliorcetes, it was carried off. The eyes were of marble, let in, and probably painted, according to the prevailing custom. The goddess stood upright, with the ægis on her breast and a spear in her left hand. There was likewise an immense serpent, or dragon, near her, supposed to be that of Ericthonius. In her right hand was the goddess Victoria, formed in like manner of ivory, with a vestment of gold, four cubits high. By her side stood the great shield, representing, on the convex side, the battle of the Amazons, and on the concave, the battle of the Titans. The different parts of the statue, as well as the pedestal, were wrought in relievo. Thus, for example, Phidias introduced himself and Pericles on the shield. A complete description of this statue is given in Bottiger's *Andeutungen uber die Archaologie* (Observations on Archæology). The third statue, in bronze, of a smaller size, which was called, emphatically, the *beautiful*, on account of its exquisite proportions, was purchased by the people of Lemnos, and sent by them to the Acropolis of Athens. The Olympian Jupiter of Phidias represented the serene majesty of the king of heaven, and was ranked for its beauty, among the wonders of the world. Jupiter was here seen sitting upon a throne, with an olive wreath of gold about his temples; the upper part of his body was naked; a wide mantle, covering the rest of it, hung down, in the richest folds, to his feet, which rested on a footstool. The naked parts of the statue were of ivory, the dress was of beaten gold, with an imitation of embroidery painted by Panænus, brother of Phidias. In the right hand stood the goddess Victoria, turning towards the statue, and carved, like it, out of ivory and gold; she was holding out a band, with which she appeared desirous to encircle his olive crown. In his left hand, the divinity held a parti-coloured sceptre, made of various metals skilfully joined, and on the sceptre rested an eagle. Power, wisdom and goodness were admirably expressed in his features. He sat with the air of a divinity, presiding among the judges of the games, and dispensing the laurel wreaths to the victors, calm in conscious dignity, the *beau ideal* of Greek anthropomorphism. Cicero (*De Oratore*, ii.) relates that the artist was led, by a passage in the Iliad, to imagine such a figure. The statue was surrounded with magnificent drapery, which was drawn aside only on particular occasions, when the deity was to be exhibited. A sense of greatness and splendour overwhelmed the spectator. There was also a splendid statue of Nemesis at Rhamnus, falsely ascribed to Argoracritus, the favourite of Phidias. He made it of a block of Parian marble, which the Persians had designed as the monument of their victory. From Phidias that elevated style, which is so much admired, is commonly supposed to have been derived; and modern antiquarians maintain that after his death Grecian art began to decline. Phidias was, moreover, an architect. By the exertions of Pericles, Athens was made the most magnificent city in Greece. During his government, which lasted twenty years, the city was adorned with more costly temples, colonnades, and other works of art, than Rome, though mistress of the world, could boast in seven centuries. Every one was anxious to do something for the ornament of the city of Pallas. The best materials and most skilful artists were there in abundance. Phidias superintended these improvements; and the sculptures with which the Parthenon, for instance, among other buildings, was adorned, were partly his own work, and partly in the spirit and after the ideas of this great master. Phidias received great honours from the Athenians, for whose fame he was labouring, while Pericles had the sovereign power; but he was subjected to a change of fortune when the popularity of his patron declined. He died in prison. The cause of his death is unknown.—See Emeric David, *Examen des Inculpations dirigées contre Phidias* (Examination of the Charges brought against Phidias; Paris,) and C. O. Muller, *De Phidiæ Vita et Operibus, etc.* (the Life and Works of Phidias; Gottingen, 1827, 4to).

PHILADELPHIA, the second city in size in the United States of America, is situated in a county of the same name, in the state of Pennsylvania, between the Delaware and Schuylkill rivers, five miles above their junction, in lat. 39° 57′ N., and lon. 75° 10′ 59″ W. from Greenwich, and is about 120 miles distant from the Atlantic ocean by the course of the river, and about fifty-five miles from it in a direct line to the south-east. The name is composed of two Greek words,—*φίλος*, a friend, and *ἀδελφος*, a brother. Proud, the historian (upon what authority is not known,) states that the Indian name of the place was *Coaquenaku*, which Heckewelder translates into "the grove of tall pines." The city was founded by William Penn in the year 1682. The original city was a parallelogram, extending west about two miles from the Delaware, beyond the Schuylkill, and north and south a little more than a mile. As commerce and other business increased, the buildings were naturally extended along the Delaware, and now reach from the lower part of Southwark to the upper part of Kensington, near four miles, and from one river to the other. The main streets, running north and south, are twenty-five in number, and those from east to west fourteen, in the city proper, all of which cross at right angles, except Dock-street. These streets are handsomely paved with round stones, and kept remarkably clean. The foot-ways are paved with brick, and defended from the approach of carriages by ranges of curbstone. Numerous smaller streets and alleys divide the different squares, and are paved in like manner. The whole number, in the city and districts, is about 600. The streets vary much in width. Broad-street is 113 feet; High-street, or Market-street, 100; Arch-street, 60 feet; and the others of various width. Common sewers have been formed under most of the main streets, which carry the filth into the Delaware, and preserve the health, and contribute to the comfort of the inhabitants. The houses exhibit an appearance of neatness, uniformity, and commodiousness, and most of them are ornamented with white marble steps and window sills.

September 5, 1774, the members of the first congress convened at Philadelphia, where they adopted that celebrated declaration of rights which may be considered the preface to the declaration of independence. Within two years after, the eternal separation of the United States from Britain was decreed by that august body, and proclaimed to the people from the state-house. Congress continued to sit at Philadelphia until the approach of the British, at the close of the autumn of 1776, compelled them to retire to Baltimore. The city fell into the possession of the British forces, September 26, 1777, and they occupied it until the 18th of June following. During the remainder of the war, it happily escaped the ravages of hostile operations. It was also the seat of the state government until the year 1800. For municipal purposes the legislature has, from time to time, established corporate governments in different parts of the suburbs, so that Philadelphia is divided into the following districts:—The corporations of the city of Philadelphia, of the Northern Liberties, Kensington, Spring-Garden, Southwark, and Moyamensing. The municipal government of the city proper is vested in a mayor, a recorder, fifteen aldermen, and a select and common council, besides subordinate executive officers. The recorder and aldermen are appointed by the governor of the state, and hold their offices during good behaviour. The mayor was annually chosen by the councils from among the aldermen until April 10, 1826, when the legislature passed an act authorizing the councils to elect him from the body of the citizens. The members of the select and common councils are annually chosen by the people on the day of the general election. They receive no compensation, sit in separate chambers, and each body has a negative on the legislative acts of the other. The mayor, recorder, and aldermen, or any four of them, whereof the mayor or recorder must be one, constitute the mayor's court, which has the same jurisdiction of offences committed in the city, as the quarter-sessions in their respective counties. The aldermen have respectively the powers, and perform the duties, of justices of the peace, as to all matters arising within the city. This form of government was established in 1796. The city proper sends seven representatives and two senators to the state legislature. The population of Philadelphia, according to the census of 1810, was 96,664; in 1820 it was 119,325; and in 1830 it was 167,811.

Philadelphia now contains about one hundred places of public worship, few of which are distinguished for architecture or extent. Institutions for the relief of the unfortunate, sick and helpless abound, at the head of which is the Pennsylvania hospital, which was founded in the year 1750. The buildings occupy an entire square, and in the front of them stands a leaden statue of William Penn. The public alms-house is built upon the square adjoining, the annual expenses of which are about 50,000 dollars. The asylums for widows and orphans, and the institution for the deaf and dumb, deserve a passing notice. The latter building was erected in 1824; it is constructed of granite. The whole front is ninety-six feet six inches, and sixty-three feet in depth. The annual expenditures are about 11,000 dollars. The institution was established in April, 1820. In the following year it was incorporated, received a donation of 8000 dollars from the state, and an additional appropriation, for the support and education of fifty indigent pupils of the state, for the term of three years. By subsequent acts, this grant for charity students has been made to continue until April, 1833. In 1828, the legislature of Maryland appropriated 3500 dollars annually, for five years, for the education of indigent deaf and dumb persons, of that state, in this institution. The legislature of New Jersey also has, for several years past, provided for an indefinite number of her own deaf and dumb poor, not exceeding twelve at any one time, to be educated at the option of their parents, either in this institution or in the one at New York. These, together with occasional private donations and funds, derived from paying-pupils, received from any part of the country, at the rate of 160 dollars per annum, and the life and annual subscriptions of the society which established the institution, are the means by which it has been hitherto sustained and enabled to accomplish much good. The number of its pupils, in May, 1830, was seventy-six. The object of this school is to give a good common education to deaf-mutes, and to train them to industrious habits. The course of instruction varies from four to six years. The system pursued is that of the abbés De l'Epée and Sicard. A grand lodge of modern masons appears to have existed in Philadelphia as early as 1732. The masonic lodge (a building more remarkable for its size than architectural beauty) was erected in 1809. The house of refuge, so highly important to public morals, was projected in 1826. Private donations being inadequate to the undertaking, legislative assistance and a liberal donation from the county of Philadelphia enabled the managers to complete the buildings. A plot of ground, 400 feet in length from east to west, and 231 feet in breadth from north to south, bounded by streets on all sides, has been enclosed by a stone wall twenty feet in height. The main edifice is ninety-two feet in length, by thirty in depth. The law authorizes the reception of all males under the age of twenty-one, and females not exceeding that of eighteen. Two hundred and seventy-nine persons can be lodged. The present amount of the annual expenses is about 12,000 dollars.

There are, at present, thirteen banking institutions within the city and the incorporated districts. The banking houses of the United States' bank, and the bank of Pennsylvania, are fine specimens of classical architecture. The walls are composed entirely of white marble. The state-house, on the south side of Chestnut street, between Fifth and Sixth streets, will remain a feature of interest as long as it lasts, as the spot where the declaration of independence was first promulgated. There are three theatres, which do credit to the city and the architects. The city library owes its origin to the public spirit of Franklin. It was commenced as early as 1731, and incorporated in 1742. In 1790, the present neat and ornamental edifice was erected on the east side of Fifth street, opposite to the state-house square, and over the front door is placed a marble statue of its founder, executed in Italy, and presented by William Bingham, Esq. The number of books, at present, is about 24,000, exclusive of the Loganian collection, which is about 11,000 volumes. Opposite this library is the Athenæum, a valuable institution, established in 1814. The library consists of about 5300 volumes, mostly books of practical utility and the current and popular literature. In the reading-room are regularly received more than seventy newspapers of the United States, besides English and French, and, occasionally, papers from other parts of the world. There are various other public libraries, the most valuable of which is that belonging to the academy of natural sciences, containing about 5000 volumes, and the philosophical society, whose collection is about 6000 volumes. Peale's museum, the most extensive collection of objects of natural history in America, occupies handsome apartments, built expressly for its accommodation, in the Arcade. The academy of fine arts was founded in the year 1805. It was originally intended for works of statuary, but the walls are now hung with fine pictures, some of them by masters of the highest celebrity. The university of Pennsylvania is distinguished by the celebrity of the medical school attached to it. The new halls were built in 1830: they are spacious, and in a handsome style of architecture. The medical class varies from 400 to 500 annually. The hall of the Jefferson medical college is also a spacious building. There are three prisons, one in Walnut street, a second in Arch street, and the Eastern penitentiary, which occupies about ten acres of ground. This is the only edifice in America calculated to convey an idea of the external appearance of the castles of the middle ages, which contribute so eminently to embellish the scenery of Europe. The United States' mint was established in 1791, and, by several successive acts of congress, has been continued at Philadelphia. In 1829, a new building for the mint was commenced in Chestnut street, near Broad street: it is a splendid building, faced with marble, and presents a front of 122 feet, divided into a portico sixty-two feet long, and two wings each of thirty feet. The building is of the Ionic order, taken from the celebrated Grecian temple on the river Ilissus, near Athens. The marine asylum stands on the eastern bank of the Schuylkill, a short distance south of the city line. It is 386 feet long, consisting of a portico of ninety feet, supported by eight Ionic columns, and two wings each 148 feet.

The greatest pride of Philadelphia is the magnificent works by which the city is supplied with pure and wholesome water. In 1797, a plan was adopted, which was to form a reservoir on the east bank of the Schuylkill, from which water was to be thrown, by a steam engine, into a tunnel, and thence carried to another engine-house, at the centre of the city, where it was to be again raised, by a second steam engine, into a reservoir, from which it was to be distributed, in pipes, through the city. By this means, in January, 1801, water from the Schuylkill was first thrown into the city. An experience of ten years proved that a sufficient supply could not be obtained by this method. The steam engines were liable to frequent failures from accident, and the derangement of one stopped the whole supply of the city. Accordingly, in 1811, a new reservoir was created, and two large engines constructed, which worked alternately, so that one was always ready, in case of accident to the other. It was soon found, however, that a supply of water, adequate to the demand, could not be obtained, although the annual expenses were enormous, and it was evident that some other power besides steam must be used for the purpose. In 1819, the project of damming the Schuylkill, and erecting the works at Fairmount, was commenced, the whole cost of which was, in 1824, 432,512 dollars, and the entire amount expended on the successive operations, 1,443,585 dollars. The consumption, in the summer months, is about 3,000,000 gallons for twenty-four hours, and the reservoirs will contain a supply for ten days, at that rate. The iron pipes, through which the water is conveyed to the city and districts, make, together, an extent of about thirty miles, and the sum annually paid for the use of the water is upwards of 60,000 dollars. The experience of years has shown that the power is sufficient to raise many times as much water as the city can possibly require for its consumption, and, consequently, that there is a surplus power applicable to other purposes. The provision against destruction by fire, in Philadelphia, is excellent. There are twenty-eight engine companies, and sixteen hose companies, and the sum of 5000 dollars, appropriated by the city councils, is usually distributed among these companies annually. There are two bridges across the Schuylkill, one within the city bounds, and another a few hundred yards north of the north line. They are beautiful and substantial structures. The whole length of that on Market street, including abutments and wing walls, is 1300 feet, of which the wooden platform, between the abutments, is in length 550 feet. The total cost of this bridge was 235,000 dollars, besides which the company paid 40,000 dollars for the purchase of the site. The Fairmount bridge consists of a single arch, of 340 feet, four inches' span, resting on abutments of stone. This bridge was erected in 1813, and the total cost was 150,000 dollars.

The public markets constitute a prominent feature. That along the High street is nearly two-thirds of a mile in extent. There are two shot-towers within the city, one of which was the first erected in the United States. The harbour of Philadelphia, from the peculiar features of the Delaware river, is more liable to be impeded by ice than that of New York or Baltimore; but, independent of that circumstance, it possesses, perhaps, as many natural advantages as either of the others. The Delaware is not navigable to this city for ships of the line of the first class. The arrivals at the port of Philadelphia, in 1829, were 374 vessels from foreign ports, and 2210 coastwise; in 1830, 415 foreign, and 3287 coastwise; in 1831, 396 foreign, and 3206 coastwise. The aggregate tonnage of the shipping of Philadelphia, on the 31st of December, 1828, was (permanent and temporary) 104,080 tons. The vessels built in 1829 amounted to 3524 tons; in 1830, to 2590, and, in 1831, to 3525 tons. The inspection of wheat flour, in 1830, was 473,876 barrels. By the will of the late Stephen Girard, Philadelphia has received a munificent donation, amounting to several million dollars, devoted to important public objects.

PHILADELPHISTS. See the end of the article *Boehme*.

PHILÆ, or JEZIRET EL BIRBA (i. e. Temple island); a small island of the Nile, on the borders of Nubia and Egypt; lat. 24° 1'; five miles south of Essouan or Syene. It contains the remains of some remarkable monuments of the ancient Egyptians, among which are four temples, an avenue of majestic columns, several obelisks, a monolithic temple, &c. The whole island is, in fact, covered with temples, in the largest groups, and in the highest state of preservation of any in Egypt. See the great French work, *Description de l'Egypte*, *Antiquités* i.; or Burkhardt's *Nubia*.

PHILANTHROPINISM. See *Schools*.

PHILEMON and BAUCIS; a pair celebrated in ancient Greece for their faithful affection even in advanced age. Fable (Ovid's *Metam.* viii.) relates the following story concerning them. Jupiter and Mercury, travelling through Phrygia, in a human form, found no one willing to entertain them except this aged couple, who received them hospitably, washed their feet, set before them a rustic meal, and prepared a couch for their repose. The deities then took their hosts to a neighbouring mountain, and when they looked behind them, they saw their village sunk beneath the waves; but the cottage in which they had welcomed the pilgrims, had become a magnificent temple. Jupiter promised also to fulfil all their wishes; but they only asked that they might die together as servants in that temple. At length, at a very advanced age, as they sat at the temple door, they were at once transformed, Philemon into an oak, and Baucis into a linden. They were conscious of their change, which came gradually upon them, and while they were able to see and speak, they took the most affectionate leave of each other. The trees were considered sacred, and long remained before the temple.

PHILEMON OF ATHENS, a Greek poet, contemporary with Menander, to whom only he was considered as second in dramatic composition. A few fragments of his writings have come down to us, which were originally collected by Hugo Grotius. Cumberland has printed an English translation. The time of his birth has been assigned to B. C. 373; and he is said to have died through excessive laughter at seeing an ass eat figs from a countryman's basket, B. C. 274.

PHILIDOR, ANDREW, a musician of Dreux, of some reputation in his profession, but far more celebrated as the best chess-player of his age, was born in France, in 1726, and became a page in the band of the king, where he made so great a proficiency, that he composed a successful mottet, with full choruses, before his twelfth year. As he grew up, his fondness for the game of chess increased into a passion, in order to indulge which, he travelled over great part of Europe, engaging every where with the best players. He continued in England some time, during which he printed his Analysis of Chess—a book which has since gone through numerous editions, and is considered a standard work. On his return to France, he devoted his attention to the comic opera, of which, with Monsigny and Duni, he may be considered the reviver. There are twenty-one operatic pieces of his composition, of which *Le Maréchal*, produced in 1761, ran more than a hundred nights. Philidor afterwards returned to England, and, in 1779, set the *Carmen Seculare*, esteemed the best of his works. His death took place in 1795, in London, where he was very generally esteemed for his integrity and suavity of manners. A short time previous to his decease, he played two games of chess at the same time, blindfold, against two of the most distinguished amateurs, one of which he won; the other was a drawn game.

PHILIP, king of Macedon, father of Alexander the Great, flourished in the middle of the fourth century before the Christian era. He went to Thebes as a hostage, when he was very young, and received an excellent education in the house of the celebrated Epaminondas. At the age of twenty-two, B. C. 361, he ascended the throne of Macedonia, which he found tottering and surrounded by numerous enemies. His genius soon succeeded in establishing it, and raising it to a pitch of greatness which it had never before attained. He freed himself from his enemies, partly by concessions, and partly by force of arms. In a short time, he made war also upon his peaceful neighbours; and, encouraged by his successes in Thessaly and Thrace, he sought gradually to extend his dominion over all Greece. The dissensions of the different states favoured his designs. The subtle Philip well knew what use to make of this division. When, therefore, he was summoned to aid the Thebans against the Phocians who had plundered the treasury of the temple at Delphi, he did not neglect this opportunity to carry into effect his ambitious purposes. The subjugation of the Phocians was very soon accomplished; but the treacherous conduct of Philip towards his allies opened the eyes of the Greeks; several states formed a league with the Athenians to oppose him, while others condescended to use the most disgraceful flattery towards the artful conqueror. A wound which he received on his return from a campaign against the Scythians, delayed the blow which was to prostrate the liberty of Greece, till, at last, the great victory at Cheronæa (B. C. 338) decided its fate. Philip assembled at Corinth the deputies of all the Grecian states, and dictated the terms of peace, which deprived them of freedom. When he was on the point of causing himself to be chosen commander-in-chief of the army which was to march against the

Persians, he was assassinated, in the forty-seventh year of his age, by Pausanias, a young Macedonian, who was hired to commit this act by the Persians. This prince, the inventor of the Macedonian phalanx united, with the highest talents of a commander, the intrepidity of the bravest soldier. But ambition and love of power were the most prominent features in his character, which often led him to the most unwarrantable actions.

PHILIP II., king of Spain, son of the emperor Charles V. and of Eleonora of Portugal, called, by the Spanish writers, the *Prudent*, and by the Protestants, the *Demon of the South*, was born at Valladolid, in 1527. Naturally cold, grave, and reserved, but sagacious and active, he was educated with care by Spanish ecclesiastics, by whom he was early imbued with bigoted sentiments. At the age of sixteen years, he married the Portuguese princess Mary, and was intrusted by his father with the administration of Spain, under the direction, however, of the duke of Alva. In 1547, Charles sent for him to come to Brussels, and Philip was received with every demonstration of joy by the Netherlandish estates; but his austerity and his preference of his Spanish courtiers soon rendered him an object of dislike. His father was desirous of having him declared his successor on the imperial throne, by the diet assembled at Ratisbon, in 1550, but his cold and proud manners were so unfavourable to his cause, that he was sent back to Spain. Having lost his first wife, Philip soon after married Mary I. of England (1554), who was much older than himself (see *Mary*); but his unpopularity among the English rendered his residence there so disagreeable, that he soon left the country and retired to Flanders. In 1555, Charles V. abdicated his crown in favour of his son, who thus became the first sovereign of Europe. Veteran troops, able generals and statesmen, a yearly revenue of 30,000,000 ducats, rich colonies and industrious provinces had raised Spain to an unexampled degree of power. Philip received from his father, in the presence of the states-general, and with the most impressive solemnities, the sovereignty of the Low Countries, and, a few weeks afterwards, assumed that of Spain. Charles retired to a monastery, on a moderate allowance, which, through the neglect of his son, was irregularly transmitted to him. In 1556, Philip concluded a truce with France, which was broken by the French, at the instigation of pope Paul IV., the same year. Paul having declared that Philip had forfeited the kingdom of Naples, a fief of the holy see, the latter found himself obliged to send the duke of Alva against the head of the church, who was forced to accede to an armistice. Philip then went to England, and prevailed on Mary, by the threat that he would otherwise never again set foot in her dominions, to declare war against France. A considerable English force, accordingly, joined the army under Philibert, duke of Savoy, and the count of Egmont, which was besieging St Quentin. The French, under Montmorency, were entirely defeated, August 10, 1557. Philip, who, during the battle, was occupied in prayer, joined the army after it was over. (See *Escurial*.) Instead of taking advantage of this victory to march to Paris, Philip was satisfied with occupying St Quentin, Ham, and Chatelet, and soon after, under the impulse of superstitious fears, concluded a disadvantageous peace with the pope. On the death of Mary (1558), which was hastened by the neglect of her husband and the loss of Calais, Philip sued for the hand of Elizabeth, who was too well acquainted with his temper and the aversion of her subjects against him, to listen to his addresses. The peace of Cambray (1559), finally terminated the long struggle of the French and Spanish monarchies, under conditions favourable to the latter. The marriage of Philip with the daughter of Henry II., king of France, who had been previously designed for don Charles, son of Philip, was stipulated by one of the articles of this peace. In the course of the year, Philip returned to Spain, leaving the government of the Low Countries in the hands of his natural sister, Margaret, duchess of Parma. His arrival was celebrated by the inquisition, with an *auto da fé*, and his reverential conduct during the burning of his subjects is highly praised by the Spanish writers.

Soon after this, the troubles in the Low Countries broke out. (See *Netherlands*, and *Granvella*.) Philip established the inquisition there for the suppression of heresy, and refused to mitigate its rigours, declaring that it was better to be without subjects than to be the ruler of heretics. The blood-thirsty Alva was sent (1567) to execute the cruel policy of the Spanish court. The counts of Egmont and Hoorn, with a great number of less distinguished sufferers, perished on the scaffold. Philip remained a cold and unmoved spectator of the horrors caused by his own rigorous policy. At the same period, a tragic event in his family tended to strengthen the gloom of his character. His son, don Carlos, died in prison (1568), where he had been thrown on a charge of treason, and two months after, died Elizabeth, the beautiful and virtuous wife of Philip. The beautiful Anna de Mendoza, the wife of his favourite and minister Ruy Gomez de Silva, was at this time his mistress. An insurrection of the Moors in Granada was quelled in 1570, and Philip married the archduchess Anne of Austria, his fourth wife. In the following year, his fleet assisted at the battle of Lepanto, gained by don John of Austria over the Turks. The duke of Alva was recalled from the Netherlands in 1573. His successor, Requesens, died in 1576, and was followed by don John of Austria, who was empowered to make some concessions; but, soon after his death (1578), the union of Utrecht was formed (January 23, 1579). The Belgic Netherlands, however, were reduced by the prince, Alexander Farnese, who next commanded the Spanish forces in that quarter. The throne of Portugal, having become vacant by the death of Sebastian, was claimed by Philip, who sent the duke of Alva to take possession of that kingdom. Philip himself soon followed him thither (1581), and received the homage of the Portuguese estates. The assassination of William, prince of Orange, in 1584, was received with the most indecent expressions of joy at the Spanish court, but William's son, Maurice, was a still more formidable enemy. A rupture with England (see *Elizabeth*) soon followed, and the Armada was fitted out for the conquest of that kingdom. (See *Armada*.) When the duke of Medina Sidonia, who had the command of the expedition, appeared before Philip with the information of its destruction, the king thanked him, because he had not despaired of his country. "The will of God be done," he added, coldly; "I sent my ships to fight with the English, not with the elements." This event was a death-blow to the Spanish monarchy. Philip sent assistance to the leaguers in France (see *League*), and commanded the duke of Parma to invade the kingdom. Even after Henry IV.'s conversion to the Catholic faith, he continued his hostility to that prince, who, in consequence, declared war against him. The war with England was meanwhile continued, and Spain not only suffered much by losses in her American colonies, but was compelled to witness the capture of Cadiz, and the destruction of the shipping in that port by Howard and the earl of Essex. (See *Devereux*.) Prince Maurice of Nassau had also gained the ascendency in the Low

Countries, and seven of the provinces had declared themselves independent.

Reverses and disease, at length, broke Philip's spirit; he became desirous of restoring tranquillity to his dominions, and concluded the treaty of Vervins with France. He died the next year, September 13, 1598. The gout, dropsy, and a violent fever, had afflicted him the two last years of his life; but he retained his senses and his activity to the last. Sores on his breast and knees, the consequence of his early debaucheries, disturbed his last days, and from their corrupt matter issued swarms of lice, which the physicians were unable to destroy. He bore his sufferings with great firmness, and punctiliously observed all the rites of the Catholic church. Philip was a prince of considerable capacity, and he entered with facility into the details of affairs. His pomp, generosity, activity, and just administration, when it did not interfere with his own private plans, made a strong impression on the minds of men; but his boundless ambition, his severity, and his gloomy superstition, made his reign a period of war and of bad passions, and exhausted the immense resources of his empire. Among his instruments was poison, which he familiarly called his *requiescat in pace* (rest in peace.) With his reign began the decline of the Spanish monarchy. His Life by Campana is a panegyric on his character. Different views will be found in the History of the Reign of Philip II., by Watson, and in Dumesnil's *Histoire de Philippe II.* (1 vol., 8vo, Paris, 1822.)

PHILIP III., IV., and V., of Spain. See *Spain.*

PHILIP II., Augustus, king of France, born 1165, ascended the throne on the death of his father, Louis VII., 1180. One of his first measures was the banishment of the Jews from the kingdom, and the confiscation of their property. This was done under pretence of their being guilty of various crimes; but the real purpose of the measure was to get possession of their wealth. Philip next endeavoured to repress the tyranny and rapacity of the nobles, which he effected partly by art, and partly by force. In 1190, he embarked at Genoa on a crusade to the Holy Land, where he met Richard Cœur de Lion (see *Richard I.*,) who was engaged in the same cause in Sicily. (See *Crusades.*) The jealousies and disputes which divided the two kings induced Philip to return home the next year; and he took advantage of Richard's imprisonment in Austria, to seize some of the English fiefs in Normandy. (See *John.*) This enterprise was in direct violation of the oath by which the two princes had mutually bound themselves to attempt nothing against each other's dominions during the continuance of the crusade; and, on Richard's delivery, he commenced a war against Philip, which continued till the death of the former in 1199. Philip, on his return from the Holy Land, had married Ingelburga, sister of the king of Denmark; but, having taken some disgust at her, he finally procured from his bishops a divorce, under pretence of consanguinity, and married Agnes, daughter of the duke of Meran. On the complaint of the king of Denmark, the pope declared this marriage null; and, on Philip's refusing to receive Ingelburga, pronounced the interdict against France.* The king was therefore obliged to yield, and restore her the honours of a wife and queen. (See *Innocent III.*) In his subsequent wars with John (of which an account is given in the article *John*), Philip conquered all Normandy, Touraine, Anjou, and Maine, so that, of all the British possessions in France, Guienne alone remained. Philip also took part in the crusade against the Albigenses (q. v.), and died in 1223, after a reign of forty-three years. This prince was an able general and sovereign: he extended the boundaries of the kingdom, and first raised the royal authority from its dependence on the great vassals. He improved the military organization of his realm, founded useful institutions, constructed roads, and favoured learning. See *France.*

PHILIP IV., V., and VI., of France. See *France.*

PHILIP THE BOLD. See *Burgundians.*

PHILIP THE GOOD. See *Burgundians.*

PHILIP, King, sachem of Pokanoket, was the youngest son of Massasoit, and succeeded his brother, Alexander, in 1657. In 1662, he renewed the friendship which had subsisted with the British, and engaged not to dispose of any lands without their knowledge or appointment. In 1675, however, he commenced a desolating war, in order to arrest the progress of the whites, foreseeing, as he did, the loss of his territory, and the extinction of his tribe, in the increase of their settlements. After prosecuting hostilities with great energy and heroism, and inflicting considerable mischief, he was killed in a swamp, August 12, 1676, when endeavouring to escape from captain Church.

PHILIPPI; a town on the borders of Thrace and Macedonia, where two battles were fought (B. C. 42) between the republicans under Brutus and Cassius, and the friends of Antony and Octavius, in which the former were defeated. (See *Antonius* and *Brutus.*) The Epistle of Paul to the Philippians was written to the church which that apostle founded at Philippi.

PHILIPPICS; the orations of Demosthenes against Philip, king of Macedon. (See *Demosthenes.*) Cicero applied this name to his invectives against Antony, and it has hence come to signify an invective in general.

PHILIPPINES; a group of islands in the Pacific ocean, 1200 in number (lat. 4° 22′ N., lon. 116°—128° E.), extending about 450 leagues from north to south, and about 280 in its greatest breadth. The principal islands are Luçon (q. v.), Mindanao (q. v.), Palaouan, Mindoro, &c. The capital of the Spanish possessions is Manilla. (q. v.) The population of the group is estimated at about two and a half millions, of whom 7000 are Chinese, 4000 whites (Spaniards), 118,000 mestizos, and the rest natives. Of the latter there are two distinct races, the Papuas, or negroes, who live principally in the interior, and seem to have been the primitive inhabitants, and the Malays, who dwell nearer the coasts. (See *Malays.*) The Philippines were discovered, in 1521, by Magellan, and received their present name in honour of Philip II., king of Spain. The first settlements were made by the Spaniards in 1570. In 1823, the creoles and mestizos made an attempt to obtain a liberal government, but the insurrection was put down by the Spaniards, who employed in this service a force formed of the converted natives. The face of the country is mountainous, and there are numerous volcanoes in the different islands, whose eruptions have repeatedly caused great ravages. The climate is various, but the heat is never excessive. Violent rains, hurricanes, and earthquakes, often do much mischief. The soil is not less various, but, in general, is fertile. Rice, coffee, sugar, cocoas, tobacco, indigo, and a great variety of pulse, with many sorts of tropical fruits, ebony, sandal wood, dye woods, &c., are among the vegetable productions. Gold, silver, and sulphur, are among the minerals. The domestic animals of Europe thrive here. The trade of these islands is principally with the Chinese and British.—See Aragon's *Description de la Isla de Luzon* (Manilla, 1820).

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* Agnes de Méran died of grief, at Poissy, in 1201, the year in which she was repudiated. The pope legitimated her two children by Philip, as she was authorized to consider the king free when she married him.

PHILIPPONES; a Russian sect, a branch of the Roskolnicians, so called from their founder, Philip Pustoswiat. The sect took its rise in the northern part of Russia, towards the end of the seventeenth century, and neither acknowledges the pope, nor esteems consecration by the Russian church as valid. They differed from the other Roskolnicians chiefly in having no ordained clergy. Communion, confirmation, absolution, and marriage, by ecclesiastics, were not, therefore, practised among them. (See *Greek Church*, and *Roskolnicians*.) In each of their societies is an elder (*starik*,) chosen by themselves or by his predecessor, who can read Sclavonic, and is obliged, after his baptism, to abstain from strong drinks. He performs the different clerical offices. Absolution, they consider, must be received immediately from God. They scruple to take an oath, or to perform military service. Many Philippones fled, in the beginning of the eighteenth century, into Polish Lithuania, whence some of them passed into the Prussian territories.

PHILIPS, Ambrose, a poet and dramatic writer, was a native of Leicestershire, and studied at Cambridge. On quitting the university he went to London, and became one of the literary wits who frequented Button's coffee-house, and a friend of Steel and Addison. The publication of his Pastorals involved him in a war with Pope, who ridiculed them in the Guardian; in consequence of which Philips threatened to inflict personal correction on the satirist. He was one of the writers of a periodical paper, called the Freethinker; and doctor Boulton, the conductor, obtaining preferment in Ireland, Philips was made registrar of the prerogative court at Dublin. He returned to England in 1748, and died the next year. He was the author of the Distrest Mother, a tragedy (1712), taken from Racine; the Briton (1722,) and Humphrey, duke of Gloucester (1723); and he wrote the Life of Archbishop Williams. See Johnson's *Lives of the Poets*.

PHILIPS, John, an English poet, born in Oxfordshire, 1676, was educated at Christchurch, Oxford, where he produced the Splendid Shilling, in which the sonorous cadence of the blank verse of Milton is adapted to familiar and ludicrous topics. He also wrote Blenheim, a poem, in celebration of the duke of Marlborough's victory; but his principal work is Cyder, a Georgical work, in imitation of Virgil. He died in 1708. See Johnson's *Lives of the Poets*.

PHILISTINES; apparently an Egyptian tribe, from whom Palestine, before called *Canaan*, received its name. They dwelt in the southern plains of that country along the coasts of the Mediterranean. They were constantly at war with the Israelites, whom they reduced to subjection at one period after the death of Joshua. In the German universities, the students give the name of *Philistines* to persons not members of the universities.

PHILO; a learned Jewish author, who flourished in the first century of the Christian era, in the reign of the emperor Caligula. He was born some years before Christ, in Alexandria, where he was educated, and distinguished himself by his proficiency in eloquence, philosophy, and a knowledge of the sacred writings. With the writings of Plato, whose philosophy was at that time in the highest repute in Alexandria, he made himself intimately acquainted, and he adopted his doctrines so completely, that it was said of him, *Philo platonizes*. From the time of the Ptolemies the Jews had borrowed the use of allegories from their Egyptian neighbours, and thus imbibed Platonic and Pythagorean doctrines, which they treated as the hidden and symbolical sense of their own law. Thus, without having the appearance of being indebted to the heathen philosophers, they could make an arbitrary use of their systems. These systems were likewise mixed with various Oriental theories, in particular respecting the nature of God. Philo zealously studied this philosophy, then so popular in Alexandria; and either because he did not sufficiently understand the Jewish doctrines, or because he was not satisfied with the literal sense of the Mosaic law, he mingled Platonic dogmas with the holy scriptures, and ascribed them to Moses. Probably he followed the example of the Essenes and Therapeutæ, of whom he always spoke with great esteem, though he did not adopt their mode of life. He considered God and matter as co-eternal principles; God as the primitive light, from whose rays all finite intelligences proceed. The understanding or wisdom of God (λογος), he called also the Son of God, his image, according to which God, by his creative power, produced the material world. He founds our knowledge of God upon intuition. On account of these doctrines, Bouterwek considers him as one of the first Alexandrian New Platonists. Philo perfected himself also in eloquence, and acquired a knowledge of public affairs, in which his fame was so great that he was sent by his countrymen, in the year 42, at the head of an embassy to Rome, to defend the Jews against the calumnious accusations of Apion and others. Caligula would not admit the embassy into his presence, and Philo was even in danger of losing his life. He composed, in consequence, a written justification of the Jews, evincing great learning and skill. The accounts are unworthy of belief, which state that Philo went afterwards to Rome under Claudius, that he became there the friend of the apostle Peter, and embraced the Christian faith, but renounced it again on account of some mortifications which he met with. Those writings of Philo, which have come down to us, are published in the last and most complete edition by Manzey (London, 1742, 2 vols., folio); after him, by Pfeiffer (Erlangen, 1785 and the following years, 5 vols.). They show that Philo was a man of great learning and industry, who was well acquainted with Greek philosophy and literature, and are very useful for those who would learn the state of philosophy at that time in Alexandria.

PHILO OF BIBLOS; a grammarian, who lived under Nero and the following emperors till the time of Adrian. He translated Sanchoniathon's Phœnician History into Greek, of which we still possess some fragments.

PHILO OF BYZANTIUM, who lived in the second and third centuries, is mentioned as the author of a work on military engines, on the Seven Wonders of the World, &c. Besides these, there are an academic and a stoic philosopher of this name.

PHILOCTETES; a Grecian hero, son of Pœan and Demonassa, celebrated for his skill in archery. He led the warriors of Methone, Thaumacia, Melibœa, and Olizon in the expedition against Troy; but, having been bitten in his foot, while he was offering sacrifice in the island of Chrysa, by a serpent which guarded the temple, he became, by the mortification of his wound, so offensive that he was sent back to Lemnos, and there dragged out nine miserable years in lamentations. But, according to the prophecy of Helenus, Troy could not be taken without the arrows of Hercules, and these were in possession of Philoctetes, to whom the hero had given them, when he ascended his funeral pile. It therefore became necessary for the Grecians before Troy to recall Philoctetes. Ulysses, who had advised his exile, with Pyrrhus (according to some, Diomedes) undertook the embassy; the latter, by promising to heal his wound, prevailed upon him to return to Troy. He was cured by Machaon (or Æsculapius), and after many Trojans, among whom was Paris, had fallen by his arrows, the city was taken. The history of Philoctetes forms the subject of one of the tragedies of Sophocles.

PHILOLOGY.* This word, among the ancients, had a signification which included what we now call philosophy, literature, the sciences, and the theory of arts, though it excluded their practice. Thus poetry and rhetoric, considered as sciences, came within the description of *philology;* but philologists were not expected to be orators or poets. Cicero calls his philosophical works φιλολογωτερα, as opposed to his orations; the former being written in a didactic or argumentative, the latter in a more elegant or artificial style. (*Ad Att.*, xiii. 12.) We are informed by Suetonius (*De illustr. Gram.*, c. 10) that Eratosthenes of Cyrene was the first among the Greeks who assumed the name of φιλόλογοι. He was a man of unbounded erudition, a physician, philosopher, geographer, grammarian, historian and poet, though we are told that he excelled in none of these branches. (*Moreri.*) Before his time, a philologer or philologist—for both words are used in the English language—was called γραμματικὸς, which did not mean a *grammarian* in the present acceptation of the word, but a *man of letters;* in which sense literary men were first called at Rome *literati*, and afterwards, when Greek terminology became fashionable, *grammatici* and *philologi*. Philology, then, included in ancient times, with few exceptions, every thing that could be learned (*omne scibile*). In those days, however, science was circumscribed within much narrower bounds than it is at present. The numerous branches which compose what is now called *natural science*, were very imperfectly known. The same may be said of geography, astronomy and natural philosophy. All that was known of those sciences, with grammar, rhetoric, scholastic logic, metaphysics and elementary mathematics, formed an aggregate which obtained the name of *philology*, until long after the destruction of the Roman empire; and that is the sense in which this word is understood in many, if not most of the colleges and universities of Europe, always with reference to ancient, and not to modern learning; hence *criticism*, as applied to the Greek and Roman writers, and the knowledge of ancient coins and medals, and other recondite antiquities, are considered as important branches of philology, and those which chiefly entitle their followers to the name of *philologists*. This opinion was general as late as the seventeenth century. At that time the Bentleys, the Scaligers, the Saumaises, were the philologists *par excellence*. The dictionary of the French academy defines philology *erudition qui embrasse diverses parties des belles-lettres, et principalement la critique*. A century afterwards Johnson defined it *criticism, grammatical learning*. But of late, the word *philology* has received a more definite and more appropriate meaning; and it seems now, by a tacit, but almost universal consent, to be chiefly, if not exclusively, appropriated to that science which embraces human language in its widest extent, analyzes and compares its component parts and its various structures in thousands of idioms and dialects, that are and have been spoken on the face of the habitable globe, and from the whole seeks to draw inferences that may lead to a clearer and more extensive knowledge than we have hitherto possessed of the history of our species, and particularly of the migrations of different nations, their connexion and intercourse with each other; for language, though perishable, like all other earthly things, is still the most lasting monument of events long since past, and the surest means of transmitting facts through successive generations. When the sounds of a language have ceased to reverberate, and no longer convey ideas through the human ear, that language still lives in written characters, which speak to the mind through the eyes, and even when the sense or meaning of those characters is lost or forgotten, genius, aided by philology, will, after many ages, revive, at least some fragments, and Champollions will arise, whose labours will perhaps succeed in recovering an ancient language, long considered as not only dead, but profoundly buried in the night of time. A science like this, so wide in its extent, and yet so homogeneous in all its parts, requires an appropriate name, a name familiar to men of science, and such as the learned world will easily be led to adopt. Various denominations have been attempted to be given to it, such as *glossography*, *glossology*, and others of the like kind; but those names have been uniformly rejected. "Philology," says Webster, "is that branch of literature which comprehends a knowledge of the etymology or origin and combination of words, and whatever relates to the history and present state of languages. It sometimes includes rhetoric, poetry, history, and antiquities." Indeed, the word *philology* has been gradually falling off from its original acceptation, as no longer requisite for the heterogeneous mass of sciences to which it was formerly applied. Literature, criticism, archæology, philosophy, history, grammar, rhetoric, logic, metaphysics, and all else which once came under this sweeping denomination, have all received specific and appropriate names, and each of them is now too vast and too extensive, and many of them too distant from each other, to allow of their being classed under one general appellation. The word *philology*, therefore, had become as it were in *abeyance*, and the science of human language, comprehending all its various divisions and subdivisions, has very properly taken hold of it, and appropriated it to itself with universal consent. Under this impression, we have headed this article *Philology*, and under it, we shall endeavour to give a general idea of the science which it denominates.

The science of languages, in its present extent, is of very late date. The ancients (we mean the Greeks and Romans) had, indeed, analyzed, with great judgment, their respective idioms, and reduced them to grammatical systems truly worthy of admiration; but beyond that they did not go. They called every language but their own *barbarous*, and did not think any other worthy of attention. We have learned nothing from them of the Punic, nor of the ancient Persian, though they were so long at war with the nations that spoke those idioms. Their excessive pride has suffered those idioms to perish, though there is reason to believe that they were both rich in literature of their own. Even of the language of Egypt, where they so long governed, the Romans have told us nothing, and the Greeks very little. How interesting would be, at this day, a Coptic grammar, written by a Roman or Greek grammarian, with some explanation, at least, of their hieroglyphic characters, more satisfactory than what we have received from Herodotus and Clement of Alexandria! An incomplete translation of the works of Horus Apollo is all that we have, and it has rather increased than dispelled our ignorance of the system of that ancient mode of writing. It led us into a false tract, in which we continued until Champollion showed us another and a better way. This prejudice continued until a very late period. Even in the days of Dante, Petrarch, and Macchiavelli, and later still, in those of Ariosto and Tasso, the beautiful Italian language was styled, in opposition to the Latin, *la lingua volgare;* that is to say, the *lingua rustica*, the *patois*, the jargon, the dialect of the *vulgar*. The same contempt followed the other modern idioms. It was taught in the colleges that there were but four *mother tongues*, the Latin, the Greek, the Hebrew, and the Syriac (the two last were added by the theologians on account of their supposed sacred origin). All other languages were mere dialects. Such was the ignorance that prevailed on the subject of languages. In the seventeenth century, the cloud began to be dispelled, but gradually indeed. A great step was made by Messieurs de Port Royal, who, in 1660, published their *Grammaire générale et raisonnée*, the work of Arnaud and Lancelot, two of their members. Here the first attempt was made to generalise the grammatical science, and to deduce from it principles and rules applicable to all languages. That work was much and justly admired when it appeared, and has been the model of almost all that have been published since on the same subject. But the foundation was wanting for such a work at that time. The knowledge of languages was yet confined to a few. The Greek, the Latin, the Hebrew, with the French and Italian, and, perhaps, the Spanish, were the most that a philologist aspired to know. One cannot refrain from smiling, when he sees Messieurs de Port Royal, after stating a principle or rule common to the languages that they knew, gravely asserting that that principle governs in every language (*dans toutes les langues*). This assertion is frequently met with in the General Grammar, and may at this day be as often easily disproved. The variety of forms existing in languages was not even suspected. The missionaries had not yet made known the extraordinary structure of the Chinese on the one hand, and of the American idioms on the other; what little was known of them might produce a momentary wonder, but did not excite the curiosity of grammarians and philologists. It was not until about the middle of the eighteenth century that a broad and comprehensive view of the various languages, of men began to be taken by the learned. M. Maupertius, who did not deserve all the ridicule which the jealousy of Voltaire endeavoured to throw upon him, published an essay on the Origin of Language, in which he recommended studying the idioms even of savage and barbarous nations, "because," said he, "there may be found among them some that are formed on *new plans of ideas*." So little was the world prepared for this view of the subject, that M. Turgot, a man, certainly, of great sense and judgment, who was afterwards minister to the unfortunate Louis XVI., in a similar essay that he published, thought proper to sneer at this expression, saying that he could not understand what was meant by *plans of ideas*. The science was then in its infancy. Languages were considered only in respect to the etymology of their words and their affinity with each other. For more than three centuries, attempts have been made from time to time to collect materials for the comparison of languages. These consisted of vocabularies, and of the Lord's prayer printed in various idioms, but all on a very limited scale. Adelung has given us a list of those works at the end of the first volume of the *Mithridates*, beginning with Johann Schildberger, who, about the year 1427, at the end of a book of travels, published the *Pater Noster* in the Armenian and Tartar languages. In all these the science was considered as confined to the knowledge and comparison of words; the importance of the grammatical forms and internal structure of the various idioms might have struck some privileged mind, as it did that of M. Maupertuis, but it was far from being understood by the grammarians and philologists of that day.

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* This article comes from the same learned source with that on *Language*, and forms a whole with it. The interest of the subject, and the originality of the author's views, are the reason of the space allowed it.

The science did not begin to extend its bounds until the latter half of the last century. Hervas, in 1784, published at Cesena, in the Roman states, his catalogue of known languages (*Catalogo delle Lingue conosciute, e Notizia delle loro Affinità e Diversità*), and afterwards his polyglot vocabulary of 150 languages, and a collection of the Lord's prayer in more than 300. But, while he was engaged in the composition of these works, Catharine the Second, empress of Russia, was meditating another, on a plan much more extensive, which was no less than a comparative vocabulary of all the languages in the world. This noble idea she not only conceived, but actually carried into execution, with the aid of professor Pallas, for the languages of Asia and Europe, and of Mr Theodore Jankiewitsch, for those of Africa and America. Then, and not till then, philology began to be a science. Still etymology alone was the only object which that great work had in view. The various structure of languages had not yet attracted the attention of the learned. In the celebrated French *Encyclopédie*, under the word *Langue*, languages, in this respect, are divided only into two classes, those which admit of inversions, like the Latin and Greek, and in some measure the German, and those which do not, like the French, and some other modern European idioms. The monosyllabic Chinese, with its absence of forms, the polysyllabic and polysynthetic structure of the American Indian languages, were not at all taken into consideration in the classification of the various modes of human speech: indeed, that classification had not even been attempted, either in respect to etymological affinities, or to the grammatical construction and arrangement of words; or, if some efforts were made, they were so limited in their range, and on the whole so unsatisfactory, that they are undeserving of any attention at this day. To two illustrious Germans, John Christopher Adelung, and his able successor, John Severin Vater, is due the honour of having first presented the world with a scientific classification of all the known languages, and a correct description of each idiom, particularly with regard to its grammatical structure. This was done in their admirable work, the *Mithridates*, a work so well known to the learned, that it is unnecessary to mention more than its title. We may venture to call this book, without fear of being contradicted, the fountain of all philological knowledge; and we do not hesitate to say that it deserves to be placed among the greatest and happiest efforts of the human mind. A translation of it into the English or French language has been long desired, and it is astonishing that no one has been yet found to attempt it. M. Balbi lately published, at Paris, a valuable work, entitled *Atlas Ethnographique du Globe*, in which he gives a succinct view of the different languages, with the addition of the knowledge acquired since the publication of the *Mithridates*. But the form which he has adopted—that of a large folio atlas, with synoptic tables—has prevented him from executing as perfect a work as he might otherwise have done with the knowledge and talent which he possesses; and we are compelled to say that a translation of the *Mithridates* is still a desideratum in the philological science. Next to the *Mithridates*, we think Balbi's work the most useful book of its kind, on the subject, that has appeared within this century. It will afford considerable aid to those who apply themselves to the study of that science. We only regret that he did not follow the method of his predecessors, which we think infinitely better adapted to the subject.

The progress of philology since the publication of the empress Catharine's vocabulary and of the *Mithridates*, and particularly since the general pacification of 1814, is hardly to be conceived. We wish we could mention here all the valuable and important works that have appeared in the present century, in Russia, Germany, France, and elsewhere in Europe and in the United States of America, either on the general subject of languages, or on particular idioms till then little known, and some of which were even entirely unknown to the learned. The shortest notices that we could take of all those publications would fill more than the remainder of the space allotted to this article. It would give us infinite pleasure to expatiate on the labours of Adelung, Klaproth, the two Humboldts, De Sacy, Remusat, Jomard, St Martin, Pougens, Burnouf, Akerblad, Young, Colebrooke, Champollion, Heeren, Eichhorn, Stewart, Murray, Barton, Hodgson, Pickering, Webster, and so many others, whose names crowd so fast upon our pen, that we find ourselves obliged to stop, and proceed to another part of our subject.[*] From the aggregate of the labours of these men and their illustrious predecessors, has resulted the science which we call *philology*—a science as vast in its extent as interesting in its details. Like all other sciences, it requires to be subjected to some methodical order, in order that a comprehensive view may be taken of its whole extent, and a regular system pursued in the study of its component parts. We adopt, as the only attempt that has been made to give to philology a definite form, by delineating its constituent members, that we are acquainted with, the division which Mr Duponceau has made of it, into three principal parts, which he calls *phonology*, *etymology*, and *ideology*, and which he defines as follows:—

Phonology is the knowledge of the sounds produced by the human voice. It teaches us to distinguish those sounds, with their various tones, accents, and inflections; to analyze, class, and compare them with each other, and represent them as much as possible by visible signs. *Etymology* is the knowledge of those constituent parts of speech that we call *words*. By means of it we are enabled to trace the affinities of the different idioms of the earth, and the filiation of the numerous races and families of men who inhabit it; and, lastly, *ideology* is the comparative study of the grammatical forms and idiomatic structure of languages, by which we are taught to distinguish the different shapes in which ideas combine themselves, in order to fix perceptions in our minds, and transmit them to those of others. (See the Preface to the translation of Zeisberger's Grammar of the Leni-Lenape, or Delaware Language, in the Transactions of the American Philosophical Society, vol. iii., new series. p. 75.) Having adopted this division of our general subject, we shall, as briefly as possible, consider separately each of the three parts of which it is composed.

1. *Phonology*. This we have defined to be "the knowledge of the sounds produced by the human voice." According to this definition, it seems to include *music*, and it does, in fact, comprehend it; for music is a language, and the only one that may be called universal. It is true that its sphere is limited; still it conveys the impression of passions and feelings from mind to mind by means of audible sounds, and, coupled with the language of signs, which we call *pantomime*, there is hardly any thing that it cannot communicate. When we speak of the language of signs, we exclude those that are merely conventional, such as are taught to the deaf and dumb, or which they agree upon among themselves: we mean those alone proceeding from natural impulse, and which every one will understand without previous teaching. Music and pantomime, therefore, considered as means of communication between men, by awakening ideas, perceptions, and feelings, by means of audible sounds and visible signs, are parts of the general science of philology; and music, which speaks to the ear, comes properly within that division of it which we call *phonology*. The sounds of which music is composed have an immense advantage over all other sounds produced by the human voice. They are susceptible of being divided into parts, as minute and as nearly accurate as the ear can discriminate; so that their almost infinite combinations may, by a few conventional signs, be presented through the eye to the mental ear, in a uniform manner, from one end of the world to the other. And this is not all: the duration of each sound, and of the intervals of silence, are as accurately marked by those signs as the sounds themselves; so that the most complicated piece of music is sung or executed at St Petersburg in the same manner as it is at Canton or at London: as far as it extends, therefore, music may be called a *universal language*.

It has been frequently asked whether the *oratorical* sounds or tones could not be described by signs, in the same manner as those of music. Various attempts have been made to that effect, and Dr James Rush, of Philadelphia, has written a very learned and ingenious treatise on the subject. But all such attempts have failed, and, from the nature of the thing, must always fail. We shall endeavour to explain the reason of this opinion. The musical sounds or tones proceeding from the grave to the acute, and *vice versa*, form, as it were, an ascending and descending line, easily divisible into parts, which the ear can appreciate. This effect is produced by certain organs, which operate by pressure, letting out of the mouth of the singer a greater or lesser quantity of air, and striking the external air variously, according to the manner in which they act, which it would be difficult, and it is not necessary here to describe. Those organs, in speaking, are not called in the same manner into action; the tones of the speaker differ more from each other in strength than in acuteness or gravity; in short, speech is monotonous, when not modified by strong passion or feeling; and, in that case, it modulates within a very narrow compass, which is not susceptible of division, like the musical scale; and, indeed, the word *modulation* would be here improperly applied, for the rising and falling of the orator's voice, in speaking, is no more than what, in music, is called *expression*, and it is not more susceptible of notation in the one than in the other. The musician has his F. and FF., and P. and PP., for *forte*, *fortissimo*, and *piano*, *pianissimo*, and his marks > and <, to swell or diminish gradually the sound of a particular note: beyond that, he has no guide but his feeling and taste, and the instruction of a good master, aided by exercise and practice. This musicians call *method*. A man may read and write music in perfection, but, without method, he will not be a good singer; so one may read and write his language with perfect correctness; without method he will not be an orator: and that method cannot be learned from notes or written signs, but must be acquired by instruction, exercise, and practice, coupled with that natural disposition, without which there can be neither a musician nor an orator. But if the sounds, which are the elements of speech, are not divisible in the same manner as those from which music proceeds, they are, nevertheless, susceptible of discrimination from each other, and may be divided into classes, though not into intervals. A much greater number of organs concurs in their production than in that of the musical tones. The head, the breast, the lungs, the throat, the lips, the tongue, the palate, the teeth, and even the nose, all lend their aid to the formation of the wonderful mechanism of language. M. Court de Gebelin has described anatomically the manner in which the different sounds are produced, in his *Histoire naturelle de la Parole*, to which we refer our readers. In the analysis of these sounds, and in the means of representing them by visible signs, consists the principal part of the branch of science which we call *phonology*. This seems easy at first view, particularly when we consider the small number of elementary signs contained in our alphabets, which are, in general, sufficient for practical use in the languages to which they are applied, aud to which they belong; but, if we extend our prospect, and attempt to describe all the elementary sounds which the human organs may, and, in fact, do utter, for the purpose of oral communication in the different countries of the world, we find ourselves at once surrounded with difficulties. There is no common standard for the pronunciation of any given vowel or consonant. Their mode of utterance varies in different countries, so that it can hardly be recognised from one to the other. Take, for instance, the vowel *a*, not its acute sound in the English word *grace*, but what is commonly called the French and Italian *a*. The first thing that will strike an experienced phonologist is, that this sound does not at all exist in the English language. It is not the *a* in *call* that is too broad; not the *a* in *father* that is too acute, and it rather approximates to the French broad *e* in *tête*, as articulated in solemn discourse, and on the stage. If this should be still doubted, we will ask an Englishman to pronounce the French word *barbier*. He will at once give to the *a* the long and acute sound of *a* in the English word *barber*. It has been observed that the pronunciation of this letter *a* is the *Shibboleth* by which an Englishman is soonest detected in speaking the French language, and teachers will acknowledge that they find it most difficult to make their scholars pronounce it properly. As to consonants, similar difficulties exist. The English *th* (the delta and theta of the modern Greeks) is seldom correctly pronounced by those who have not these sounds in their native language. The English *sh* and the French *ch* have by no means the same sound. There are nations who confound the *b* and the *v*, the *b* and the *p*, the *d* and the *t*, and cannot discriminate the one from the other. The Mohawks pronounce the *k* so nearly like the sound of *g* hard, that it requires a very nice ear to distinguish which of the two it is. The Rev. Mr Williams, a native Mohawk of mixed blood, after much hesitation, at last determined in favour of *k*. Before that time, both letters had been indifferently used in their alphabet to represent it. It has long been a subject of controversy whether the ancient Greeks pronounced the β like our *b* or *v*. It seems most probable that it represented a sound partaking of both. The Spaniards use these two letters indifferently. The fact is, that the sounds uttered by the human voice, particularly the vowel sounds, slide into each other by imperceptible shades, which may be divided *ad infinitum*, and the number of their divisions is only limited by the power of the ear to discriminate them. Thus from *a* to *o* there are a great number of intermediate sounds. The monosyllable *ja*, pronounced by an elegant woman of Berlin or Dresden, has the small short sound of the French *a* in *păpă*: a Suabian peasant, on the contrary, will say *jō*, with the prolonged sound of our broadest *o*. It is probably from this analogy that the double *aa* in the Danish language has the sound of *o*; and the same sound is expressed in Swedish by *a*. Proceeding from the grave to the acute, the sound *a* falls into the French *è* open, then to the acute *a*, as in *grace*, *face*, and, becoming still more acute, it is heard as the English *ee*, or the French and Italian *i*. We have shown how the consonants are often confounded with each other. All this proceeds from the various motion, the greater or lesser aperture or pressure of the organs employed in speech, and, for want of a common standard, or, if we may so express ourselves, *diapason*, it is impossible to convey an idea of those differences in sounds, and their nice shades and gradations, otherwise than by a direct appeal to the ear. Nothing more can be obtained by a reference to sounds that are known than an imperfect approximation; whence it happens that the pronunciation of a foreign language, though ever so nearly connected with our own, can never be learned from books, and when, at a certain age, the organs of speech have lost that flexibility which they possess only in early youth, even the practical aid of a master is often found insufficient.

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[*] We cannot, however, refrain from referring to a series of articles which appeared in Leigh Hunt's London Journal, by Mr Egerton Webbe, on the subjects of language and philology, and which displayed much learning and profundity of thought.

When we pass from sounds that are known, that is, those to which our ears have become more or less accustomed, from their existing in languages which we have at least heard spoken, or from their bearing a great analogy to those of our idiom, and proceed to those which our ears have never heard, and which bear no analogy to those that we know, the difficulty of conveying those sounds to the mental ear by means of written signs, becomes insuperable. Such are the whistled *w* of the Delawares, the *c* of the Peruvians and Othomís, which the Hispano-American grammarians call *castannuelas*, which we cannot describe otherwise than by saying that it is something like our *k*, pronounced from the throat only, and imitating the noise of a monkey cracking nuts; the *yerwe* of the Russians (br), something like our sound *we*, pronounced very short, and struck by the preceding consonant in a manner which cannot be described; the Polish crossed *t*, the guttural sound said to be peculiar to the Hottentots. These and many others that could be mentioned, we have no means of making known, except through the medium of the physical ear. To those who never heard them, no written signs can convey a correct idea of their utterance. The degrees of the musical scale are conveyed from one country to another by means of instruments, violins, flutes, &c., from which an accurate idea of them may be every where obtained. If it were possible to invent a mechanism that should, in the same manner, convey to the ear the various sounds produced by the organs of speech, it would be an immense advantage to phonology. We believe that it would be possible to effect it, if phonology possessed the same attraction as music; but the Vaucansons of the age will hardly undertake it for this dry science. It appears impossible to us, at least at present, to make a complete and accurate general alphabet of all the sounds existing in the different languages of the earth: all we can expect to arrive at is some kind of approximation, by means of which philologists may more easily communicate and convey to each other the idea of each particular sound as nearly as possible; for it must be acknowledged that, particularly as relates to barbarous (as they are called) and newly discovered languages, the mode now adopted of expressing or representing the sounds by the alphabetical signs of the nation to which the writer belongs, is very inconvenient, and leads to strange mistakes; for instance, the name of prince *Lee-Boo* of the Pellew islands will appear to a Frenchman to be composed of two dissyllables, because, according to his own orthography, it should be written *Li-Bou;* and, then, an Italian will commit the same mistake, and read *Li-Bo-u*. Mr Pickering of America has published an Essay on a uniform Orthography for the Indian Languages of North America, which we consider as the best work of the kind that has yet appeared. The alphabet that he proposes has been almost universally adopted by American missionaries, not only on this continent, but in the South sea islands. It consists of twenty-seven letters, all borrowed from our Roman alphabet. These letters consist of five pure and five nasal vowels, the latter distinguished from the former by a cedilla underneath, as in the Polish orthography, sixteen consonants, and the aspirate *h*. The guttural sound of the Greek χ is represented by *kh*, the author having been afraid of the Greek character being mistaken for our double letter *x*, as his principal objects were simplicity in theory and facility in practice, in both of which he has, in our opinion, succeeded as far as it is possible to do. (See the *Memoirs of the American Academy of Arts and Sciences*, vol. iv. p. 319.) While we think that such a general alphabet may be of use for unwritten languages, we are of opinion that it is entirely useless for those that have an alphabet of their own, and properly suited to their idiom. Sir William Jones, and, after him, M. de Volney, have expressed the wish that our Roman alphabet might be employed in writing the Arabic, Persian, and other Oriental languages; and the latter has left a considerable legacy to be employed in premiums to those who should discover the best mode of attaining that end. We cannot perceive what benefits will arise from it. He who knows those languages will, of course, be able to read their writing; and he must know how to read it, otherwise their books will be to him a dead letter; and to those who do not, our Roman letters will convey no better idea of the sounds of those idioms than the characters which the nations which speak them have adopted for themselves—nay, we rather think that they will be apt to mislead them. It has become fashionable in Europe to represent the unknown sounds in Oriental proper names by letters different from those formerly used, as if they could convey to the mind the idea of a sound which the ear has never heard. Thus some will write the *Qoran* or the *Khoran*, *Kairo* instead of *Cairo*, *sultaun* instead of *sultan;* and various similar attempts are made to assimilate our pronunciation of proper names to that of the country to which they belong. These only serve to confuse the reader, and do not contribute in the least to the advancement of science. It is impossible to say into how many shapes the name of poor *Genghis-Khan* has been tortured, in order to come nearer to the true pronunciation of his name. We have gained nothing by these vain attempts, except that in these fantastic dresses we no longer know our old acquaintance. We have taken notice, under the head *Indian Languages*, of the curious alphabet invented by the Indian philosopher Guest to represent the sounds of the Cherokee idiom, which may now be considered a *written tongue*. We refer our readers to what is said on that subject; it is pregnant with reflections which, if followed through all the chain of ideas to which they give rise, will greatly contribute to extend and to improve the phonological science, which has not yet made any considerable progress, and may still be considered as in its infancy.

II. *Etymology*. This branch of philology considers words only in relation to their origin, and to their connexion with or relation to each other. We have little to add to what has already been said on this subject in the article *Etymology*, to which we refer our reader. We would refer him also to the excellent work of president de Brosses, entitled *Traité de la Formation méchanique des Langues, et des Principes physiques de l'Etymologie* (Paris, an IX., 2 vols., 12mo), in which this topic is fully and most learnedly discussed. The object of etymology is, by means of the similarity, affinity and probable derivation of words in different languages, to trace, as far as possible, the successive migrations of men from one country to another, and thus to extend and improve our knowledge of the history of the human race. Many learned men have thought that the science of etymology would lead us to the discovery of the primitive language which was spoken by man at the creation. We have given our opinion on this subject under the head *Language*, and we will not repeat what we have said there. We have shown, also, that the verbal affinities which late investigations have discovered between the languages of Europe and those of Western Asia vanish from the moment when we have crossed the river Ganges, and are not to be found in the idioms of the American Indians. All attempts to show the contrary have hitherto failed. It is no reason, however, for further inquiry to be abandoned. There is no knowing what facts investigation may bring to light. The affinities which have been shown to exist between the Sanscrit, for instance, and the Teutonic and Slavonic languages, are well calculated to excite surprise, and to put us on our guard against too strongly asserting the impossibility of further discoveries. It must be owned that the etymological science is very uncertain, and is full of false lights, ever ready to deceive and mislead us. What greater resemblance can there be between two words than between the Indian name *Potomac*, applied to a river in America, and the Greek word *ποταμὸς* (a river)? And yet it is very certain that the former is not derived from the latter, for its Indian etymology is well known. On the other hand, who would believe, if it were not an undoubted fact, that our word *tragedy* is derived from a Greek word signifying a *goat?* and who would now suppose that the English word *wig* is derived from the Latin *pilus* (a hair)? This, however, may be easily shown—Latin, *pilus;* Spanish, *pelo*, thence *peluca;* French, *perruque;* Dutch, *peruik;* English, *perwick*, *perwig*, *periwig*, and, by contraction, *wig*. The Russian and Latin languages appear to be entirely different from each other, yet many verbal affinities may be found between them. We will mention here a few, extracted from an excellent dissertation by Mr Frederic Adelung, of St Petersburg, on the merits of the empress Catharine in promoting philological knowledge:

Russian.	English.	Latin.
Pastir,	Shepherd,	*Pastor*.
Charosch,	Dear,	*Charus*.
Paschet,	He feeds,	*Pascit*.
Ovets,	Sheep,	*Ovis*.
Vidit,	He sees,	*Videt*.
Agnets,	A lamb,	*Agnus*.
Kurmana	A purse,	*Crumena*.
Krugom,	Around.	*Circum Kirkum)*.
Spinu,	A thorn,	*Spina*.
Beret,	He carries,	*Fert*.
Igum,	Yoke,	*Jugum*.
Ssekeroin,	An axe,	*Securis*.
Stroit,	He builds,	*Struit*.

Dom,	A house,	*Domus*.
Obitaiet,	He dwells,	*Habitat*.
Pakoi,	Peace,	*Pax*.
Ssedit,	He sits,	*Sedet*.

To these may be added *levi, lævus; brat, frater; speklo, speculum;* and many others. The same writer has shown similar affinities between the Russian and ancient German. He has put together a few sentences in the two languages containing in the whole fifty words, literally translated from the one language into the other, and striking out all the vowels, and leaving only the consonants as the bones or skeleton of the words, he has shown them to be exactly the same, without the least difference. (See *Catherinens der Grossen Verdienste um die Vergleichende Sprachenkunde*, p. 19.) The numerous affinities between the Sanscrit and the languages of Western Europe are still more remarkable. The following will serve as an example out of a very great number collected by various German philologists:

Ada, I eat; Lat. *edo;* Russ. *yeda.*
Aghni, fire; Lat. *ignis;* Russ. *ogn.*
Aschuga, dry; Ital. *asciugare.*
Bratha, brother; Russ. *brat.*
Bhrouvo, *bhrowan*, the eyebrows; Russ. *brovi.*
Cabala, head; Gr. *κεφαλὴ.*
Da. give (imper.); Lat. *da.*
Dwi, two; Lat. *duo;* Gr. *δύω*; Fr. *deux.*
Dwar, opening; Eng. *door*; Russ. *dver.*
Gada, going; Eng. *to gad* (about).
Ghena, woman; Gr. *γυνὴ*; Russ. *zhena.*
Herda, heart.
Hima. cold; Lat. *hyems* (winter).
Ita, yes; Lat. *ita* (thus).
Yuga, yoke; lat. *jugum;* Fr. *joug.*
Yura. young; Lat. *juvenis.*
Krschra, a scream; Eng. *to screech.*
Kuka, a cock; Fr. *coq.*
Mrita, mortal; Lat. *mors, mortis;* Fr. *mort.*
Marcca, frontier; Eng. *mark* (landmark); old Germ. *mark* (frontier); Ital. *margine;* Eng. *margin.*
Misra, to mix; Lat. *misceo.*
Nasa, the nose.
Nicht, nothing; Germ. *nichts.*
Padi. road, way; Eng. *path.*
Shoostri, sister; Germ. *schwester.*
Sonnu, son.
Sourgo, height; Lat. *surgo*
Tri, three; Lat. *tres;* Ital. *tre.*
Vaihon, wind; Dutch, *Waaijen* (to blow, bluster).
Wartana, *warti*, guardian, doorkeeper; Germ. *warten.*

Amidst all these affinities existing among so many languages, how is the mother tongue to be discovered? The task is undoubtedly very difficult, but, to a certain degree, perhaps, not impossible. We are inclined to think that the filiation of languages may be pursued to a great extent. Before that is done, however, it will be necessary to establish certain rules, to direct our researches in the thorny paths of etymology.

By way of example, we shall suggest one rule or canon, which, we are of opinion, will go a great way towards serving us as a clew in this complicated labyrinth. If, in a given language, a radical or primitive word should be found, accompanied with what may be called its *family*, that is to say, its various compounds and derivatives, and if, in another, we should find only the root, or but a few of the derivatives or compounds, we may safely say, that, as far as that goes, the latter is derived from the former. Thus we find in the French the radical word *roi*, with its derivatives *reine* (formerly *royne*), *royal*, *royauté*, &c.; while, in English, we find the derivatives *royal*, *royalty*, *royally*, under the primitive *king*. We may then be well assured that the English language has borrowed these derivatives from the French, and, for the origin of the primitive *king*, we must look somewhere else, until we find the whole family of that word existing together in one idiom.

Another example may be adduced. In the Basque language, undoubtedly one of the most ancient that exists, the primitive word *bi* signifies the numeral *two*. All the family of that word is derived from it or compounded with it; *bigarrena*, second; *birretan*, *biarretan*, twice; *bitan ambat*, double; *biderbiro*, doubly; *biderbitu*, to double; *bina*, *binaca*, two and two; *amabi*, twelve (ten and two); *bicoa*, of two; *bitan*, *bian*, in two (speaking of things); *bigan*, in two (speaking of persons), &c. In the Latin tongue, we do not find the simple or primitive word *bi;* for *two* is expressed by *duo*, a word derived from the Greek, which has compounds and derivatives of its own; but we find a part of its family, *bis*, twice; *binus*, *biceps*, *bicolor*, *bidens*, &c. What are we to infer from this fact, which deserves, at least, to be remarked? We think it not improbable, that the Basque language, many centuries ago, was spoken in Italy, or, at least, some dialect derived from it, in which was found the primitive word *bi*, with its family; that, in consequence of successive invasions and conquests, that language was pushed farther westward, and other idioms took its place, and, either mediately or immediately, the Greek word *duo* was introduced, while *bis* and some of its compounds remained. Some other language introduced the verb *sequor*, whence *secundus* was derived, and expelled the Basque word *bigarrena;* but the word *bis* could not be driven off; there remained with it many words derived or compounded from *bi*, such as *binus*, *biceps*, &c., which gradually adapted themselves to the analogies of the new language. It will be said, perhaps, that the Latin word *bis* is the Eolic form of the Greek δις, because it is known that in that dialect, the δ was often changed into β; but why should not the Eolic βις be also derived from the Basque? The baron W. von Humboldt has discovered many affinities between that language and the Greek. (See the *Mithridates*, vol. iv. p. 282.) The word *other* (alter), which, in several languages, as, for instance, in German, is made use of for *second* (*der andere*), is, in Basque, *bestea*, *bercea;* *formerly* (in Fr. *autrefois*) *berris;* *other thing*, *besteric*. In all these words we find the letter *b*, and the analogy of all these words with *bi* is not to be doubted. We do not think we have gone too far, in asserting the probability that the Basque language, in various dialects, was once spoken in a great part of Europe, and, amongst other places, in Italy. It is impossible not to come to this conclusion, when we consider how much that idiom differs from all others, not only in the derivation of its words, but in its grammatical forms, which have no parallel any where in the old world, and although they resemble, in some degree, those of the American Indian languages, yet differ sufficiently from them to show that there is no real affinity between them. (See *Historical and Literary Transactions of the American Philosophical Society*, vol. i. p. 39.) Now, we know that mankind are every where imitators, and that, in the gradual formation of their languages, they borrow a great deal from each other; we cannot, therefore, form an idea of a language so widely different from all others, and particularly from those by which it is surrounded, without coupling with this fact the idea of the most remote antiquity, and of times when the people who now speak that language extended themselves in various tribes, through a very large extent of country. The learned baron W. von Humboldt has shown, in an elaborate treatise, that many proper names of places in what is now Italy, are evidently of Basque origin; and we have no doubt, that further investigation will show numerous derivations, like those from the word *bi*, in the ancient and modern languages of the Italian peninsula, which may be traced to the idiom now spoken in Biscay.—See the interesting dissertation entitled *Prüfung der Untersuchungen über die Urbewohner Hispaniens, vermittelst der Vaskischen Sprache*, by Wilhelm von Humboldt (Berlin, 1821.)

We cannot take leave of this branch of our subject without mentioning a curious proof of the antiquity of the Basque language, which is given us by the same writer, baron W. von Humboldt, in his addenda to the second volume of the *Mithridates*, published in the fourth part of that work which appeared in 1817. It is an original song, or poem, in that idiom, recording the five years' war in which the Biscayans were engaged against the Romans, who invaded their country under Octavianus Augustus, at the end of which, after excessive sufferings, they were not treated as a conquered nation, but were received into the alliance of the Roman people. The baron has given us a part of that poem in the original, with a German translation, which we think our readers will not dislike to see in an English dress:

1. Lelo is dead, Lelo is dead: Zara was the murderer of Lelo.
2. The strangers from Rome declared war against us; and Biscay set up her song of victory.
3. On one side was Octavianus; on the other, Lecobidi, the Biscayan.
4. Master of the sea and of the strongholds, he surrounded and besieged us.
5. The dry plains were his, and so were the shady forests of the mountains.
6. When we were posted in favourable spots, every one felt himself strong and courageous.
7. We are all brothers in arms, and have little fear: but, oh! bread-basket, thou art sick.
8. They cased themselves in heavy armour; but the unarmed body is light and quick in its motions.
9. During five long years we were besieged; we had no rest by day or by night.
10. If they murdered one of our men, they lost fifty of theirs.
11. But though they were so numerous, and we only a small band, we made, in the end, with them a treaty of alliance.

It may be asked, perhaps, Who was this Lelo, whose death is bewailed in the first stanza of this poem, and whose name is not afterwards mentioned? Tradition relates, that, at a very distant period, a Biscayan warrior, named *Lelo*, was obliged to march against the enemy. During his absence, his wife, Tota, was unfaithful to him, and had a child by her paramour, named *Zara*. When Lelo returned from the war, the guilty lovers caused him to be murdered; but the crime was discovered; the indignant people expelled the criminals from their territory, and it was resolved, in a general assembly of the nation, that, thenceforth, every song should begin with a stanza to the memory of the unfortunate Lelo. There are yet in Biscay, says Mr. von Humboldt, some aged people, who recollect an old song, the burden of which is

Leluan, Lelo,
Leluan dot gogo.

I think of Lelo, Lelo;
I think of Lelo.

See *Mithrid.*, vol. iv. p. 353.

III. *Ideology.* We have hitherto considered the elements of language in their simplest forms; we are now to take a view of them as modified by various combinations, which men have agreed upon to facilitate their mutual intercourse. These modifications have been called *grammatical forms*, and are by no means the same in all languages, but differ according to the points of view in which men have considered the ideas which they meant to express, or, rather, to awaken in the minds of others, by words and sentences. There are very few ideas that we may call absolutely simple; when we speak of a tree, we have in the eye of our mind, "a plant fastened to the ground by means of roots, having a trunk, leaves and branches, and bearing flowers and fruits in a certain season." All these things are included in the idea of what we call a tree. By a *church* or *temple*, we understand "a place or a house where people assemble to pray to an Almighty Being." To express all this, we may either divide the general idea into its component parts, or combine these together. In the latter case, we shall express the whole by one word; in the former, by several. Thus in our own language, we say sometimes an *inn*, sometimes a *public house*, and sometimes a *house of entertainment*, making use, indifferently, of one, two, or three words to express the same thing, or represent it to the mind of the hearer. This divisibility of ideas is the origin of *grammatical forms* in language. It is only since the beginning of the present century, that this variety of forms in human language has attracted the attention of the learned, and that the idioms of even the most savage nations have been studied with a view to ascertain their grammatical structure. The results have been not less curious than interesting, inasmuch as they display the various operations of the mind of man in the formation of languages. Great pains were formerly taken to trace them up to a single original type, which was to have been the primitive language; but, as the comparison of words, in respect to their etymology and derivation from each other, has failed in leading us thus far, so has the comparison of grammatical forms, which, as we have observed before, in our article *Language*, rather tends to show that the existing languages have not had a common origin. Let us take a cursory view of their various structures.

There is, in the south-eastern division of Asia, a group of nations whose languages are distinguished by a singular formation, the like to which is not found in any other part of the globe. The population of those nations, according to Adelung, amounts to about one eighth of the whole number of the inhabitants of that part of the world. (See the *Mithridates*, vol. i. p. 27.) The languages of those nations are composed of a very small number of monosyllables. M. Remusat, in his *Essai sur la Langue et la Litterature Chinoise* (p. 55), has calculated that those of the Chinese, the best known of these idioms, do not exceed the number of 400, but that, varied as they are by four different tones or accents (some writers say five), they may go as high as 1600, or, at most, 2000. By the side of that spoken idiom there is a *written language* (as it is called), consisting according to the same author (p. 56), of 80,000 characters. Each of those characters answers to a word or monosyllable of the spoken language, and *vice versa*. (*Grammaire Chinoise, par* Remusat, p. 1). This would be difficult to comprehend, if we did not know that the Chinese abounds in homophonous words, which are represented by different characters, as in French the words *cens, cent, sang, sans, sens, sent*, are to the eye different from each other, though to the ear they are the same, and still mean different things. These homophonies, however, produce no confusion in speech, partly owing to the tones or accents, to the place which they hold in the sentence, as is the case in the French words *sage-femme* and *femme sage*, and above all, to the subject and context of the discourse, Mr Adelung (1 *Mithrid*, 87) gives a curious example of those homophonies in the language of Tonquin (one of those we are speaking of), which deserves to be noticed. In that monosyllabic idiom, the word *ba* has six different significations; it means *a lord*, *abandoned*, *something contemptible*, *three*, *present*, and *the concubine of a prince*; and this word, repeated six times, and varied by different tones or accents, makes the following sentence:—"Three lords made a present to the concubine of a prince. How contemptible that is." Mr Adelung quotes no authority for this fact, which is, at least, curious, if not exaggerated. Sinologists agree that the Chinese language, on the model of which the Tonquinese appears to be formed, is entirely destitute of grammatical forms. It has no affixes nor suffixes, no inflections of words, declensions of nouns, nor conjugations of verbs, and but very few auxiliary words, designating the various relations of speech. (See Remusat, *Essai sur la Langue*, &c., p 27.) It is, says Mr Adelung, a language entirely composed of roots, poor in words, and rich in tropes (1 *Mithrid.*, 43—93); its grammar consists in the choice of words, its syntax in their juxtaposition; it is satisfied with awakening leading ideas; all that is merely accessory or auxiliary is understood or guessed at. Of course, the Chinese idiom is essentially elliptical. This extraordinary structure of language extends to the south to the peninsula of Malacca, where begins another class of languages, and to the west to Hindoostan.

Our knowledge of these monosyllabic idioms is yet very limited, but it is daily increasing by the labours of the learned. The Asiatic society of Calcutta, until the late conquest of part of the Birman empire, occupied itself more with the languages of the peninsula of India than with those of the countries situated between the gulf of Siam and the Yellow sea. It is, nevertheless, to that illustrious association that we owe the most detailed facts that we possess respecting those idioms. In the first place, captain Towers has made us acquainted with the languages of Ava and Arracan, and their alphabetical system of writing (5 *Asiat. Researches*, 143; next, Mr Buchanan initiated us further into the knowledge of the languages, religion and literature of the Birman empire (ibid. page 209); and lastly, doctor Leyden has given us a most interesting view of the languages which he denominates *Indo-Chinese*, part of which fill the space between the Chinese empire and Hindoostan. Those languages, among which that of Thibet is not included, are fourteen in number, seven of which, including the sacred language called *Bali*, or *Pali*, are polysyllabic, and the seven others monosyllabic. These last are the Bukheng, or language of Arracan; the Barma, or Avanese; the Môn, or Peguan: the T'hay, or Siamese; the Khohmen, or idiom of Camboje; the Law, or language of Laos, and the Anam, or language of Tonquin and Cochin-China. The seven others are the Malay, and the different languages of the islands of Sunda and the Philippines (10 *Asiat. Res.* 158, 163). Mr Klaproth, in his *Asia Polyglotta*, has not adopted this classification of the Indo-Chinese languages. He has divided those called *monosyllabic*, considered in an etymological point of view, into seven branches, which are the Corean, the Thibetan, the Chinese, the Anamitic, the Siamese, the Avanese, and the Peguan. Dr Leyden's description comprehends all these, except the Thibetan and the Corean, which, however, belong to the class of monosyllabic idioms. This description, nevertheless, is of the highest interest. It shows us the monosyllabic languages gradually mixing with the polysyllabic, and these with them, so that the one or the other form predominates as they approach or recede from the territories of China and Hindoostan respectively, until one of them assumes the entire mastership. Thus the languages of Ava and Arracan borrow polysyllabic words from those of their neighbours; these changes, however, are not numerous, the general character of the language always remaining monosyllabic. On the other hand, doctor Leyden shows us the Malay idiom, participating, in a very high degree, in the simplicity of the monosyllabic tongues,—a character which this class of languages preserves quite across the Pacific ocean to a very short distance from the American continent, where suddenly appears the most complicated system of human language that exists, perhaps, on the face of the earth, extending over the whole of that vast continent. This picture is admirable, and gives rise to a crowd of reflections. Here would be the place to describe the grammatical forms and character of that remarkable class of languages which pervades the whole continent of America, thence passes over into Greenland on the one side, on the other into that neck of land in Asia, inhabited by the Tschutschki, and which, it is well ascertained, once prevailed in the West India islands. But this has been so fully done in the article *Indian languages*, that further expatiating upon that subject would be but a useless repetition; and we therefore will content ourselves with referring our readers to that article. It will amply satisfy their curiosity.

The monosyllabic languages of south-eastern Asia and the polysyllabic idioms of America may be considered as the two extremes in the great chain of human modes of speech. On the one side, we find the greatest simplicity and a total absence of forms, a scanty number of words, and those all monosyllabic, while on the other we observe all the opposite characteristics, languages essentially polysyllabic, and in which monosyllables are rarely to be found, artificial and complicated grammatical forms, words that can be compounded to any extent; and, what is more remarkable, the former class of languages belongs to nations in a great degree civilized, and who, for many ages, have cultivated arts and sciences, and lived under regular governments, while the latter are spoken by savage nations ignorant of arts, associating without laws or forms of government, and living together in a state of nature. No reasoning *à priori* could ever have led to the supposition of similar results; but the facts exist, and cannot be denied, and philosophy is at a loss to point out the cause from which they have been produced. Passing on from Greenland, the north-eastermost part of America, to Iceland, and from thence to the north-western coast of Europe, we find an immense and an abrupt change in the character of languages. The Scandinavian dialects are not, indeed, monosyllabic, but they abound in prepositions, conjunctions, and a variety of particles, with which their discourse is chiefly connected. Few inflections exist in those languages. Their grammatical forms are simple, their syntax natural, and their system, on the whole, the least complex of any that exists in that part of the world. On the Asiatic side are the idioms of the Samoiede and Siberian tribes, the structure of which is but little known; but it is sufficiently ascertained that it bears no resemblance to that of the American languages. In Japan, we are struck with a remarkable fact—two languages existing at the same time, the one monosyllabic and atactic, like the Chinese, and the other polysyllabic, with numerous inflections and grammatical forms. The former is called the *Koye*, the latter the *Yomi*. Both are in use at the same time, and occasionally intermix with each other, still preserving their general character and peculiar structure. See *Elémens de la Grammaire Japonaise, par le P. Rodriguez, traduits du Portugais, par M. C. Landusse* (Paris 1825.)

It would be exceeding the limits of this article, were we to take notice of all the varieties that exist in the structure and grammatical forms of the numerous languages of the old world. It is sufficient to have pointed out the most striking diversities, and to have marked out the way for those who are disposed to inquire further into this interesting subject. It is a wide field, which has as yet been but superficially examined, and from a more particular investigation of which most important results may be expected. Hitherto, the classification of languages by philologists has only had regard to their etymological affinities. They have been divided into families, supposed to have been derived from a common stock, or from each other. No objection can be made to this distribution, which has been followed by Adelung, Vater, Klaproth, Balbi, and all the other eminent linguists. But languages are also susceptible of being classed according to their grammatical structure, which is not the least prominent feature in their external appearance; and such a classification will considerably aid in tracing idioms to their respective sources. Mr Duponceau has given us an outline of his ideas upon the subject. He has only noticed the great divisions, and sketched out a few genera, leaving the species and varieties to be described hereafter. He divides the languages of the old hemisphere into four classes, the first consisting of the Chinese and its cognate idioms, which he calls *asyntactic*. The Scandinavian and Teutonic languages form a second class, which he calls *analytic*, "because," says he, "their forms are so organized that almost every idea has a single word to convey or express it." The third class consists of those languages in which several ideas are combined into one word, by means of inflections, affixes, suffixes, and other grammatical forms. Such are the Oriental languages, the Latin, Greek, Slavonic, and others of the same description. These he calls *synthetic*. Of the French, Italian, Spanish, Portuguese, with their various dialects, in which conquest has, in a great degree, intermixed the modes of speech of the second and third class, he forms a fourth, which he calls *mixed*. Of the American languages, the most complicated of all, he makes a fifth class or genus, under the name of *polysynthetic*. (See the correspondence between Mr Duponceau and Mr Heckewelder in the first volume of the Historical and Literary Transactions of the American Philosophical Society, pp. 400, 401.) It is easy to perceive that this is not a complete classification of languages in respect to their forms. The Basque does not appear to be included in any one of the five classes; nor is the Coptic noticed, nor the Finic, and others of the family called *Tschudish*, though all those idioms and others, such as, for instance, the Malay and its numerous family, have peculiar characters, which philology will hereafter more accurately define. The languages of the interior of Africa, will also be a subject of particular investigation in this point of view. The ideology of languages, as we have already observed, is yet in its infancy, and waits the hand of genius to methodize and elucidate it. If, however, it shall continue to advance, as it has done within the last thirty years, there is no doubt but that it will, in time, throw considerable light on the history of man.

PHILOLOGY, *in a narrower sense*. At the beginning of the preceding article, the various meanings of the word *philology* have been given, and the subject has been treated in its widest acceptation. We shall now give a few words on philology in a more limited sense, meaning the knowledge and criticism of the ancient languages and the works written therein, in which sense the word is commonly used by the Germans, who give to the science in its wider sense the designation of *Linguistik* or *Sprachenkunde* (science of languages.)

History of Philology. Eratosthenes (270—290 B. C.) was first called *philologus*. He was famous as an astronomer and geographer, and was, at the same time, superintendent of the Alexandrian library. The philology of the early Alexandrians embraced antiquities, in its wider sense, especially mythology, grammar, hermeneutics, grammatical and philosophical criticism, rhetoric and prosody. (See *Alexandrian School*.) Through their means chiefly the most important monuments of Greek literature have descended to us; and our power of understanding and relishing them is, in a great measure, owing to the investigations of the Alexandrians into the use of words, the construction of language, the genuineness of whole works and single passages, and to their learned commentaries and compilations. Creuzer, in his learned and ingenious work On the Academical Study of Antiquity (in German, Heidelberg, 1807), thinks that traces of this philology are perceptible as early as the age of the Pisistratides, whose merits, in respect to the collection of the Homeric poems, are known; also in the establishment of libraries after the time of Pisistratus, in the spirit of inquiry which marked the Sophists, and the manifold learning and literary accomplishments of Aristotle; but Alexandria he justly calls the first centre of a learned life and activity. In Asia Minor, also, where Pergamus was distinguished whose kings, particularly Attalus II. (died 153 B. C.), were patrons and cultivators of literature: in Greece Proper, particularly in Athens and Rhodes; in Magna Græcia, and more especially, in Syracuse, literati and philologists in the narrower sense arose. Scholiasts and lexicographers are found among the Greeks as late as the fifteenth century, since the influence of Greek literature in the Eastern Roman empire never ceased entirely.

The Romans were first led to a scientific study of the Greek language by the Greek Crates of Mallus (169 B. C.). Philological or grammatical science embraced, according to Cicero, also the critical study of the Greek poets, the knowledge of history, the explanation of words, and correct pronunciation. Besides the Greek, the Roman language and Roman antiquities were also cultivated by M. Terentius Varro, a celebrated historian and multifarious writer (116—127 B. C.), M. Verrius Flaccus (under Augustus), Asinius Pollio and others; and the principles of the Greek language were applied to the Latin. Lucius Plotius taught Latin grammar in Cicero's time. M. Fab. Quintilian and Aul. Gellius were philologists in a wider sense. The most considerable libraries were carried to Rome. Roman literature strove to imitate the Greek. Then appeared commentators on Roman authors (as Asconius Pedianus on Cicero's speeches, Ælius Donatus on Terence and others) after 50 A. D., of whom many delivered lectures on the Roman classics. Donatus (354 A. D.) and Priscianus (524 A. D.) are among the chief writers on Latin grammar.

In proportion as Christianity extinguished paganism, the study of the Greek and Roman antiquities and literature was discouraged, especially by the earliest teachers of Christianity, who considered every thing connected with paganism injurious and corrupting, and thus contributed considerably to the decline of learning and science. It was not, indeed, to be expected that the early Christians should have contemplated the excellences and defects of pagan antiquity with that spirit of calm reflection which regards paganism as a necessary link in the chain of human development. The zeal which drove the first propagators of the new faith to act and to suffer for their religion naturally excited them against a literature which sprang from a pagan period, and breathed a pagan spirit. Another cause of the decline of learning is found in the irruption of the rude Teutonic tribes into the Roman empire, by which many literary institutions, particularly those established by the emperors for the education of the higher classes, were ruined. But the clergy needed a learned education, especially the knowledge of ancient languages, to prepare them for the discharge of their religious duties. This brought the cultivation of profane science into the hands of the clergy, who connected schools with the abbeys and convents, in which the (so called) seven liberal arts were taught. The institutions of the Christian priesthood, therefore, now became the ark in which the ancient sciences, such as they then were, were preserved amidst the ruin of civilization. In these seminaries of instruction generally the text-books of Martianus Capella (461 A. D.) and Cassiodorus (who died 563) were used, as they had been in the schools of the empire. Such clerical schools are first found, in the sixth century, in France, later in Ireland, Scotland and England. The studies pursued were, indeed, at first limited to the purposes of theology. The Latin language, therefore, took a new colour, particularly as hardly any other language was written; and the want of classical knowledge, the influence of clerical and religious conceptions, and the rise of modern European languages, modified its character. Thus originated monkish Latin. The progress of learning was much promoted by the foundation of the Benedictine order by Benedict of Norcia (died 544), in the rules of which it was ordered that, in every convent of the order, instruction should be given, books copied, and libraries collected. The schools which Charlemagne and his learned friends established conduced to the study of the ancient languages. But it was not till the tenth century that good taste, and learned education, and a comparatively pure Latinity, may be said to have existed. These had their origin in the frequent reading and copying of the classics. In this consists the chief merit of the congregation of Cluny, and, at a later time, of the order of Cistercians and Carthusians (since the twelfth century). The Arabian literature and language spread considerably after the seventh century, and gained much influence. Philology was preserved and fostered by the Arabians, and, particularly, Greek literature revived. Their own language received a learned character as early as the seventh century.

In the eleventh and twelfth centuries, many great men distinguished themselves by a profound study of classical literature, especially in Italy (where, after the twelfth century, several universities were established), in France and England. To these belong Lanfranc of Pavia and his pupils Anselm of Aosta, the learned Gerbert (pope Sylvester II., who died 1003), bishop Abbo of Fleury (died 1004), and Bruno of Cologne (died 1101). Learned theology led to the study of philosophy, and this to Plato and Aristotle. Men like Abelard (died 1142), Bernard of Clairvaux, John of Salisbury, Roger Bacon, and others, understood Greek, and wrote better Latin than their predecessors; but they had to struggle hard with the ignorant and intolerant clergy, after which (in the thirteenth century) the study of the Roman classics and the cultivation of a purer Latinity ceased again almost entirely. In the thirteenth and fourteenth centuries, we find some institutions in which the knowledge of the Oriental languages, as far as was necessary for missionary purposes, particularly Hebrew and Arabic, were taught; and the knowledge of them was increased by the intercourse between Christians and Mohammedans in the crusades; but the languages could hardly be said to be scientifically cultivated.

In the middle of the fourteenth century, the genius of classical antiquity revived again in Italy, whence a more profound study and a more elegant criticism of the classic languages and literature diffused itself over all parts of Europe. Italy became the first theatre of true philologists. Two of her greatest national writers, Petrarca and Boccaccio, enthusiastic for the productions of antiquity, laboured effectually for the diffusion of Roman and Greek literature. Cicero and Virgil attracted, particularly, the attention of the former, yet he induced Boccaccio to learn the language of Homer and Plato from fugitive Greeks—a study in which his own advanced age prevented him from succeeding. Boccaccio obtained the appointment of John of Ravenna, a pupil of Petrarca, as teacher of Roman literature in Florence, his native city, and of Leontius Pilatus, and, after him, Manuel Chrysoloras (1397), as teachers of Greek literature. Through the efforts of the latter, as well as those of Argyropulus, and others, who fled to Italy when the eastern empire was destroyed, a more thorough knowledge of the Greek language and literature was diffused by writings and oral instruction. Lectures on ancient literature were delivered in all the larger cities of Italy, even in those which had no universities. The enthusiasm of the teachers communicated itself to their hearers, and it became customary with republics and princely houses (from 1400 to 1450) to patronise classical literature, and to restore a purer taste by its study. This study, in fact, was elevated to a national concern. A zeal for classical literature animated all classes in Italy in the fifteenth century, and every where philological societies were founded. Many private and public libraries were also established, and the treasures stored up in the convents made more accessible, since the times of Petrarca and Boccaccio, who themselves collected the works of Roman and Greek writers, and circulated copies of them. Cosmo of Medici founded at Florence the Platonic academy (1429); his nephew Lorenzo collected the richest treasures of literature and art, and attracted the most distinguished scholars to that city of the muses. In Rome, Nicolas V. was active; in Milan, Visconti; in Verona, Della Scala; in Sicily, king Robert; in Venice, Aldus Manutius formed a circle enthusiastically devoted to classical literature, and the new art of printing was particularly serviceable to the study. The works of ancient authors were now rapidly multiplied: collections and commentators appeared, and philology was enabled to assume a scientific form, as different scholars could avail themselves with comparative ease of the fruits of each other's labours, and the standard works of taste and criticism became comparatively secure from loss and injury. The study of the classics and of ancient languages was no longer confined to the purposes of theology, but was directed to the general improvement of the human mind. Successful imitations of the ancients were now produced, and a purer Latin style arose, on which, perhaps, too great a value was laid. To this period belong Leonardo Bruni of Arezzo (1370 to 1444), Poggio Bracciolini (1380 to 1459), Lorenzo Valla (1407 to 1457), Nic. Perrotus, Franc. Philelphus, Pompon. Lætus, Marsilio Ficino (1433—1499) and Angelo Polisiano (1454—1492).

From Italy, this renewed zeal for the cultivation of philology first communicated itself to France. We find, in the fifteenth century, Greek and Italian teachers of philology in Paris, and many translations of Roman classics into French. This period, with its momentous consequences, is of the highest importance to the student of history. A new era begins in the history of civilization with the revival of the study of the classics, which, by degrees, exercises a decisive influence on religion and politics, the sciences and arts, and the whole tone of society. It is a most interesting task to the philosophic student, to trace the causes of this triumph of pagan civilization over Christian Europe, by means of the languages and literature of ages long gone by; to witness the gradual awakening of the nations in proportion to the enthusiasm with which they devoted themselves to the new study; to contemplate the gradual decline of this enthusiasm after it had produced its proper effects (as the blossom fades when the fruit is formed); and to analyze the injurious consequences of the exclusive hold which these studies so long possessed over the minds of men:—we say *injurious* consequences, for it is, perhaps, a law of our nature that the causes which strongly stir mankind, and urge them forward in civilization, must lead to excess and corruption, eventually removed by the action of some new mighty agent; and the undue devotion to classical antiquity did produce, in some respects, deleterious effects, from which our age is now labouring to free itself. In Britain, a scientific philology was introduced about the end of the fifteenth century, by means of some scholars educated in Italy. In Germany, it came in principally through the Netherlands, and the way for it was prepared by a reform in the mode of teaching in schools in Lower Germany. The first philologists of Germany were educated in Italy; for example, Rud. Agricola (1442—1485), C. Celtes (1459—1508), and John Renchlin (1454—1521). The first was a scholar of Thomas a Kempis, the second was principally distinguished as the founder of learned societies in Germany, the last by the revival of the Hebrew philology. In this century, we find one of the first humanists (*humaniora* was the name given, since the middle ages, to the sciences which introduced the student to an acquaintance with classical antiquities, and the teachers of these sciences were exclusively called *humanists*), who exerted a great influence in Germany, and particularly promoted the study of Greek literature—we mean Desiderius Erasmus (1467—1536).

From the end of the sixteenth century, when the study of ancient literature had again declined in Italy (in later times, it has been cultivated there almost with an exclusive reference to the history of art and to antiquities), Holland was the school of the greatest philologists, who did much service, particularly in regard to the etymology of the ancient languages, in grammar, verbal criticism and grammatical explanations, and, more lately, have applied philology principally to the study of jurisprudence. Among the scholars of Holland is the celebrated Hugo de Groot (Grotius) (1583—1645), who was a master in exegesis, and united philology more closely with theology; Justus Lipsius, Adr. Jonghe (Junius), Gruter, Dan. and Nic. Heinsius, the Gronovii, Burmann, Perizonius, Lamb. Bos, Siegbert Havercamp, Drakenborch, Oudendorp, Hemsterhuis, Wesseling, Lennep, Hoogeven, Valkenaer, Ruhnken, Wyttenbach, and others. Oriental philology was also here advanced; for example, by the celebrated Orientalist Erpenius (1584—1624), Leusden, H. Reland, Albert Schultens (1686—1750), who makes an epoch in this science, &c. Th. Creech, Barnes, John Hudson, Baxter, Clarke, John Taylor, Rich. Davis, Wakefield, Robert Wood, Zach. Pearce, Middleton, Potter, Heath, Warton, Musgrave, Tyrwhitt, John Toup, Rich. Bentley and Rich. Porson are the most distinguished among the English classical philologists. But Oriental philology was also much cultivated in England, by Selden, Lightfoot, Walton, Sam. Clarke, Pearson, Castell, Lowth, Kennicot, &c., and the study of the modern languages has been carried, by the diffusion of the English over so many countries, to an unexampled height, while the study of classical philology has somewhat declined in that country.

In France, philology, especially since the commencement of the sixteenth century, has found many patrons and friends. In that country, it has been applied particularly to theology and jurisprudence, but less cultivated as an independent branch of science. Among the French philologists of the former sort are William Bude or Budæus (1467—1540), and after him, James Cujacins, Brissonius Dionysius Gothofredus (who died in 1622), and others. Among the classical philologists of France are distinguished Lambin, Muretus, the learned printers Rob. and Hen. Stephanus (Etienne), the multifarious scholar Jul. Cæs. Scaliger (Della Scala, originally of Verona), his son Jos. Just. Scaliger, also Hadr. Turnebus (Tournebœuf), Claudius Salmasius (Saumaise), Isaac Casanbon, Vigerius (Vigier), Du Fresne, Faber (Le Fevre), the archæologist Montfaucon and others. The study of classical literature had a great effect upon the French national literature, in which (for instance, in tragedy) they strove to imitate the ancients. In later times, philological studies have been very much neglected in that country, and it affords only a few distinguished names, as Villoison, La Rochette, Boissonade, Larcher, Gail. In the seventeenth century, Oriental philology found friends, among the French—Bochart, D'Herbelot, Le Jay, La Croze, Houbigant, and others; and owes much to the celebrated scholars of our time, Silvestre de Sacy and Lonis Matthien Langlès. The knowledge of modern languages has been less necessary to the French on account of the great extension of their own.

The Spanish and Portuguese have only a few distinguished philologists; but the number of Germans who have investigated profoundly and extensively the classical languages and antiquities is very great. To the sixteenth century belong Joach. Camerarius, the promoter of Grecian literature; the lexicographer Bas. Faber, and the learned antiquarian Joh. George Grævins (Grave); to the seventeenth century, in which philology was less favoured, the learned Caspar Barth, John Freinsheim, Weller, Chris. Cellarius; to the eighteenth, Ludolf Kuster, Francis Budæus, J. A. Fabricius, Lange, Frisch, Hedericus; since the middle of that century, John Matth. Gesner established a profound and tasteful philological school, with which the flourishing period of independent philology begins among the Germans, which was carried to a great height by Winckelmann, Lessing and Herder. In later times, Germany can boast of Ernesti, Reiske, Heusinger, Duker, Wesseling, Fischer, Reiz, Brunck. To the nineteenth century belong the following, the greater part of whom are still living:—Heyne, Wolf, Beck, Schneider, Harles, Matthia, Buttmann, Schutz, Oberlin, Spalding, Schweighauser, Hermann, Heindorf, Schafer, Bockh, Creuzer, Schleiermacher, Bekker, Voss, Eichstadt, Jacobs, Passow, and others. Oriental philology, particularly the Hebrew literature and language, was cultivated in the sixteenth century, by Buxtorf; in the seventeenth, by Glass, Pfeifer; in the eighteenth and nineteenth, by Michaelis, Dantz, Dathe, Hezel, Cocceii, Schnurrer, Tychsen, Eichhorn, Paulus, Von Hammer, Vater, Gesenius; of late the Sanscrit by A. W. Schlegel, Kosegarten, Bopp, the Chinese by Montucci and Klaproth, and several others. The influence of this philological industry appears principally in theology, for we find the greatest exegetical writers among the Germans since the time of the reformation. Melanchthon and Beza were distinguished before. In the seventeenth century, there follow Jablonski, Herman von der Hardt, Reineccius, Simon; in the eighteenth, Semler, Ernesti, Morus, Koppe, Ilgen, Griesbach, Matthia, Storr, Nosselt, Knapp, Paulus, the Rosenmullers, De Wette, &c. Jurisprudence was investigated from its sources by means of philology, and cultivated as one of the learned sciences, which character it still bears in Germany. The study of history and geography has been, by its means, cultivated and extended in various ways, and no department of the sciences and arts has been without its support, and, conversely, the study of classical literature has been promoted by antiquarian and archæological knowledge, as in the cases of Heyne, Bottiger, Voss.

In the history of philology, since the revival of learning, Creuzer distinguishes several periods. The first was characterized by the spirit of imitation, when men were enraptured with the beauty of the works to which they were for the first time introduced, and a spirit of imitation almost unconsciously took possession of them, and appeared in all their labours. At this time, they had not learned to distinguish what was accidental from what was essential to the excellence they so much admired. Representatives of this period are Poggio, Angelo, Poliziano, and Marsilio Ficino, the latter a reviver of ancient philosophy. Then follows the period which Creuzer calls that of *realism*, when men became possessed with a love for wide and deep learning. It had its origin in the well founded opinion of the necessity of great and thorough knowledge for the restoring and illustrating of the works of antiquity, but it led to the accumulation of unwieldy stores of learning, which impeded the proper activity of the mind. Scaliger, Claude, Saumaise, Gerh. and John Vossius, Casp. Barth, and others, represent this period, and partake more or less in its errors.

What these great accumulators had brought together was first rendered truly useful by the critical labours of the following period, which we may call the *period of understanding*, when a discriminating criticism was applied to these stores. The merits and the genuineness of ancient works were now more carefully examined. A more accurate study of language and a more continual reference to the context, gave greater weight to criticism. A methodical arrangement of knowledge, judicious selection, acute thinking, and correct taste, were now more prized than vast erudition. In this period, the bold and ingenious Richard Bentley, the thorough and judicious Tib. Hemsterhuis, are distinguished. Rhunken, Valkenaer, and several of the living philologists of Germany, including the celebrated Greek scholar Hermann, belong to the same class. The meaning of *philology*, even in the limited character in which it has just been considered, is not accurately settled. The famous Fr. Aug. Wolf calls it, without any qualification, the science of antiquities in general.—See *Museum der Alterthumswissenschaft*, edit. by Wolf & Buttman (vol. i. 1807). Others go equally far in restricting its meaning. Wherever the limits of the two sciences may be fixed, it is certain that philology and archæology are so intimately connected that one is indispensable to the other.

Philology, as the science which embraces the languages and literature of antiquity, comprises an acquaintance with grammar, with hermeneutics, or the science of interpretation (implying, of course, the power of criticism and emendation), with the theory of prose and metrical composition and with the history of Greek and Roman literature. Wolf says there exist 1600 Greek and Roman authors, preserved entire or in fragments, exclusive of the fathers of the church, and of this number, the Latin authors amount to little more than a quarter. The auxiliary sciences to philology are, 1. ancient geography (which is divided, by Wolf, into mythical geography, or *uranography*, historical geography, with chorography and topography); 2. the general history of the nations of antiquity, together with chronology and historical criticism as subsidiary to it; 3. Greek and Roman antiquities, or the history of particular circumstances, of the constitution and customs of the chief tribes of Greece and of the Romans; 4. mythology, or a knowledge of the religious tales of the Greeks and Romans; 5. the history of their philosophy and their other sciences; 6. the history of ancient art, poetry included; 7. archæology, to which belong epigraphics, or the knowledge of the inscriptions of both nations, and numismatics; 8. the history of philology; 9. æsthetics (particularly in relation to poetry) and philosophical criticism on the value of ancient authors.

In the history of philology we have touched upon the remarkable hold which the literature of Greece and Rome, above that of all other nations, has acquired upon the minds of men, and it is not strange that so beautiful a literature, falling finished into an age in many respects benighted, should always retain great influence, having been, in fact, the source of our civilization, and presenting models of excellence attained under the most favourable circumstances, in addition to the beauty of the idioms in which they are clothed. The Greek, in particular, is the most finely organized and most fully developed language with which we are yet acquainted. In consequence of these circumstances, this science has been, and still is, overrated, and often pursued with an exclusive and injurious preference, which is nourished by the present system of school instruction in Europe. The Germans, we believe, are at present the most devoted to philology—a consequence of the studiousness that distinguishes the country, and which arises itself from the restraints upon action, at least to a considerable degree. To conclude, with a few words of Wolf, "The exercise of the thoughts on languages (which involve much of what is highest and most profound in the operations of the mind), particularly on foreign languages, throws open the field of abstract inquiry, and excites to the study of the intellect. The thorough study of the written works of antiquity serves as a means for the vigorous development of the powers. All the powers of the mind are occupied by the explanation and emendation of these works. And what a fund of knowledge is afforded by the view which they present of the development of man and of society in ancient times! In ancient Greece, we find, what we search for in vain almost every where else, nations and states which possessed in their nature most of those qualities which conduce to perfect the character of man, a people of so lively and susceptible a spirit as to leave no field of action which presented itself untried, and who pursued, in this way, the path of improvement more independently of the nations around them, and for a longer period, than was possible in after times and under altered circumstances; who forgot the man so little in the citizen, that the civil institutions themselves aimed at the development of the human powers by general sacrifices; who, in fine, with an extreme sensibility for every thing noble and graceful in the arts, united such depth in scientific researches, that they have produced the first admirable masters in ideal speculation as well as the most beautiful works of art." This is the field presented to the student of philology.

PHILOMELA; in fabulous story, a daughter of Pandion, king of Athens, who was transformed into a nightingale. According to the fable, Progne, sister of Philomela, married the Thracian prince Tereus, by whom she had a son, Itys. When Itys had grown up, Tereus went to Athens, and, at the persuasion of his wife, took her sister with him on his return. On the way, Tereus violated her person, and, to conceal his crime, cut out her tongue. But Philomela made it known to Progne by means of some tapestry, on which she embroidered her story. To gratify their revenge, they murdered Itys, and served him up to his father. When he saw the remains of his son, he pursued them: but they invoked the gods for help, and they were all immediately transformed. Progne fled to the woods in the form of a nightingale, lamenting for Itys. Philomela mournfully uttered *Tereu*, under the form of a swallow, in broken chirpings, on account of the mutilation of her tongue; and Tereus, in the form of a lapwing, uttered a piercing *poo*, or *woo*. Another story makes Philomela the wife and the nightingale, and Progne the sister and the swallow.

PHILOPŒMEN, the last great military commander of the Greeks, was born at Megalopolis, in Arcadia, B. C. 253, and, after the early death of his father, was educated by Cassander, a noble Mantinæan. Two academical philosophers were his teachers, and instilled into him high principles of honour and patriotism. Disinclined to a life of study, and thirsting for enterprise, military glory was his ambition, and to that all his youthful exercises were directed. No sooner had he begun to bear arms, than he joined his countrymen in their incursions into the Spartan territories. When he was thirty years old, Cleomenes, king of Sparta, surprised Megalopolis by night, and Philopœmen, who had unsuccessfully endeavoured to repel him, covered the retreat of his fellow-citizens to Messene, at the extreme hazard of his own life. When Antigonus, king of Macedonia, came to the assistance of the Achæans against Cleomenes, Philopœmen joined him with the cavalry of his native place, and distinguished himself in the battle of Sellasia, in which the Spartans were totally defeated. Antigonus proposed to take him into his service; but Philopœmen would only consent to serve some years as a volunteer in so excellent a school of warfare, and, in that capacity, was engaged in the war in Crete. Returning with a high reputation, he received from the Achæans the command of their cavalry, which, under him, became formidable throughout all Greece. In a battle with the Ætolians and Eleans, he killed, with his own hand, the commander of the Elean cavalry, and thus decided the victory in his favour. In 210 B. C., he was appointed commander-in-chief of the forces of the Achæan league. After having reorganized the Achæan army, he led it into the field against Machanidas, tyrant of Sparta, who was advancing at the head of a powerful force, against Achaia. They encountered each other at Mantinea. After a hard struggle, Philopœmen killed Machanidas in single combat, and gained a complete victory. The Achæans perpetuated the memory of this achievement by the erection of a bronze statue in the temple of Delphi. When the Achæans had declared war against Nabis, a later Spartan tyrant, and Nabis had besieged Gythium, Philopœmen attacked him by sea, but was defeated. He then surprised the enemy's camp, advanced against Sparta, overthrew the forces of Nabis, and destroyed a great part of them. Nabis was soon after murdered, and Sparta was taken and pillaged by the Ætolians, against whom the inhabitants had risen, when Philopœmen arrived before the city with a small force. He took advantage of this emergency to prevail upon them to join the Achæan confederacy, 191. They were desirous of showing their gratitude to the restorer of peace by a present of 120 talents, but he refused to accept it. But the Spartans soon became dissatisfied, separated from the confederacy, and called in the Romans to their assistance. Philopœmen, as commander of the Achæans, declared war against Sparta. The Roman consul Fulvius endeavoured to mediate between the parties; but their ambassadors returned from Rome with an indecisive answer. Philopœmen, however, proceeded against Sparta, and demanded the surrender of the authors of the disturbances. Accompanied by the principal Spartans, they presented themselves in the Achæan camp; but, while the complaints were under examination, an affray took place between them and the Spartan exiles, in which the Achæans also engaged. Seventy-three Spartans were seized, and executed by Philopœmen, after a short trial. The city was consequently surrendered and treated by Philopœmen with the same rigours as if it had been taken by storm. He commanded the Spartans to destroy their walls, to dismiss their mercenaries, to admit the exiles, to expel the slaves who had been set free by the tyrants, and substitute the Achæan code for the laws of Lycurgus. The Romans, to whom they had recourse for protection, declared these conditions too severe, but added that they had no right to violate them. Soon after, however, the Roman senate, eager to humble the powerful Achæan confederacy, sent an embassy to induce it to soften their rigour. Philopœmen procured the rejection of this demand; but the Romans finally prevailed on the federal congress to admit Sparta again into the confederacy as an independent state. Hardly was this affair settled, when Messene revolted. Philopœmen, though broken by infirmity and disease, marched against the insurgents, and at first beat them back, but was afterwards attacked with such fury, that he was obliged to give way. Separated from his followers, and thrown from his horse, he fell, dangerously wounded on his head, into the hands of the enemy. He was carried in chains to Messene, where his appearance moved to tears many of the inhabitants who had fought under him, and on whom he had conferred benefits. To destroy this impression, the government caused him to be thrown into a subterraneous dungeon, and, the next morning, he was obliged to drink poison. When he received the cup, having been informed that his troops had saved themselves, he said, "That is enough for me; I die content;" and emptied it with a cheerful countenance. Thus died (B. C. 183) one of the greatest generals of Greece, whom the ancients compared to Hannibal and Scipio. His ashes were transported to his native city with great pomp; statues were raised to his memory in most of the Grecian cities, and a yearly offering was made at his tomb by the city of Megalopolis.

PHILOSOPHER'S STONE. See *Alchemy*.

PHILOSOPHY, Mental. Philosophy owes its name to the modesty of Pythagoras, who refused the title σοφος (wise), given to his predecessors, Thales, Pherecydes, &c., as too assuming, and contented himself with the simple appellation of φιλοσοφος (a friend or lover of wisdom). The term was afterwards commonly applied to men eminent for wisdom, as Socrates, Plato, Aristotle, and others.

I. *Idea and Object of Philosophy.* Various as the idea of philosophy may be, since it is the product of independent thinking, which necessarily leads to opposite views and opinions, its subjects are the same in the minds of all reflecting men, and are the most important which can occupy human thought—God, the world, man, and their relations in general. Its end is the highest knowledge which can be attained of these subjects. With reference to its subjects, Cicero called it the "science of things human and divine." Many modern philosophers have called it the "science of the fundamental truths of human knowledge," or the "science of the essence of things;" others the "science of ideas," believing that through them we come to the knowledge of the essence of things, and, as all ideas centre in the idea of the absolute, the "science of the absolute" (thus it is called by the school of Schelling). Considered with regard to its end, namely, the attainment of the knowledge of which we have spoken, and the intellectual action by which this end is to be effected, it has been designated as the "science of reason." To *philosophize*, therefore, means, to reflect intelligently on the most elevated subjects of human knowledge, and to represent clearly and coherently the ideas thus attained. The latter is required to constitute philosophy a science, which necessarily requires system. The middle ages called this science *sapientia sæcularis*, as contradistinguished to *theology*, or *revelation*, that is, the Christian religion, whose origin is referred immediately to God. The various views of the great aim of philosophy—the relation of the infinite to the finite, the absolute to the conditional, of man to nature, &c.—form the ground of the various philosophical systems, whose mutual connexion is shown by the history of philosophy.

II. *Division of Philosophy*. Philosophy may be divided into pure philosophy, or philosophy strictly so called, which forms general notions, and investigates the laws of the mind, and applied philosophy, which applies the results of the former to the subjects of experience. To the latter belong, for example, psychology, pedagogics (see *Pedagogue*), politics. Philosophy, properly so called, was generally divided by the ancients into *logic*, or *dialectics* (as the doctrine of the possibility, form, and method of philosophy); *physics* (at a later period *metaphysics*,) the science of the ultimate causes of all being; and *ethics*, the science of the moral nature and destiny of man. In modern times, the division of philosophy into theoretical and practical has been the most general. The theoretical or speculative philosophy was considered to have for its object the investigation of the highest truths respecting God, the world, nature and mind; the practical, their application. But it was soon seen how little the latter idea was adapted to the sciences comprehended under practical philosophy; and this was then defined to be the science of action, or of the moral nature of man in particular. Some, therefore, call theoretical philosophy the explanatory or illustrative philosophy, as it has for its object that which exists without our aid, and is the subject of our knowledge; while they term practical philosophy the *imperative*, or *preceptive*, as it gives precepts for the regulation of human action. Æsthetics (q. v.), which originated at a later period, has been considered, at times, as belonging to the practical, at times to the theoretical philosophy. Where philosophy confines itself merely to the knowledge of the action of the human mind, theoretical philosophy is the science of the laws of conceiving and knowing (æsthetics, in this case, as being the science of taste, or rather the science of the rules for judging of the beautiful, has been added to it), and practical philosophy the science of the laws of acting, or of lawful acting. But this view very easily sinks into *formalism*, by letting the objects of knowledge escape out of sight, while we reflect on its laws. At least, it will be acknowledged, that the science of the laws and criteria of knowledge is rather an introduction to theoretical philosophy than theoretical philosophy itself. Those who define the latter in the last-mentioned manner, consider logic and metaphysics as belonging to theoretical philosophy, ethics and natural law to practical. Finally, philosophy may also be divided, with reference to the three highest ideas of man,—the ideas of the true, of the good, and of the beautiful,—into theoretical, practical, and æsthetical philosophy.

III. *History of Philosophy* is the relation of the most important attempts to realize the ideas of philosophy, or, according to Tennemann, the pragmatical representation of the gradual development of philosophy as a science. It is of great value, as one of the most important branches of the history of human civilization, and from the aid which it affords to philosophical genius, because it presents the most important problems of philosophy in their true meaning, extent and connexion, illustrates the various philosophical systems, and affords a survey of the progress and aberrations of the human mind, which teaches the most instructive lessons. The history of philosophy is commonly divided into the ancient, middle, and modern. Some divide it into the Greek (including the Greek philosophy in the Roman empire) and the modern European. In this division, the philosophy of the middle ages forms, as is obvious, the transition. The first period begins with the Greek, because, though the disposition to philosophize is confined to no particular nation, but is inherent in all, so that every tribe forms philosophical notions as soon as its religious conceptions pass over into reflection, and its feelings into doubt, yet philosophy was first studied scientifically by the Greeks. The philosophic notions of the inhabitants of the East must be mentioned in such a history, principally as introductory, and with reference to their connexion with the Greek philosophy, in which many Oriental notions were incorporated. Tennemann characterizes the first period (that of the Greek and Roman philosophy) as the period of the free striving of reason for the knowledge of the ultimate causes of nature and liberty. It forms a whole in itself, which, to a certain degree, carries in it the germs of all the subsequent philosophies. The Greek mind elevated itself through poetry to philosophy. The theogonies, cosmogonies and gnomes formed the introduction to philosophy, and connected it with religion. In the first division of this period—the youth of philosophy, in which reflection was not yet systematized nor separated from poetry—inquirers strove to solve the question respecting the origin of nature and the original matter of the world; *a*. in the Ionian school (beginning with Thales, 610 B. C.), by reflection on nature and the origin of natural things, or the first existence; further, *b*. by imaginary conceptions, as in the case of Pythagoras and his school (the Italian); *c*. by the dialectical opposition of reason and experience in the Eleatic (q. v.) school; and, *d*. by the union of both in the atomic school. Socrates (about 422 B. C.) opposed the notions of the Sophists, which threatened to destroy moral principle, and turned his inquiries to the moral nature and destiny of man, in which many of his pupils followed him. Philosophy thus received quite a new direction, which was first made manifest in a systematic form by his pupils, particularly Plato and Aristotle. The second division of the first period begins, therefore, with Socrates and his pupils: *a*. Plato (the founder of the academy, and, *b*. Aristotle (the founder of the peripatetic school. It is characterized by a systematic striving to embrace all the objects of philosophy. Plato laid the foundation of a systematic philosophy;

Aristotle developed the system. The former was distinguished for the warmth and vividness of his conceptions; the latter aimed at cool and patient reflection on the nature of things. By the side of the academic and peripatetic schools, *c.* the Stoic school, founded by Zeno, and, *d.* the Epicurean placed themselves in opposition. All these systems were attacked by the sceptic school, founded by Pyrrho. (See *Scepticism.*) The other Socratic schools—*e.* the Cyrenaic, Megarean, Cynian, Elian and Eretrian—followed the practical direction of their master with more or less deviation and peculiarity. "We see here," says Schulze, speaking of this period, "the philosophic spirit, undertaking, with manly circumspection, the solution of philosophical problems and the philosophical investigation of all subjects important for mankind." For this reason the inquiries of this period into the grounds of human knowledge, are of so great importance. In the third division, the philosophic spirit appears, like an enfeebled old man, striving only to unite the conflicting parties (with the Eclectics, q. v.), or, in order to escape from scepticism, flying to mysticism (with the Alexandrians, q. v., and New Platonists, q. v., whose founder was Ammonius Saccas, 193 B. C.). The Romans propagated and fostered only the philosophy which they had received. (For more information respecting this period, see *Greek Literature*, and the articles on the different philosophers and sects.) 2. The history of the philosophy of the middle ages, from 800 to 1500, A. D., or of the scholastics shows the struggle of reason for philosophical knowledge, under the influence of a principle elevated above it, and given by the Christian revelation, or acting in the service of the church. (See *Scholastic Philosophy.*) The Arabians, the flourishing period of whose literature falls in the middle ages, only cultivated the Greek philosophy and some detached religious philosophemes. 3. The third period, which begins with the fifteenth century, is characterized, says Tenneman, by a freer, more independent spirit of inquiry, penetrating deeper and deeper into ultimate causes, and striving for a systematic union of knowledge. First, the scholastic philosophy was attacked by those who called to mind the ancient Greek philosophy in its original purity. After this struggle, new views were presented. Some built upon experience, as Bacon and Locke. Opposed to them, Descartes, with whom some begin modern philosophy, strove to establish it upon its own ground, by dialectic reasoning; passing over from doubt to dogmatism, and taking the consciousness of thought and existence (*cogito, ergo sum*) as the foundation of his philosophy, whence modern philosophy first received its direction towards idealism. Spinoza and Leibnitz pursued the trodden path of reflection; the latter in the way of idealism, the former in that of realism.

We intend now to give a brief sketch of the philosophy of Britain, Germany, and France. The celebrity of the German philosophy would seem to entitle it to an extended notice. But to give a satisfactory account of it would far exceed the limits of this work. The very explanation of the terminology of the German philosophers, which would be necessary to qualify an English reader to understand their systems, would occupy much more space than we can give to the whole of this article, so that we can barely touch upon some of the most prominent points of the subject.

British Philosophy. Modern philosophy in Britain must be dated from Bacon. In his *Novum Organum* (1620), he takes a path directly opposite to that universally followed in his time, and, instead of appealing by dialectics to the notions of the understanding, he attempts to restore knowledge by the aid of observation, through induction. He was not the founder of a sect; he did not deliver opinions; he taught modes of philosophizing; he did not attempt to discover new principles, but to render observation and experience the predominant character of philosophy. His services consist in his dethroning scholastic philosophy, directing the attention to nature and observation, and rejecting final causes from physical inquiries; yet he made some detached psychological remarks of great value. Bacon is the father of experimental or empirical philosophy. Hobbes, the friend of Bacon, a bold and profound thinker, was the founder of modern sensualism. Philosophy, according to him, is such a knowledge of effects or appearances as we acquire by true reasoning from the knowledge we have of their causes or generation, or such causes and generations as may be, from knowing first their effects. The object of philosophy is any body of which we can conceive any generation, or which is susceptible of composition or decomposition. It is therefore either natural or civil. All knowledge is derived from the sense by motion; thoughts are representations of the qualities of bodies without us; the cause of sense is the pressure of the external object on the organ of sense; what we call *sensible* qualities are nothing but motion, and can produce nothing but motion in us; imagination is nothing but decaying sense, and understanding is imagination raised by words or other voluntary signs. Besides sense and thought, and train of thoughts, the mind has no other motion. Whatever we imagine is finite; therefore there is no idea of any thing infinite. Reasoning is nothing but reckoning, that is, adding or subtracting. The passions are internal voluntary motions; when appetites and aversions, hopes and fears, arise alternately about the same thing, the whole sum of these motions is deliberation, and the last appetite or aversion in deliberation, is will, not the faculty, but the act of willing. (See Hobbes's *Human Nature*, 1650, and *Leviathan*, 1651.) From these principles Hobbes having concluded that right and wrong were unreal, because they are not perceived by the senses, Cudworth (Intellectual System of the Universe, 1678) endeavours to refute the doctrines of the sensual theory. He maintains that there are many objects of the mind which are not derived from the sense, and could be formed only by a faculty superior to sense; these are not fantastical (conceivable by the imagination), but only noematical. Cudworth was, in most points, a follower of Plato; his plastic nature, a vital and spiritual but unintelligent and necessary agent, created by the Deity for the execution of his purposes, is Plato's soul of the world; and he maintains the Platonic doctrine of innate ideas. Locke introduced into the study of the human mind the method of investigation, which had been pointed out by Bacon, and gave the first example of an ample enumeration of facts, collected and arranged for the purpose of legitimate generalization. Without meddling with physiological hypotheses or transcendental metaphysics, he seeks, "in a plain, historical method, to give an account of the ways in which the understanding attains the notions it has, for which," says he, "I shall appeal to every one's own experience and observation." This cautious empiricism has been little observed by those who have called themselves his disciples in Britain and France, and who, neglecting his method, have seized upon some unguarded expressions to build up systems of idealism (Berkeley), scepticism (Hume), or sensualism and materialism (the French philosophers and the Hartleian school). The true spirit of the Lockian philosophy was first revived in the Scotch school (Reid and Stewart). Rejecting innate ideas, Locke teaches that sensation and reflection are the only sources of knowledge, external objects furnishing the mind with the ideas of sensible qualities, and the mind furnishing the understanding with ideas of its own operations. Sensation convinces us of the existence of solid extended substance, and reflection of the existence of thinking ones, of the cause and nature of which two kinds of being we can know nothing. Perception is a communication between the mind and external objects carried on by means of images present to the mind; these he calls *ideas*, which he defines to be the immediate objects about which the mind is employed in thinking. Having treated at length of the origin, nature and qualities of ideas, he proceeds to consider the instrument by which men communicate their ideas to each other; and his remarks on this subject (Book iii., of Language) form the most valuable dogmatic part of his work. Knowledge is the perception of the agreement or disagreement of ideas, which consists in identity or diversity, relation, co-existence, and real existence. Of the existence of ourselves and of God we have intuitive knowledge, which is the immediate perception of the agreement or disagreement of ideas: demonstrative knowledge is the discovery of it by the intermediation of other ideas: and these two sorts of knowledge yield complete certainty. Sensitive knowledge leads to the belief of the existence of other beings, and carries with it a reasonable confidence. Judgment is a supposition or opinion of the agreement or disagreement of ideas, and supplies the want of knowledge. Its conclusions are only probable. The ethical consequences which had been deduced from the sensualist school of Hobbes, and from a partial view of the doctrines of Locke, led Berkeley, who was not less remarkable for the virtues of his character than for the acuteness of his philosophy, to the adoption of idealism (Theory of Vision, 1709; Principles of Human Knowledge, 1710; Alciphron, or the Minute Philosopher, 1732). His Theory of Vision, which is the most valuable part of his labours, and which is an important addition to the knowledge of mind, was the first exposition of the difference between the original and acquired perceptions of the eye, and now forms an essential part of the science of optics. His scheme of idealism was founded on the Lockian doctrine of ideas. Proceeding from the principle, that we are percipient of nothing but our own perceptions and ideas, and that all the objects of human knowledge are ideas of sensation or reflection existing in the mind itself, he comes to the conclusion that the existence of bodies out of a mind perceiving them, is not only impossible, and a contradiction in terms; but, were it possible, and even real, it were impossible we should ever know it. By thus "expelling matter out of nature," he thought we should get rid of the chief cause of all error in philosophy, and all infidelity in religion. Granting the premises of Berkeley, which were the commonly received philosophical views, at least in England, his conclusions could not be refuted; but it was reserved for Hume to trace out, by a vigorous and unshrinking logic, the legitimate consequences of the Cartesian and Lockian philosophy to their ultimate results, and thus, though unintentionally, by a sort of *reductio ad absurdum*, to produce the great metaphysical revolution, of which Reid and Kant were the first movers. This he did with such power of logic, acuteness and cogency of reasoning, boldness, precision, clearness, and elegance, that scepticism never appeared more formidable or more seducing than in his writings (Treatise of Human Nature, 1738, cast anew in the Inquiry concerning Human Understanding, 1748). After showing that all attempted demonstrations of the necessity of a cause to every new existence are fallacious and sophistical, Hume endeavours to prove that the proposition, whatever has a beginning has a cause, is not intuitively certain, but is derived only from custom and belief, and is rather an act of the sensitive than of the cogitative part of our nature. In this argument, he proceeds on the ground that all certainty arises from a comparison of ideas, and the discovery of their unalterable relations, which are resemblance, proportions in quantity and number, degrees of quality and contrariety, and none of which is implied in the proposition above stated. All the objects of knowledge are impressions and ideas; the former are our more lively perceptions, when we hear or see, love or hate, or desire or will; the latter are the less lively perceptions of which we are conscious when we reflect on the former, and are copies of impressions. The existence of these perceptions as objects of consciousness cannot be denied; but to admit the existence of a percipient being, the I, is to assume that of mind, which is no more an object of knowledge than matter. There can, therefore, be no objective knowledge; and we are reduced to consciousness, the phenomena of which it takes cognizance, and their subjective relations. Hume's system of scepticism is not scepticism antecedent to study and philosophy, but consequent to science and inquiry, holding the absolute fallaciousness of the mental faculties, bringing the senses themselves into dispute, and thus sapping the foundations of all knowledge, and rejecting the existence of God, a providence, and a future state. At about the same time, Hartley (q. v.) attempted to account for all the phenomena of the mind, by the single principle of the association of ideas, and for this principle by vibrations and vibratiuncles in the medullary substance of the brain. In connexion with this plan of materialism, he defended the doctrine of necessity, representing God as the only cause of all natural effects and all human actions. To the Hartleian school belong Priestley, Darwin, and Horne Tooke. The sceptical conclusions which Hume had irresistibly shown to be the result of the ideal system of philosophy, which had been received since the time of Descartes and Locke, led Reid (Inquiry into the Human Mind, 1764; On the Intellectual Powers, 1785) to the examination and refutation of that system itself. The Scotch school of philosophy, modest and perhaps timid in its pretensions, has the merit of having first strongly and largely inculcated the absolute necessity of admitting certain principles as the foundation of all reasoning, and as being the indispensable conditions of thought itself. The Kantian philosophy is only a modification of it. According to the Scotch philosophers, certain simple ideas are implied and involved in certain intuitive judgments of the mind; thus identity, cause, time, number, truth, certainty, probability, are ideas peculiar to a rational mind, and necessarily arise in the human understanding, when employed in the exercise of its different faculties. Reid, therefore, while he rejected the Cartesian theory of ideas or images in the mind being the only objects of thought, directed his inquiries to an analysis of the various powers and principles of our constitution, in order to discover the fundamental laws of belief, which form the groundwork of human knowledge. Though professing to build only on experience, he did not limit experience to the relations of sense and its objects. Without claiming for man more than a relative knowledge of existence, and restricting the science of mind to an observation of the fact of consciousness, he analyzed that fact into a greater number of more important elements than had been recognised in the sensualist school. He showed that phenomena are revealed in thought, which cannot be resolved into any modification of sense; that intelligence supposes principles, which, as the conditions of its activity, cannot be the result of its operations; and that the mind contains notions, which, as primitive, necessary and universal, are not to be explained as generalizations from the contingent and particular, about which alone our external experience is conversant. His enumeration of the faculties of the mind, which he does not, however, give as complete, comprises perception, memory, conception, abstraction, judgment, reason, taste, moral perception, consciousness. The representation of consciousness as a special faculty, when, in reality, it is the generic condition of all mental activity, was a pregnant error in Reid's philosophy;—while his doctrine of the immediate or intuitive knowledge of mind and matter, which involved the overthrow of the ideal system, and the scepticism (or rather *nihilism*) deduced from it, was an important step in the progress of philosophy. Stewart, with some deviations, followed in the track of his master; but Brown, while he adopted many of the principles of Reid, departed, in many points of fundamental importance, from his philosophy. He assumes the existence of primary intuitions of direct belief, which are not only necessary to reasoning, but to thought itself: all our conceptions imply the idea of form, which is derived from relation in space (co-existence), and of power, which is derived from relation in time (successive existence); cause is only the invariable antecedent, effect the invariable consequent, power the invariable antecedence, in any sequence of phenomena. All feelings and thoughts are the mind itself existing in certain states; consciousness is not a distinct faculty, but a general term for all the states of the mind. Mental (personal) identity is an intuitive law of thought, it being impossible to conceive of successive states but as modifications of the permanent being—the I. The different states are divided by Brown into the external states (sensations), produced by the presence of external objects, and the internal states, arising in consequence of preceding affections of the mind itself. The latter class is divided into intellectual states and emotions, which are all referrible to one generic susceptibility—suggestion (association of ideas). The laws of suggestion are resemblance, contrast, and nearness in time or place, which are all reducible to proximity. That capacity of suggestion which revives conceptions, Brown terms *simple suggestion*, and that which gives rise to feelings of relation, *relative suggestion*. To the former are reducible those mental states commonly called the faculties of conception, memory, imagination, and habit; to the latter, those of judgment, reasoning, and abstraction. But Brown's philosophy involves many radical inconsistencies, and would hardly deserve to be mentioned in so general a sketch, were it not remarkable as an open revolt against the Scotch system, at the moment the latter seemed to be developed with new power, and to acquire new authority on the European continent; and for the temporary popularity it possessed in Great Britain, and particularly in this country. While France and Germany have in recent times imbibed a new spirit of metaphysical inquiry, the science of mind has been entirely neglected in Great Britain, and all interest in psychological researches seems to be extinct in that country.

German Philosophy. To the remark already made, of the impracticability of giving a satisfactory view of German philosophy within the limits to which we are confined, we must add, that if any science requires to be studied in a spirit of candour, and with a sincere desire to understand its real merits (and what science can be properly studied without such a spirit?), it is intellectual philosophy, particularly German philosophy. Nothing is easier than to take a phrase or a passage relating to subjects beyond the reach of the senses (whether of a philosophical, religious, or poetical character), and turn it into ridicule. We would also remark, that, since German philosophy has of late years diverged with unprecedented rapidity in all directions, and system after system has been raised and overthrown, it has been often asked, What has been gained by it? Have the philosophers settled any of the mysteries which have always perplexed the mind of man; or have they acquired any clearer and deeper knowledge respecting the most important interests of human society, government, law, and the civil ties in general, on which they write so much? We answer, that the Germans have acquired, by their philosophy, a spirit of scientific liberty, unknown in other nations. Every nation and age has its task and condition. As yet it has not been the lot of Germany to enjoy the blessings of civil freedom, and the manly spirit which it generates; but the spirit which pervades the best German works on religion, on literature, on natural philosophy, may well challenge comparison. The spirit of system and independent thought, which German philosophy has infused into German literature, sometimes leads, indeed, to prolixity of exposition, and sometimes to extravagance of speculation; but these are small disadvantages compared with the benefit which it has conferred; and the whole tone of the literature proves, what we have had occasion to remark more than once already, that civil liberty alone is wanting to hold the Germans up to the world as a noble and manly nation. While we dwell on the good consequences which German philosophy has had on the spirit of inquiry, we are far from pretending that it has been productive of unmixed good, or that every system of German philosophy which has acquired distinction in its time, deserves its reputation. How often has a figurative expression been taken for a profound truth, and served as the basis of arguments and systems, which sink into nothing before a critical investigation, and to which nothing but the imagination of Germans could have given a short-lived existence! This unsoundness, which is found in many German systems, is owing, in a great degree, to the predominance of the speculative over the active life in that country. Free institutions would soon enable them to shake off the dreaminess of the closet, by rousing them to vigorous action on practical subjects. The ill repute in which German philosophy long stood with foreigners, is owing, partly, to the reckless independence with which most of the German philosophers have created and shaped their language according to their systems, so as to render its study particularly difficult for strangers; partly to the premature and partial applications which inferior talents have made of those systems to other branches of literature, and which have mostly been known sooner than the original system; partly to real extravagances; but greatly, also, to the difficulty of justly estimating so large and so new a department of literature. A German philosophy, properly so called, could not appear until German prose had received a certain degree of cultivation. As long as the German philosophers wrote chiefly in Latin, they confined themselves principally to the defence of the predominating philosophy of the time—e. g. the scholastic philosophy—or else attacked it (after the fifteenth century), but without establishing new systems. The proper German philosophy is distinguished by an incessant striving for a systematic character, and the deduction of scientific conclusions from the simplest and most comprehensive principles. It must be considered to begin with Leibnitz towards the end of the seventeenth century. Leibnitz endeavoured to deduce philosophical truth from necessary and innate ideas of reason, by the way of mathematical demonstration. This system he opposed to the sensualism of Locke. His doctrine of innate ideas, of the monads, of the pre-established harmony of the universe, his theodicea, furnished subjects of thought to the most thinking men of his time. His followers, in particular Wolf and Baumgarten, extended his system, about the time of Frederic the Great; and, by their endeavours to reduce philosophy to one principle, and by the precise formulas in which they carried on their demonstrations, the formal side of philosophical science gained very much. The fault of this system was, that it sought truth merely by the way of definitions and demonstrations, as in mathematics. Wolf's disciples carried this system almost to absurdity. Lambert, Ploucquet, Reimarus, and others, his followers, cultivated logic with great success. This school was followed by a period of eclectic philosophy, in which, however, the scepticism of Hume, the examination of the understanding by Locke, the psychological investigations of Feder, Garve, Mendelssohn, the works of Platner and Abbt, together with the revived interest for art and criticism, and not less the sentimentality which reigned in poetry as well as in religion, excited and directed the attention of the whole thinking world to the nature of their own souls, and prepared the way for the system of Immanuel Kant. (q. v.) With him begins the second period of German philosophy. He showed that, instead of inquiring what the world was in itself, we ought first to inquire how we perceive it. Thus he began to examine all the means which man possesses for the perception of the external world, and determined the laws according to which every organ operates, and the sphere to which it is limited. His criticism denied to reason the possibility of finding and proving any truth, without the sphere of consciousness and of physical phenomena. The theory of Kant was extended by his followers in many directions, yet not with the harmony and comprehensive judiciousness with which he united and arranged all the different kinds and objects of mental activity. The human mind, however, was not satisfied with learning only its own limits. The relation between its own notions and realities, was again endeavoured to be determined in different ways. Fichte rejected the idea of any such relation, by admitting the absolute existence only of the thinking individual, by which he considered even the objects of thought to be produced; he denied the reality of an exterior world. This system atoned for its exclusive character by the high standard to which this vigorous spirit raised the moral dignity of man. Between him and Kant stands Fries, in his *Neue Kritic der Vernunft;* he likewise was distinguished for the moral tendency of his philosophy. In opposition to Fichte, Schelling proceeds from the idea of the objective absolute (see *Objective*), and arrives at length at the idea of individual existence (the I), from which Fichte sets out. He begins a third period in the German philosophy with his doctrine of identity, in which he determines the relation between subject and object. To him, mind and nature are only manifestations of the Divine principle, and the knowledge of this identity between thought and outward existence rests on intellectual intuition. Oken has founded a natural philosophy on this system. Hegel[*] has sought to establish a strict idealism, on Schelling's principles, by considering the absolute as the understanding conceiving of itself, and makes three divisions in his philosophy,—logic, the philosophy of nature, and the philosophy of mind. Each of these systems has, at different periods, found many followers, who, with more or less success, have laboured to extend them in different directions. Krug has united all the principal doctrines of Kant systematically in his Transcendental Synthetics. Bardili considered all philosophy as resting on the idea of the absolute, which he found in the act of thinking; he, therefore, treated logic as a source of real knowledge. Wagner and Eschenmayer endeavoured to correct or to extend the doctrine of Schelling. Jacobi's doctrine on feeling and faith is of an original character. Schulze distinguished himself as an opponent of Reinhold by a limited scepticism, Platner by his aphorisms, and Herbart by his metaphysical fragments. In considering the many changes German philosophy has undergone in so short a time, we shall naturally feel inclined to reproach this mania for new systems; but the truth or error of any comprehensive view cannot be appreciated justly, until it is developed in a consistent form, and the more different systems can be compared, the more comprehensive and impartial will be our knowledge.

French Philosophy. Totally opposite to German philosophy is the modern French philosophy. While the former strives to explore the abysses of existence, and to comprehend the mysteries of human nature, and thus often loses itself in flights of imagination, the French, of late, have understood by *philosophy* little more than the critical investigation of those subjects which are comprehensible at first view, and have banished from philosophy all that cannot be grasped by the plainest common sense; and so far have they carried this system, that at one time it proved most dangerous to morality, the original principles of which are by no means susceptible of such plain and simple demonstration as was required by the French school; and we have little doubt that, to this day *sensualism*, or the French philosophy, founded on Condillac's system, produces fatal effects. So much, indeed, do the French and Germans differ, that what the former call *philosophy* and *metaphysics* is, in fact, totally different from that which the latter designate by the same terms. It is also very characteristic of the French people, that their modern philosophy may be said to have unfolded itself in fashionable society. Towards the end of the seventeenth century, a tone of light philosophy was introduced into polite circles, in opposition to the affected morality then in vogue, which, however, had some connexion with the old romantic spirit. Both systems had adherents in the world of fashion, under the patronage of ladies: at the head of one party was the *spirituel* Ninon de l'Enclos, with her philosophizing friend St Evremond; at the head of the other, the amiable marchioness de Sevigné. Both the circles acquired literary celebrity; language attained the highest refinement, and conversation its greatest perfection; but the consequence was, that a conversational tone was given to literature. Descartes (q. v.), Arnauld (q. v.), (to whom is ascribed the *Art de Penser*), Nicole, De la Forge, and the deep-thinking Malebranche (q. v.), belong to another time. The direction which modern French philosophy has taken, originated from the English philosopher Locke. (q. v.) On the doctrines of this acute reasoner a system of sensualism was founded by Etienne Bonnot de Condillac (born 1715, died 1780). He taught that the basis, the principle of all that is developed in our mind, is sensation (*la faculté de sentir*). All ideas, knowledge, faculties, even reflection, actions and customs, are successive transformations of this principle. The sensation only changes its form, as the ice when it is dissolved into water, and evaporated in vapour." (See *Condillac.*) The simplicity of his method, and the clearness of his exposition, awakened the greatest interest. He became the leader of a school still predominating in France. The Encyclopædists (see *Encyclopédie, the French*) contributed most to its propagation, particularly Diderot, D'Alembert and Helvetius. The effect was striking: the most difficult of all sciences, which requires the deepest study and the most persevering reflection, was brought within the reach of the multitude; every one could talk about metaphysics. But it was overlooked that this system did not lead men a step nearer to the solution of the highest and most important problems. The system was carried farther and farther, not always in accordance with the views of the author, but according to the direction given by him. Sensation (the lowest degree of intellectual action, and that in which we are most dependent upon the external world) being now considered the essential principle in all the operations of the mind, the distinction between sensation and perception which Locke had made, being rejected, and man being regarded only as an animal of a somewhat finer organization than the others, but moved only by sensual impulses (as in the system of Helvetius), the consequence was, that the material world was considered as the only form of existence, mind as only a connexion of atoms, the basis of its actions egotism, and the end of these actions a refined sensuality; thence the belief in moral freedom, virtue, God, providence and immortality, was looked upon as a folly unworthy of a reflecting mind, and a complete materialism became predominant. We have said that Condillac's system continues to predominate in France; still, however, several distinguished philosophers follow another path, and we are far from asserting that the consequences which we have ascribed to the system still exist in their full extent. It may be safely said, that there prevails in France, at present, a deep-felt want of the belief in a God, which not being able to find satisfaction in the dogmas of the Catholic church, the religion of the overwhelming majority is in an unsettled state. Of this want, even the propagation of the extravagant doctrines of the *St Simonians*, which would be otherwise inconceivable, is a strong proof. But there are still more persons in France whose minds are unilluminated by a belief in immortality, than in any other civilized nation. The acute understanding and inexhaustible wit of Voltaire, the clear intellect of D'Alembert, at the head of the Encyclopædists, spread through society the dangerous doctrines just mentioned. Rousseau's enthusiasm stands alone in the French literature of that time. The revolution, which produced so great a change in the character of the French, and made them more acquainted with foreign nations than their national pride had allowed, especially with the Germans, had also considerable influence upon their philosophy. The want of a deeper, more earnest philosophy, is apparent even in Rousseau's works; still more in those of St Pierre, Châteaubriand, Claude St Martin, and the marquis Bonald; also Prosper de Barante, in his work on the literature of France in the eighteeenth century, was actuated by this idea; and De Gerando, Villers, and the baroness de Staël-Holstein, from the same feeling, have directed attention to German philosophy. Among those who have attempted to give philosophy a better character, Laromiguière is distinguished. His *Leçons de Philosophie, ou Essai sur les Facultés de l'Ame* (2d ed., Paris, 1820, 2 vols.), is valuable. He opposes the doctrine of Condillac, as to the first and sole principle. He stands nearer to Locke than to Condillac. Count Destutt de Tracy has become well known by his *Idéologie* (3d edit., Paris, 1817). Locke and Condillac are his idols. He extends somewhat the principle of Condillac, and considers sensations as predicable not only of the objects of the external world, but also of those of the inner. Ch. Vict. de Bonstetten's *Etudes de l' Homme* (Geneva, 1821, 2 vols.) is a valuable work, written in the spirit of the higher psychology, but more in the shape of sketches and hints than of a methodical system. Bonstetten strives particularly to defend the emotions of the heart, the feelings, against the coldness of logicians, who derive all the operations of the mind from ideas only. We must mention also De Gerando, whose *Hist. comparée des Systèmes de la Philosophie* (Paris, 1804, 3 vols.) lately appeared in a new edition. Victor Cousin has opened a new path. He approaches the German philosophy. (See his article.) His introductory *Cours de Philosophie* has lately been very well translated into English by Mr Linberg (Boston, 1832, 1 vol.) We ought to mention, also, the works of St Simon, as among the modern works which have attracted most attention. (See *St Simon.*) We shall conclude our remarks with a passage of the article *Philosophie*, from the *Encyclopédie Moderne*: "France cannot be said, at present, to have any system of intellectual philosophy properly its own. Fluctuating between the spiritualism of Germany, which rejects empiricism, and the views of the Scotch school, which admits the authority of experience, it adopts some views from each, whence results a sort of eclecticism, favourable at least to investigation, even if it is not, in all its parts, conformable to truth."

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[*] He died in Berlin, in the winter of 1831—2, of the cholera.

For the Italian philosophers of the middle ages, see *Italy*, division *Italian Literature*. There is no school of modern Italian philosophy. For a complete history of philosophy, we refer to Tennemann's *History of Philosophy* (in German; Leipsic, 1798—1810, 18 vols., in large octavo), of which a synopsis has been also published, and a translation of the latter, by Vict. Cousin (Paris, 1829, 2 vols., 8vo); also to Ritter's *History of Philosophy* (in German), recently published.

PHILOSOPHY, NATURAL, OR PHYSICS (*physica, physice*, from φυσις, nature), is that branch of science which treats of the laws and properties of matter. *Natural history* (q. v.) describes the external characters and appearances of natural objects, while *chemistry* (q. v.) separates them into their elements, and explains the modes of the composition and mutual action of these elements upon each other: *natural philosophy*, on the other hand, deals with matter in its integrant forms, and points out those properties which belong universally to matter, and those laws whose operation is implied in the very definition of the term *matter*. It therefore comprises astronomy (q. v.), which explains the causes that keep in motion, and bind in fixed orbits, the great train of worlds and systems of worlds composing the universe; mechanics (q. v.), in its different divisions (see *Acoustics, Hydraulics, Hydrostatics, Pneumatics*); optics (q. v.), or the science which explains the motions and laws of light; the laws of heat, electricity and magnetism, except in regard to their chemical properties, also fall within the jurisdiction of natural philosophy. In respect to the method of investigation, it is sometimes by mathematical calculation, and sometimes by observation (experimental philosophy); but these two instruments of truth are more commonly united in illustrating and confirming each other's results than employed in distinct departments of research. In regard to the theory of matter (q. v.), natural philosophers are at present divided, the one school maintaining that all bodies are composed of continuous matter, the different states of which are owing to the contending action of two opposite powers, expansion and attraction; the other, that matter is composed of minute particles, or atoms of unchangeable forms, which primitive forms produce particular modifications of the natural powers. (See *Dynamic Theory.*) The Egyptians, Chaldeans and Phœnicians were, in the earliest periods, celebrated for their knowledge of mechanical, chemical, astronomical and physical science. Among the Greeks, Thales, the founder of the Ionic school, was the first who separated natural philosophy from allegory and fable; but the later Greek philosophers again carried natural science backward, by indulging in metaphysical speculations in their studies of nature. Plato and Aristotle are the most distinguished of this class, although the writings of the latter are less faulty in this respect than those of the former. Pythagoras taught that certain monads were the final causes of the phenomena of matter. His school, however, had some indistinct conceptions of the Copernican system. The atomic theories of Leucippus and Democritus made near approaches to the atomic theory of the present day. The works of Theophrastus, Hippocrates, with the writings of Aristotle, on physical subjects, show that the Greeks, notwithstanding their speculative turn of mind, did not entirely neglect observation. Among the Romans Lucretius is distinguished by his poem *De Rerum Natura*; Seneca, by his *Quæstiones Naturales*, and Pliny, by his *Historia Naturalis*. In the middle ages, natural science was involved in a deep darkness, rendered still more impenetrable by the clouds of scholastic philosophy. Among the Arabs, however, it was not entirely neglected. Francis Bacon (q. v.) first dissipated this night by the light of a sounder method of investigation, founded on observation (in his *Novum Organum*). At about the same time, Galilei (q. v.) discovered the laws of the fall of heavy bodies, and of the pendulum, and Torricelli invented the barometer. Kepler explained the laws of the motions of the heavenly bodies, and, by happy applications of geometry, laid the foundation of optics. Otto von Guericke invented the air-pump, and Descartes now found it easy to pull down the tottering fabric of the physics of the schools. (See *Scholastic Philosophy.*) While he was attempting to substitute a better metaphysical foundation for natural science, Boyle and Hooke in England, Borelli and Grimaldi in Italy, and Pascal, Mariotte and Picard in France, successfully cultivated experimental physics; the royal society was instituted in London, the academy of science in Paris, and the Accademia del Cimento in Florence; and these institutions had a powerful and happy influence on the progress of physical studies. Finally appeared Newton (q. v.), who by his *Philosophiæ Naturalis Principia Mathematica* (1687), became the founder of modern natural philosophy in all its brilliancy. We cannot follow it in its splendid course, and can only allude in general to the improvements of the thermometer, the discovery of the gases, the discoveries in electricity, particularly of the lightning-rod and of galvanism (q. v.), the substitution of oxygen, by Lavoisier, to the phlogiston of Stahl, the reduction of the alkalies and earths, the discovery of iodine and chlorine, of the polarization of light, of the connexions between electricity and magnetism, &c., which are more particularly treated of under separate articles. The uses of the study of natural philosophy are too obvious to require mention, since our comfort and safety depend upon a knowledge of the powers and properties of bodies; and a right study of nature not only dispels a thousand superstitions, but affords a most striking proof of the existence of an intelligent government of the universe. (See Herschel's admirable *Discourse on the Objects, Advantages and Pleasures of the Study of Natural Philosophy*, in Lardner's Cabinet Cyclopædia.) Among the best works on the history of natural philosophy, are Fischer's History of Physics since the Revival of Letters (in German, Gottingen, 1801, 6 vols.), and Playfair's Dissertation on the Progress of Mathematical and Physical Science since the Revival of Letters, prefixed to the Encyclop. Britannica, and continued by Leslie. On the method of observation in experimental physics, Senebeir's *Essai sur l'Art d'observer et faire des Expériences* (3 vols., Geneva, 1802) deserves to be consulted; and, in connexion with it, Sigaud de la Fond's *Description et Usage d'un Cabinet de Physique Expérimentale* (Tours, 1796, 2 vols.); Biot's *Traité de Physique Expérimentale et Mathématique* (4 vols., 8vo), is the most complete manual. There is an excellent abridgment of this work by the author, *Precis élémentaire de Physique Expérimentale* (3d ed., 1824, 2 vols., 8vo). Arnott's Elements of Physics is a good popular treatise.

PHILOSOPHY, PERIPATETIC. See *Peripatetic Philosophy.*

PHILTRE; a love potion. From the earliest it has been supposed that there were means by which love could not only be excited, but be directed to a particular object. Various substances, from the animal and vegetable kingdoms, have been used for this purpose, some disgusting, some injurious, some without any distinguishing character. The truth is, that physical desire may be produced by physical stimuli, which are called *aphrodisiacs*, but it is absurd to suppose that such means can produce a passion for a particular object.

PHIPPS. See *Mulgrave.*

PHIPS, SIR WILLIAM, governor of Massachusetts was born at Pemaquid, Feb. 2, 1650. He was one of twenty-six children, twenty-one of whom were sons. His father died when he was a child. He then bound himself to a ship carpenter, and, in due time, engaged in the business on his own account. He was so illiterate as not to be able to read or write; but he soon acquired knowledge sufficient for the purposes of common life, and was fortunate enough to connect himself, by marriage, with a young widow of a respectable family. In 1683, he sailed from England, in search of a Spanish vessel which had been wrecked near the Bahamas, having gone to the mother country on hearing of the circumstance, and solicited means for the expedition. He was supplied with two frigates by the admiralty, but failed of success. Nothing discouraged, however, he made fresh importunities for the means of making a second attempt, which were given to him by the duke of Albemarle. He discovered the wreck, and brought from it £300,000, £16,000 of which were appropriated to his share. He was also knighted by the king, and appointed high-sheriff of New England. After residing for a time, in that capacity, at Boston, he returned to England in consequence of some disagreement with two other functionaries, by which his situation was rendered uncomfortable. In 1690, he captured Port Royal, but was not so fortunate in the expedition against Quebec. In the same year, he was chosen by the freemen a magistrate of the colony. He did not remain long in Boston, but repaired to England to solicit an expedition to Canada. At that time, the agents of Massachusetts were soliciting a restoration of their old charter from king William; but this being refused, and a new one given, Sir William was appointed captain-general and governor in-chief of the province. He discharged the duties of his office with fidelity. His impetuous temper, however, sometimes involved him in quarrels, and complaints were made against him, which he was sent for to answer. He justified himself, and was about to return to his government, when he was taken sick, and died in London, about the middle of February, 1694. He was a blunt, honest man, ardent in every thing which he undertook, open-hearted and generous, but vulgar in speech and manners. His talents were considerable.

PHLEBOTOMY; the act of letting blood by opening a vein. Among the ancients, great regard was had to the place where the opening was to be made. At present, the custom is to open one of the principal veins of the arm, the hand, the foot, the neck, or the tongue. The operation itself was anciently performed with a spring lancet; now, for the most part, with a simple lancet. Of the arteries, that of the temples is the only one which is opened, and that is done in cases of local complaints of the head. Another mode of letting blood is by cupping, or by the application of leeches for the purpose of extracting blood from places affected by inflammations. Phlebotomy is one of the most effectual means of the medical art; but its application is differently regarded by the most distinguished physicians. Hippocrates rarely resorted to it; for he considered the cure of fevers and inflammations as the work of nature, and regarded phlebotomy as a mode of weakening the efficacy of her operations. His followers applied it more frequently, sometimes even to excess. The schools of the empirics (250 B.C.) relying, like Hippocrates, on their own experience and on the observation of nature, endeavoured to determine the cases in which bleeding was indispensable. But medicine declined with the general decline of science. Greek physicians indeed still distinguished themselves among the Romans; but the sect of empirics had degenerated. Excessive bleeding again became common, until Asclepiades of Bithynia (Cicero's physician and friend) taught a new method of phlebotomy. He considered the cause of the greatest number of diseases to be redundance of blood, and, on this account, advocated the practice of bleeding, but principally for the alleviation of pain, and applied this remedy frequently in case of local affections. After him Celsus gave an account of the cases in which bleeding was necessary (A. D. 5), and his remarks and directions correspond exactly with those of the greatest modern practitioners. Aretæus, founder of a new school (A. D. 70), prescribed bleeding more frequently in acute than in chronic diseases, and, in extreme cases, he bled the patient to complete exhaustion. Galen (160), who referred the origin of a large class of diseases to excess of blood, ordered copious bleedings; and this practice gained great repute, and prevailed for several centuries. After the fall of the Roman empire, physicians were so scarce in Europe, that Charlemagne died of an inflammation of the lungs, for want of bleeding and medical attendance. The Arabian physicians followed the authority of Galen, and spread his doctrine over Spain, Italy and France. Bleeding was still more generally practised by the monks, who were in the sole possession of medicine, as well as of all other science, in those ages. At a later period, astrology was connected with the medical art, and bleedings were prescribed on certain days. The popes, indeed, had often forbidden the monks to practise medicine; but they either disregarded the orders, or considered them as referring only to surgical operations. Thus surgery began to be separated from medicine, and formed a new profession, including the art of bleeding, applying leeches, and shaving. But when, after the invention of printing, the writings of the physicians of Greece, especially of Hippocrates, began to circulate, and their doctrines to revive, the practice of bleeding, at least among physicians, was again confined to certain cases. In Germany, Paracelsus (1525) overturned the system of Galen, and with it the practice of bleeding, which is now confined to the surgeons and barbers alone. In France, Italy, &c., the method of Hippocrates and the degenerated system of Galen were, however, not yet abandoned, and the practice of bleeding was carried to the greatest excess. Helmont (1600), the founder of a new system, doubted the use of extracting blood, alleging against it, that it weakened too much the vital spirit, which he called *archæus*. Harvey's discovery of the circulation of the blood (1619) had some influence on the modes of phlebotomy, in as far as it led to experiments (1642) by which medicines were infused immediately into the veins, or a portion of the infected blood extracted, and supplied by the blood of healthy men or animals. In England, Sydenham rose (1673), who thought it possible to expel diseases by copious bleedings. He extracted blood in almost all cases, never less than eight ounces, generally ten or more, and, in cases of inflammation, as much as forty ounces. The pernicious consequences of this practice did not escape him, but he thought he could not subdue disease by any other means. Stahl (1707) attempted to unite the system of Hippocrates with that of Helmont, and established correct and moderate principles of phlebotomy. He taught that abundance of blood was no disease, but might become so by a disproportion created between the solid and fluid parts of the system, in which case the proper balance ought to be restored. But he found bleeding indispensable, in cases of too great excitement succeeded by a congestion or effusion of blood. To prevent this, he prescribed occasional bleeding. His method was soon misunderstood and misapplied. The extraction of blood for the preservation of health was every where thought necessary. Bordeu endeavoured to stop this abuse in France. Cullen (1777), who regarded all diseases as proceeding from an unnatural state of the nerves; all irregularities of the fluids as the consequences of weakness and spasm, recommended bleeding as the best means to diminish the activity of the whole body, and especially of the system of the blood-vessels. He recommended, however a due regard to circumstances, and mainly adopted Stahl's doctrine of the superabundance of blood. Stoll of Vienna (1780), an admirer of Sydenham, resorted frequently to bleeding. Several of the later physicians sought, however, to limit its too frequent application. Wollstein (1791) recommended it only in a few cases. Gall, also, improved the system still more. Brown adhered to the same maxim, and limited the practice of bleeding too much. In modern times, the abuses of phlebotomy have again considerably increased, because the antiphlogistic method of healing has risen into great repute. Bleeding is one of the most effectual, but also one of the most dangerous means of checking disease.

PHLEGETHON (φλεγέθων, burning), in the Grecian mythology; a river of fire in the infernal regions. See *Cocytus*.

PHLEGREAN FIELDS; a place in Macedonia, where the battle of the giants was said to have taken place. The name was also applied to a place near Naples (*Forum Vulcani*, *Solfatara*), where the ground is impregnated with sulphur. See *Giants*, and *Naples*.

PHLOGISTICATED AIR; nitrogen, or azote. See *Nitrogen*.

PHLOGISTON; the supposed general inflammable principle of Stahl. See *Oxygen*, and *Combustion*; also *Chemistry*.

PHOCAS'S COLUMN. See *Column*.

PHOCION; an Athenian general, and one of the most virtuous characters of antiquity. Though of humble descent, he received a good education, and imbibed, under Plato and other philosophers, those elevated sentiments which governed his whole life. His external appearance was stern and severe, but his disposition was mild and gentle. His eloquence was distinguished for clearness and brevity; and his opinion was pronounced in the assemblies of the people, freely and without hesitation. He first served under Chabrias, an officer of merit, but of a violent and unequal character. He gained his esteem and moderated his impetuosity. His activity contributed essentially to the naval victory of Naxos (377 B. C.), and he afterwards collected, with great prudence, the taxes of the islands. In the war with Philip of Macedon, the Athenians sent Phocion with some troops to Eubœa, in hopes to introduce the inhabitants to form a junction with him. The gold of Philip rendered this project abortive, and Phocion was obliged to retire, with his troops, to an eminence for security. The enemy surrounded him, and made preparations for attack. Reduced to despair, Phocion made an onset, and gained a complete victory. Before the battle, he gave permission to all who desired it, to retire; and, after the battle, he liberated the prisoners, to save them from the fury of the Athenians. His conduct was marked with prudence, boldness and manliness. He banished Plutarchus, who had made himself tyrant of Eretria, and left the island secure from the attacks of Philip. Some time after, the Athenians resolved to yield assistance to the cities of the Hellespont, threatened by Philip, and the command of the fleet was intrusted to Phocion. The inhabitants of Byzantium received him, and he not only saved their city, but compelled Philip to retire from the Hellespont. Notwithstanding their success, Phocion always advised peace. His honesty, disinterestedness and patriotism were so generally acknowledged, that he was nominated commander forty-five times, without once applying for the office. He always led a simple life, and cultivated his small farm with his own hands. When the inhabitants of Megara requested an alliance with the Athenians, Phocion zealously advocated the measure, marched to the city at the head of a large body of volunteers, and rebuilt the walls. When Philip appeared in Phocis, with a view to attack Attica, Phocion in vain advised peace. The battle of Chæronea (A. C. 338) proved the justness of his opinion. The Athenians disregarded the advice of Phocion, not to take part in the assembly of the Grecian states, convened by Philip, till they knew the intentions of the king; and, in consequence, found themselves obliged to furnish Philip with a quota of cavalry and galleys. This they were reluctant to do, but Phocion advised them to submit to adversity with patience. After Philip's death, Phocion advised the Athenians not to expose themselves to new disasters by joining a confederacy against the young Alexander. His opinion was justified by the event. When, after the destruction of Thebes, Alexander demanded of the Athenians the deliverance of the orators who had spoken so violently against him, Phocion undertook the commission of appeasing the anger of the king with the happiest success. Alexander conceived a great affection for him, and sent him a present of a hundred talents, which he declined. The deputies found him carrying water, while his wife was baking bread. But, not to displease the king, he requested the liberation of some of his imprisoned friends. After Alexander's death, the project was formed of freeing Greece from the Macedonian yoke. Phocion disapproved the measure, though he accepted the command. The Athenians were at first successful; but Antipater soon obtained the superiority, and threatened Athens, which was instantly abandoned by the orators who had been so clamorous for war. In this pressing danger, Phocion was sent ambassador to Antipater, who was encamped in the territory of Thebes, and obtained, on hard terms indeed, a promise that he would conclude a treaty without entering the territory of Attica. The terms were, that Demosthenes and Hyperides should be given up, an aristocratical government formed, and a Macedonian garrison introduced into Munychia. This last condition was long opposed by Phocion, but Antipater was inflexible. Under these hard circumstances, all the efforts of Phocion (who, with other distinguished men, was then at the head of government), were directed to mitigate the heavy burdens of his country, and to turn his influence with the Macedonians to its advantage. Nevertheless, Phocion was accused of having acted against the good of his country, and of having betrayed it to the enemy. He was compelled by clamours and accusations, to take refuge in Phocis, with Polysperchon, who soon after delivered him and other refugees to the Athenians, who demanded them. Polysperchon also sent a letter to the city, acknowledging them to be guilty of treachery. Their trial took place before the assembly of the people. Phocion, with several of his friends, was condemned to death unheard. His calmness continued unshaken. "Tell my son," said he to a friend, who asked if he had any commission for him, "to forget that the Athenians have been unjust to me." When many had drank the fatal draught, it was observed, that there was not enough remaining for the rest, and the officer who administered it refused to procure more without pay. Phocion requested a friend to pay him, and said jestingly, "It is not even allowed us to die gratis in Athens." His body was thrown, unburied, beyond the limits of Athens, but his friends carried it to Eleusis, and burnt it in the house of a Megareusian woman. The Athenians became sensible of their injustice: they procured his remains, buried them at the public expense, erected a monument to his memory, and punished his accusers.

PHOCIS; a district of Greece, bounded north by Thessaly, east by Locris and Bœotia, south by the bay of Corinth, and west by Doris and the country of the Ozolian Locrians. The principal rivers were the Cephissus and Plistus, and the principal mountain Parnassus. Phocis was the country of the Hellenes. Parnassus, son of Neptune, built Delphi, before the flood of Deucalion, and gave his name to the mountain. After the destruction of Delphi by this flood, the surviving inhabitants built, on Parnassus, a city called Lycorea, where Deucalion reigned. Their posterity spread to the north, and conquered the Pelasgians, who dwelt there. At this time arose the name of *Hellenes*. Several small kingdoms were erected. Among others, Phocus, son of Ægeus, conducted thither an Æginetic colony, and from him the whole country took its name, *Phocis*. In later times the constitution was probably democratic. The Phocensians were an industrious people, and subsisted chiefly by agriculture. They were distinguished for their bravery, of which they gave a signal proof in the war with the Thessalians, and in the Persian and Peloponnesian wars, in which last they took part as allies of the Spartans. They were the cause of the sacred war, so destructive to Greece, and shared the general fate of their countrymen, after the battle of Chæronea, B. C. 338. See *Greece*.

PHŒNICIA, which is often considered as a part of Syria, was a narrow strip of land on the Mediterranean, extending from Aradus on the Eleutherus to Tyre on the Leontes. Several towns on the coast, still farther south, within the limits of Palestine, may also have belonged to it; on which account, Ptolemy extended the southern limits to the Chorseus. This district, containing not more than 4238 square miles, was sandy, and was divided by the woody ridges of Lebanon, and Anti-Libanus. It contained, in its most flourishing times, a great number of considerable cities, but never formed a single state. The oldest city was called *Sidon*, now *Saida*, which was distinguished for its manufactures, especially of glass. Tyre, a colony of Sidon, was principally distinguished for its purple. This city received the name of *old Tyre* when the later celebrated Tyre was built on a neighbouring island, which Alexander, during his siege of the city, converted into a peninsula. Byblus (now Gebele, or Esbele) was celebrated for the worship of Adonis. Aco, afterwards Ptolemais, is now Acre; Berytus was afterwards distinguished for a law-school. These, and other cities, were at first colonies, dependent on the metropolis; but they became independent, and, in their flourishing period (B. C. 1000—600), formed a confederacy, at the head of which was Tyre. The original inhabitants of Phœnicia were probably nomads, who roamed about the shores of the Arabian and Persian gulfs; thence they went to Palestine, from which they retired into the country of their subsequent residence, long before the arrival of the Israelites, in consequence of the attacks of some powerful tribe. The maritime position of their new country, and its abundance of wood, led them to fishing and ship-building. Favoured by circumstances, the Phœnicians became a seafaring people, engaged sometimes in piracy, and sometimes in commerce. The imperfect accounts still existing prove that this was the case very early. Sidon is called by Moses the first born son of Canaan. The colonies which emigrated about the year 1500, in the time of Agenor, to Asia Minor, Crete, Lybia, and Greece, diffused various kinds of knowledge. Cadmus, his son, introduced into Greece the first notions of civil society and of writing. At the time of the settlement of the Jews in Palestine, about 1440, Sidon is called the *great city*. Homer mentions it as distinguished above all cities for its manufactures. As early as the twelfth century before Christ, the inhabitants of Sidon founded colonies in Africa. Utica was founded about 1170 B. C., and in Solomon's time, voyages to Tarshish, on the south-west coast of Spain, were common, from which we may have an idea of the extent of the Phœnician trade and commerce. Safe and neighbouring harbours must, therefore, have been of importance to the Sidonians. On this account they built houses around a natural harbour, and erected a castle (Zor) on a rock. Numbers gradually settled here, and if, with Josephus and Trogus Pompeius, we believe that Tyre was built about 1184, then we must suppose that at this time it received a large colony, which converted the fortress into a city. In a short time, the little town grew so important, that, from 1000 to about 600 B. C. it was the head of the Phœnician confederacy, as Sidon had previously been. They had not power to carry on foreign wars, and they had no occasion for defence; they sought to extend their dominion by the peaceful colonization of uninhabited countries, and by alliances. We hear first of the Tyrians being engaged in wars on account of the attacks of the Asiatic conquerors, who were allured by their riches; these they carried on with mercenary troops. About the year 1000, Hiram, son of Abibal, concluded treaties of commerce and friendship with David and Solomon. Ithobal, king of Tyre and Sidon, about 900 B. C., was the father of Jezabel. He built several cities in Phœnicia, and peopled Auza, in Africa. To his son, Badezor, succeeded Mutgo (Muttinus or Mutgenus), father of Pygmalion, Barca, Dido and Anna. Dido, on account of a dispute with Pygmalion (B. C. 888), fled with Barca and Anna, and founded Carthage. (q. v., and *Dido*.) The neighbouring island Cyprus must have been then under the dominion of the Tyrians, for Pygmalion here built Carpasia. Tyre must have subsequently maintained its superiority over the Phœnician cities, and probably abused it, for we find that the Cytheans of Cyprus revolted under the conduct of Elulæus (about B. C. 700), and called the Assyrians to their aid. Elulæus, however, again submitted, and Salmanassar concluded peace. On this, Sidon, and many other Tyrian cities, revolted and submitted to Salmanassar, whom they supplied with ships. But the hostile fleet of sixty vessels was destroyed by a Tyrian squadron containing only twelve, and the Assyrians were obliged after five years to raise the siege of Tyre. Thus Tyre remained 100 years superior to the Israelites. In the mean time, Sidon appears to have again risen, and to have become independent of Tyre. The alliance with Zedekiah against Nebuchadnezzar proved fatal to them. Sidon was destroyed; Tyre was taken, after a thirteen years' siege, and never recovered its former greatness. Most of the inhabitants fled with their treasures to the insular Tyre, which now became the centre of the commerce of the world. Itobal, who perished in this siege, was succeeded by Baal, who was probably a vassal of Babylon. During the seven years after his death, *suffetes* were chosen by the people. The government was afterwards again administered by kings subject to the Babylonian sovereignty. In the time of Cyrus. (B. C. 555), Tyre, and probably all Phœnicia, fell under the Persian yoke. The kings of Tyre and Sidon, Mapenus and Tetramnestus, are mentioned as the most experienced seamen in the fleet of Xerxes, at the battle of Salamis, about B. C. 481. Sidon was at this time the richest city of Phœnicia, and was at the head of the insurrection against Artaxerxes, Mnemon and Ochus. Tennes, king of Sidon, assisted by the Greeks and Mentor, defeated (B. C. 361) the Persians; but Ochus appearing with a formidable force, and the city, though strongly fortified, having fallen into his hands, by the treachery of Tennes, the Sidonians, in despair (B. C. 350), burned themselves and their property. Other Sidonians, who were absent at this time, rebuilt the city, on their return. When Alexander entered Phœnicia, after the battle of Issus, the Sidonians (B. C. 335) submitted without a struggle, and received for a king, instead of Strato, Abdolonymus, of the blood royal, but then a gardener. After a siege of seven months, the aid of the Carthaginians not having arrived, Tyre at length fell by treachery, and was reduced to ashes; part of the inhabitants were put to death, and part sold for slaves. Alexander rebuilt the city, but it never attained its former importance. It afterwards fell under the dominion of the Seleucidæ, as did Sidon under that of the Macedonians. About 65 B. C., the Romans took possession of it. From that time Phœnicia shared the fate of Syria. Tyre was an important rendezvous for the crusaders (1099). The Sultan of Egypt, who took it in 1223, was soon driven out by the Franks, as were, also, the Tartars in 1263, who had made themselves masters of it under Houlakù, together with the rest of Syria. It was finally subdued, in 1292, by the Egyptian sultan, since which it has shared the fate of the ruling country. The Phœnicians are more important when considered in reference to their commerce, navigation and manufactures, than in respect of the events of their history. Compelled by the unfruitfulness of their soil, they early betook themselves to the sea as pirates, and they gradually extended their voyages to the remotest countries. They bartered the productions of one country for those of another. They discovered the manufacture of glass, wool and purple, and executed all kinds of mechanical works. Their situation would lead the Phœnicians to trade particularly in the Mediterranean. Cyprus was their nearest landing-place; thence they extended their voyages to Greece and the Grecian islands. In Rhodes and Crete they established colonies. But when the Greeks themselves became a powerful and commercial people, the Phœnicians turned to the northern coasts of Africa. Here, as in Sicily and Sardinia, they founded colonies, by means of which they traded to the interior of Africa, and with which they always continued on good terms. But their trade to Spain was the most important. Here they found gold, iron, silver, tin and lead. The preserved fruits of the south were an important article of commerce. Gades (Cadiz), the most celebrated of their colonies, was the limit of their voyages in the Mediterranean, and the beginning of the more distant voyages in the Atlantic. They sailed northerly to the Cassiterides, Tin islands (the Scilly isles and Britain), and into the North sea, as far as the mouth of the Rhine. On the western coast of Lybia they must have visited and peopled the island of Madeira and the Fortunate islands (Canaries). Their trade to Ophir, on the Arabian gulf, and on the Persian gulf, perhaps as far as Ceylon, was less important and of shorter duration. Their circumnavigation of Africa is uncertain. They traded also in goods brought to them in caravans from the interior of Asia and Africa. For a long time their trade was entirely by barter; for the Numidians, not the Phœnicians, are considered to have stamped the first coins. They invented, or at least improved, ship-building. They used rudders and sails, and followed, by night, the course of the stars. The invention of letters and arithmetic has been attributed to them, and they probably had considerable astronomical and mechanical knowledge. On the other hand, poetry and the higher branches of mental cultivation were not pursued by them. Of their writings nothing is preserved to us. Their language belongs to the Canaanite branch of the Semitic family, and is little understood. Their religion was polytheism, with the worship of images, and human sacrifices. Their chief god was called by the Greeks *Cronos* (Saturn), by the Hebrews *Baal* or *Bel*, also *Adonis* (Lord), whose worship spread into Greece and Egypt (Osiris). Their principal goddess was Baaltis (Isis), or Astarte, or Astaroth, called by the Greeks *Aphrodite* (Venus). In Tyre, Melcarth (Hercules) was worshipped as a local deity, and his worship extended thence to other countries. The Phœnicians likewise worshipped the Cabiri. The character of this commercial people was not very high among the ancients.—For further information respecting Phœnicia, see Heeren's works, eleventh volume, 1824.

PHŒNIX; a Greek coin, lately introduced, and equal to the sixth part of a dollar.

PHŒNIX; a wonderful Egyptian bird, about the size of an eagle, with plumage partly red, and partly golden. This bird is said to come from Arabia to Egypt, every 500 years, at the death of his parent, bringing the body with him, embalmed in myrrh, to the temple of the sun, where he buries it. According to others, when he finds himself near his end, he prepares a nest of myrrh, and precious herbs, in which he burns himself: but from his ashes he revives in the freshness of youth. From late mythological researches, it is conjectured that the phœnix is a symbol of a period of 500 years, of which the conclusion was celebrated by a solemn sacrifice, in which the figure of a bird was burnt. His restoring his youth signifies that the new springs from the old. Every thing which more than sixty authors have related of this bird—Strabo, Lucian, Pliny, Plutarch, Herodotus and others, and all the researches of the French and Italians—may be found in Ant. Métral's work *Le Phénix, ou l'Oiseau du Soleil* (Paris, 1824).

PHONETIC (from φωνέω, I speak); a term applied to written characters which represent sounds, as *a*, *b*, in contradistinction to ideographic characters, which express ideas; e. g. the Chinese signs of a hand and a skin, to signify *tanner*:—For further information on this subject, see the articles *Hieroglyphics*, *Chinese Language*, and *Writing*; see also *Philology*, and *Palenque*.

PHONOLOGY. See *Philology*.

PHORCUS, OR PHORCYS; son of Pontus and Terra, or, according to others, of Neptune and the nymph Thesea, was the father of many sea-monsters; for instance, the Gorgons, and the Hesperian dragon; according to some, also of Scylla and Thoosa, whom his sister Ceto bore to him.

PHOSPHORESCENCE is the property which certain bodies possess of becoming luminous without undergoing combustion, as when we rub or heat them, or in consequence of the action of the living principle or of decomposition. Two pieces of quartz emit light on being rubbed together. Light is seen in breaking lumps of sugar. A variety of blende (sulphuret of zinc), on being scratched with a knife, emits a fine yellow light. In the year 1663, Mr Boyle observed, that the diamond, when slightly heated, rubbed, or compressed, emitted a light almost equal to that of the glowworm. The most complete account we possess of the phosphorescence of minerals is that furnished by doctor Brewster. He obtained his results by placing fragments of the bodies examined upon a thick mass of iron heated a little below redness, or introducing them into a pistol barrel similarly heated. The following table presents some of his results:—

Name of the Minerals.	*Colour of the Minerals.*	*Colour of the Light.*
Fluor spar,	pink,	green.
———,	purple,	bluish.
———,	bluish white,	blue,
———,	white,	white sparks.
Calcareous spar,	transparent,	yellowish.
Apatite,	pink,	yellow,
Arragonite,	dirty white,	reddish yellow.
Harmotome,	colourless,	do.
Topaz,	white and bluish,	bluish.
Rubellite,	reddish,	scarlet.
Petalite,	reddish white,	bright blue.
Anatase,	dark brown,	reddish yellow.

The phosphorescence of anatase is entirely different from that of the other minerals. It appears suddenly like a flame, and is soon over. Certain varieties of fluor require no more heat than that of the hand to occasion the emission of light. The phosphoric light of minerals has the same properties as the direct light of the sun. The foregoing are instances in which it was not necessary to expose the bodies to the light previous to their exhibiting phosphorescence. Certain artificial compounds emit light in consequence of the action of extraneous light. The most powerful of these is the compound called *Canton's phosphorus*. It is formed by mixing three parts of calcined oyster-shells in powder, with one of flowers of sulphur, and ramming the mixture into a crucible, and igniting it for half an hour. The bright parts will, on exposure to the sunbeam, or to the common daylight, or to an electrical explosion, acquire the property of shining in the dark, so as to illuminate the dial of a watch, and make its figures legible. It will, indeed, after a while, cease to shine; but if we keep the powder in a well corked phial, a new exposure to the sun's light will restore the phosphorescent quality. When the electric discharge is transmitted along the surfaces of certain bodies, or a little above them, a somewhat durable phosphorescence is produced. Sulphate of barytes gives a bright green light, acetate of potash a brilliant green light, and rock crystal, a red and then white light. Temperature has a marked effect on the emission of light by these bodies. When they are shining, the luminous appearance ceases if they are exposed to the cold of a freezing mixture. It becomes more vivid by applying heat; and if it has ceased, it may be renewed by applying a stronger heat, so that a piece of any solar phosphorus, which has apparently lost its power, may by heat be again made to shine. Some of the phosphorescent bodies, just mentioned, after their luminousness is over, upon partially heated iron, yield on fusion a very vivid light. Lime is the substance possessing this property in the most remarkable degree. If a piece of calcareous spar is placed on charcoal before the compound blowpipe, it emits a light so vivid and white that it can scarcely be looked upon. The following fluids have been found by doctor Brewster to be phosphorescent when poured into a cup of heated iron:—Albumen (white of an egg) diluted in water, isinglass in solution, saliva, soap and water, solution of rhubarb, do. of common salt, do. of nitre, tallow (the phosphorescence of which may be observed when a candle is extinguished in a dark room), alcohol, oil of dill-seeds and oil of olives. Several cryptogamous plants have been observed to be luminous in the dark. The *Rhizomorpha phosphoreus* found in the mines of Hesse exhibits light when the extremities of the plant are broken. Other species of Rhizomorpha have also appeared phosphorescent to the miners. But marine animals are the most remarkable for this property; and to them is now fairly attributed the once mysterious phosphorescence of the ocean. This phenomenon is occasionally observable every where at sea; but it is in warmer regions and more southern latitudes, that it attains its greatest degree of brilliancy and beauty. In these parts it has been thus described by a scientific observer:—"At one time, the evening serene and delightful, a pleasant breeze just filling the sails, and the bow of the vessel throwing the water to each side, as it gracefully parts the yielding waves, all round the ship, far as the eye can reach, may be seen innumerable bright spots of light rising to the surface, and again disappearing, like a host of small stars dancing and sparkling on the bosom of the sea. At another time, the night dark and lowering, a fresh breeze urging the ship rapidly onwards through her pathless track, upon looking over the stern, in addition to the smaller specks just now mentioned, large globes of living fire may be seen wheeling and dancing in the smooth water in the wake of the rudder; now, at a great depth shining through the water, then rising rapidly to the surface, they may be seen, as they reach the top of the wave, flashing a bright spark of light, sufficient almost to dazzle the eyes of the beholder; and now, again, they may be traced floating majestically along, till they gradually disappear in the darkness of the water in the distance. At other times, again, when light rain is falling, or perhaps previously to the rain coming on, when a light nimbose cloud is overspreading the sky, upon the water being agitated by the ship passing through it, or curled up by a rope towing overboard in a bight, a beautiful, general luminousness is diffused all around, bright enough to illuminate the whole ship's side, and the lower large sails which may be set at the time; and it is no unusual occurrence to have this appearance so bright, that a person with little difficulty, and near the surface of the water, might be enabled to read." That all this light is afforded by little animalcules there cannot be the smallest room for doubt, for they have been caught in the very act of giving out the luminous appearance, and in vast numbers; and in every instance where the water has been properly examined when luminous, they have been seen in great quantities; while, on the other hand, when the water has not been luminous, they have not been visible. They have been described and figured by naturalists, who have studied them by the aid of powerful microscopes; and they are found to belong to the mollusca, the vermes, the crustacea and the zoophytes. Light is also emitted from certain land insects, as from the lightning-bug and the glow-worm. A kind of phosphorescence, still different, is that observed in decomposing animal and vegetable matter. It appears during the putrefaction of fishes, especially, but has been observed also from the flesh of quadrupeds. Our woods during autumn frequently exhibit a high degree of luminousness in light rotten wood.

The first animal possessing the property of phosphorescence, which attracted the attention of naturalists, was the *pholas dactylus*, a species of chonchiferous mollusca, protected by a testaceous shell (see Conchology, p. 380, pl. 19, f. 14). This quality in the pholas was first observed by Pliny, and has since been confirmed by Reaumur. Pliny says that the whole substance of the animal is charged with a fluid which has the property of emitting a phosphorescent light; and that it will illuminate any substance which it touches. This is the only testaceous mollusca which has the property of evolving a phosphorescent light. Dr Priestley says, "This fish illuminates the mouth of the person who eats it: and it is remarkable, that, contrary to the nature of other fish, which give light when they tend to putrescence, this is more luminous the fresher it is; when dried its light will revive on being moistened either with salt water or fresh; brandy, however immediately extinguishes it."

We have given representations of a few luminous animals in plate 32.

There are three species of beetle, of the genus Elater, which have the property of emitting light. These are the *E. noctilucus*, *E. phosphoreus*, and *E. ignitus*.

The great fire-fly (*elater noctilucus*) fig. 21, is an inhabitant of the savannas of most of the warmer parts of America, where they are to be seen in great abundance, and also about the woods of several of the West India islands. They are extremely luminous in the dark, the light proceeding chiefly from four parts; namely, from two glandular spots behind the eyes, and one under each wing. But they have the property of interrupting this light at pleasure, when these glandular spots become perfectly opaque. When the rings of the abdomen are forced a little asunder, the same luminous appearance will be seen to issue indiscriminately from every part of their interior.

A person may with great ease read the smallest print by the light of one of these insects held between the fingers, and gradually moved along the lines, with the luminous spots above the letters; but if eight or ten of them be put into a phial, the light will be sufficiently great to admit of writing by it. Oviedo says, that the Indians travel in the night with these insects fixed to their hands and feet; and that they spin, weave, paint, dance, &c., by their light.

The elaters are seldom to be seen abroad during the day, for, except in the night, they are so inanimate, as even scarcely to exhibit any signs of life. The Indians principally value them from their hunting and devouring those troublesome insects, the musquitoes, in their habitations, which would become otherwise extremely troublesome. They catch them in the night by holding up a torch on some eminence, to the light of which they soon come, when they are beaten down with the branches of trees; or sometimes one of them is held up in the fingers and moved about, which will attract to the place such as are near, when they are either knocked down or seized with the hand.

Fig. 21 exhibits the insect with the shell of the corcelet removed on one side, so as to uncover the light-emitting organ. *a* is the yellow transparent spot of the corcelet; *b*, the elliptical mass of luminous substance, surrounded by an irradiation of the interstitial substance; *c*, the ends of the muscles which are in the inside of the corcelet. Fig. 22 is a magnified representation of the luminous apparatus; *a*, the radiated appearance of the interstitial substance around the oval mass of luminous matter: this mass, it will be observed, consists of many smaller parts; *b*, represents the arrangement of the interstitial substance, when it passes down between the muscles; *c*, the ends of the back muscles; *d*, the shell of the corcelet. Dr Brown was of opinion that all the internal substance of this insect is equally luminous, and that the yellow spots appear to emit a greater degree of light, in consequence of the shell in those places being thinner. He says, that if the rings which cover the different parts of the body are forced a little asunder, the same degree of light is emitted from all the entrails indiscriminately.

There is but little difference in the appearance of the animals, and property of the light emitted by the other two species of elater. The fire-fly is one of the most splendid of the luminous insects. Mouffet informs us, that when Sir Thomas Cavendish and Sir Robert Dudley landed in the West Indies, and saw an infinite number of lights sparkling in the woods, they took them for Spaniards at a distance, advancing upon them by torch-light, and fled to their ships; but these turned out to be nothing more than the fire-flies.

This insect is of an oblong form, and an inch or upwards in length. It is so strong, and exerts such elastic powers, as, when placed on its back, it is known sometimes to spring to the height of four or five inches in recovering its natural position. Its colour is brown, except the head, which is small and blackish.

The common glow-worm (*Lampyris noctiluca*), fig. 34. During the summer season, these insects are observed after sunset, in meadows, by road sides, and near bushes. Among the crooked lanes, in every hedge, the glow-worm lights his gem, and

> ——— through the dark
> A moving radiance twinkles.

It is in the nights of the month of June that they are most frequently to be met with. In the day-time they conceal themselves amongst leaves of plants. Each sex is luminous, but in the male the light is less brilliant, and confined to four points, two of which are situated on each side of the two last rings of the abdomen. They always become much more lucid when they put themselves in motion. This would seem to indicate that their light is owing to their respiration; in which process, it is probable, phosphoric acid is produced by the combination of oxygen gas with some part of the blood, and that a light is given out through their transparent bodies by this slow internal combustion. By contracting themselves the insects have a power of entirely withdrawing it: when they are at rest, very little light is to be seen. Mr Templer, who made many observations on glow-worms, says, he never saw them exhibit their light at all, without some sensible motion, either in their body or legs: and he fancied that he sensibly felt heat when the light was most brilliant. Dumeril, in speaking of the glow-worm says, "This phosphorescent light appears to be intended by nature as the lamp of love—the pharos—the telegraph of the night, which scintillates, and marks, in the silence of darkness, the spot appointed for the lover's rendezvous." The same opinion is entertained by Kirby and Spence. They say, the torch which the ringless female, doomed to crawl upon the grass, lights up at the approach of night, is a beacon which unerringly guides the vagrant male to her love-illumined form, however obscure the place of her abode.

Whether the light emitted by the glow-worm is intended for the purpose above alluded to, or not, is yet but a conjecture; as De Geer says, "that this insect shines in its infant state, in that of the larva, and even after it has taken the form of a nymph." Now in the first of these states it cannot propagate, and still less in the second. There are several authors who affirm that the male insect also emits light. The first of these is Ray, who discovered it in the common glow-worm, *lampyris noctiluca*, which has been confirmed by Geoffroy and Müller. The light emitted by the male, however, is much fainter than in the female. Illiger mentions that in two foreign species the *lampyris splendidula* and *hemiptera*, the males emit a very vivid light. The glow-worms have the power of regulating at pleasure the degree of their light, or of obscuring it entirely. Murray says that the eggs of the glow-worm are luminous. White, in his Natural History of Selbourne, says, that from personal observation he conceives these insects "put out their lamps" between eleven and twelve at night. Shakspeare also made the same remark.

If the glow-worm is crushed, and the hands and face are rubbed with it, they exhibit a luminous appearance, similar to that produced from phosphorus. When a glow-worm is put into a phial, and the phial is immersed in water, a very beautiful irradiation takes place.

Fig. 34 is the common glow-worm (*Lampyris noctiluca*). Fig. 24 represents one of the sacs of the glow-worm extracted, and very greatly magnified, in order to exhibit its construction as described by Macartney.

Fig. 42 is a greatly magnified view of the inferior surface of the abdomen of the *lampyris lucida*, after the integuments have been removed.

The great lantern-fly. (*Fulgora lanternaria.*) This is the most vivid of all the luminous insects. It affords a light so great, that travellers walking by night, are said to be enabled to pursue their journey with sufficient certainty, if they tie one or two of them to a stick, and carry this before them in the manner of a torch. It is common in many parts of South America, and is described by Madame Merian, in her superb work on the insects of Surinam. She gives the following entertaining account of the alarm into which she was thrown, by the phosphorescent flashing which proceeded from them in the dark, before she had been apprized of their shining nature. The light emitted by this fly, proceeds entirely from the hollow part of the head, which has been denominated the lantern.

"The Indians" says M. Merian, "once brought me a number of lantern-flies, before I was aware that they shone by night, which I shut up in a large wooden box. In the night they made such a noise, that I awoke in a fright, and ordered a light to be brought, not being able to guess from whence the noise proceeded. As soon as I found that it came from the box, I opened it, but was still more alarmed, and let it fall to the ground in my fright, at seeing a flame of fire come out of it; and as many animals as came out, so many different flames appeared. When I found this to be the case, I recovered from my alarm, and again collected the insects, much admiring their splendid appearance." The light, she adds, of one of these insects is so bright, that a person may see to read a newspaper by it. We have given a representation of the punctated lantern-fly (*fulgora punctata*) pl. 33, fig. 87.

There is an insect of the Myriopodous order, the electric centipede (*scolopendra electrica*), a native of Britain, which has the property of emitting a phosphorescent light in the dark. The insect is extremely plentiful, but it seldom leaves its hole in the ground during night. When it crawls about at night, it leaves a tract of phosphorescent light which may be lifted.

Dr Afzelius discovered that the *pausus spherocerus*, an insect of the caleopterous order, yields light. One evening, on going to look at his insects, he happened to stand between the candle and the box, so that his body cast a shadow upon the insects; he was much astonished to find that the globes of the antennæ shone like two lanterns, emitting a pale, phosphorescent light. During the course of that night he examined the animal several times, when it always presented the same appearance. He was, however, prevented making experiments on it, as it died before morning, and he never could find another living specimen.

Fig. 33 is the night-shining nereis (*N. noctiluca*) greatly magnified. This animal was discovered by Vianelli. Its natural size is only a quarter of an inch. It is also certain that it yields a shining light. Vianelli noticed that there was light emitted from it at all seasons, but that it was stronger and more frequently to be seen in summer. He also observed that when the wind was about to change from south-east into the east, the intensity of the light was increased, and in the dark winter nights which succeeded a warm sun, the luminous appearance was as strong as in summer. Bondaroy says, this species increases, diminishes, or extinguishes its light at pleasure, and that it commonly issues from the posterior part of the body; but when fully illuminated, the head only is opaque. The light emitted by it is of a bluish colour.

These minute creatures inhabit every sea, and are one of the causes of the luminosity of the water in the night. They are found on all kinds of marine plants; but often leave them, and swim on the surface of the water. They are frequent at every season of the year, but particularly in summer, before stormy weather, when they become more agitated and more luminous than at other times. So small are they that myriads of them may be contained in a small cup of sea-water. Innumerable quantities of these animals lodge in the cavities of the scales of fishes; and to them, probably, many fishes are indebted for their luminous quality. "I have observed with great attention," says Barbut, "a fish just caught out of the sea, whose body was almost covered with them, and have examined them in the dark. They twist and curl themselves with amazing agility; but soon retire out of our contracted vision, probably on account of their glittering numbers dazzling the eye, and their extreme minuteness eluding our researches. It is to be observed that, when the unctuous moisture which covers the scales of fishes is exhausted by the air, these animals are not to be seen; nor are the fishes then noctilucous, that matter being, perhaps, their nourishment when living, as they themselves afford food to many marine animals.

The appearance of the nereides is particularly brilliant when the wind is in the east and south-east points; and in winter nights preceding a warm day. If water containing these animals be kept warm, they will retain their luminous appearance two whole days after they are dead; but in cold weather they lose it in the course of seven or eight hours. Motion and warmth, which increase their vivacity and strength, increase also their luminous properties.

Fig. 48 is the *nereis phosphorans*, a luminous mollusca, which inhabits the African and Indian seas.

Fig. 19 represents the animalcule discovered by Forster greatly magnified.

Fig. 18 is the *beroe fulgens*, size of life. This animal was discovered by Macartney, and is here represented in the elongated form which it assumes while in the act of swimming; on the posterior part are seen the ciliated ribs, which constitute its instruments of locomotion.

Fig. 27 is the *cancer fulgens*, represented in the natural size. It was discovered by Sir Joseph Banks, in his voyage with captain Cook, in the passage from Madeira to Rio de Janeiro; he noticed that its whole body was illuminated, and emitted very vivid flashes of light.

Fig. 51 is the *limulus noctilucus*, greatly magnified; which was discovered by Captain Horsburg.

Fig. 32 is a crustaceous animal discovered by Riville, showing the transparent shell through which the internal parts of the animal are visible: the horse-shoe-shaped appearance shows the sac containing the intestines; in front are seen the four-jointed setaceous antennæ; and on the right side are exhibited the feet armed with hooks; lower down is the larger hind foot; the small round specks represent the ova, which were mistaken by Riville for globules containing an oily fluid.

Many species of medusæ exhibit a strong light; the most splendid of these with which we are acquainted is the *pellucens*, fig. 20; which was taken from the sea at the same time with the *cancer fulgens*, by Sir Joseph Banks, in the passage from Madeira to Rio de Janeiro. The medusa pellucens emits flashes of light during its contractions, which are so vivid as to affect the sight of those who witness it. When the water, in which these animals and the cancer fulgens were contained, was emptied out of a bucket, it appeared like a stream of fire, or fused gold.

Spallanzani discovered a medusa in the strait of Messina, which he describes as being exceedingly luminous; he says, it blazes like a torch, and is visible thirty-five feet under the surface of the water. Its light, however, is variable; sometimes it continues for a quarter or half an hour, and even longer; at others it becomes suddenly extinct, and re-appears after a considerable interval. He accounts for this cessation by supposing that it is while the animal is at perfect rest. We must remark, that it is curious that the above striking appearance has not been recorded since the time of Spallanzani.

Fig. 17 is the *medusa scintillans*, greatly magnified which shows the opaque parts upon the sides, and centre of the animal. The two small globules below this figure represent the animals in the natural size.

Fig 16 is a figure of the *medusa lucida*, the size of the largest specimens which are to be met with.

Fig. 20 is the *medusa pellucens*, which was discovered by Sir Joseph Banks; about one fourth the natural size.

Riville, while on the coast of Malabar, noticed that the sea around his vessel exhibited a brilliant phosphorescent appearance; he caused some water to be drawn up, and having strained it, it no longer presented a luminous appearance; but he found the cloth covered with luminous specks, that resembled the ova of fish, both in form and size. On examining them with a lens, he perceived that they had internal motion, and on some of them being put into the water, they swam quickly about. One of these was seized with a pair of forceps, which caused it to shed a shining liquor of a blue colour, which illuminated the water for several lines. We have given a representation of this animal at fig. 32. Riville says, that the liquor does not mix with the water, but floats on the surface, like globules of oil, and shines with a phosphorescent lustre.

Captain Horsburg, and many others since his time, have ascertained that the luminous state of the sea, between the tropics, is caused by marine animals floating upon the surface of the water. Fig. 51 represents one of the animals which he discovered.

Mr Baird, in mentioning the *medusa scintillans*, says, that their size is about that of a grain of sand; but, when seen shining in the water, their apparent size was very much increased. Upon taking up a bucket full of water, from alongside the ship, and pouring it upon the deck, innumerable spots might be seen about the size of small peas, which, when taken up on the finger, and carried to a light, were scarcely discernible to the naked eye. Magnified thus by the refraction of the water and their own light, when the countless millions of them were scattered about upon the surface of the sea, upon its being agitated and set in motion by the ship's way through it, the appearance then presented was beautiful in the extreme. He mentions having met with a single specimen of medusa, in the straits of Banca, which he placed in a wine-glass full of clean sea-water, and kept it till evening. When taken to a dark place, the water upon its surface being struck and agitated by the finger, immediately gave out several bright sparks. This luminousness, however, soon ceased, the agitation of the water being continued; but when left undisturbed for some time, it seemed to recover its power, again emitting flashes of light upon being struck smartly with the top of the finger.

Dr MacCulloch states, that the luminous appearance of the sea is never seen when the ocean presents a blue colour, as then there are no animalcules present in it. Mr Baird, however, says, that he has frequently caught animalcules in it while it appeared blue: and he denies the assertion, that the luminous appearance is a precursor of a storm; and that, on the contrary, he conceives that they rather retire to the depths of the ocean before a change of weather.

It seems evident from all the observations which have been made, that the luminousness of the ocean depends in a great measure upon the animals above described, and others. But Mr D. Sharpe, in a voyage to Lisbon, particularly examined water presenting a phosphorescent appearance, emitting a light resembling the smallest stars in brightness. When a bucketful was taken up, nothing was visible until it was shaken, when it was instantly filled with spangles, which disappeared as the water settled. On carefully examining this water with a microscope, nothing could be detected but an abundance of small fibres and shreds of apparently animal matter; and hence he infers that the phosphorescence of the ocean in some cases arises from the particles of dead fishes, &c.

PHOSPHORUS was discovered by Brandt in 1669, though there are some reasons for believing that the alchemists of an earlier period were also acquainted with this substance. Brandt kept his process secret for some time. Kunckel, another German chemist, knowing only that Brandt had procured it from urine, entered on the investigation, and succeeded in discovering the process. Mr Boyle, in England, also discovered it, and Godfrey Hankwitz, a man who was taught the process by Boyle, sold it for many years, at a high price, in London. In 1769, Ghan, a pupil of Scheele of Sweden, having discovered that phosphate of lime is the basis of bones, invented the process now generally followed. It is as follows:—100 parts of burnt bones in powder are to be mixed with forty parts of sulphuric acid, and they are to be suffered to remain in contact for two days, the mixture being frequently stirred. The whole is then to be poured upon a filtre of cloth, and the liquor that passes through is to be added to a nitrous solution of lead; a white powder will be formed; this must be mixed with about one fifth of its weight of charcoal powder, and exposed to a strong red heat in a porcelain retort, the beak of which is plunged in water; much gaseous matter will come over, some of which will inflame spontaneously, and at length a substance will drop out of the neck of the retort, and congeal under the water, which is phosphorus. It may be purified by melting it in water, and passing it under water through chamois leather. It is semitransparent, and of a white, or yellowish-white colour; it is as soft as wax; insoluble in water; specific gravity, 1.77. It melts at the temperature of 90° Fahr., and boils at 550°. When phosphorus is exposed to air at common temperatures, it emits a white smoke, which appears luminous in the dark. This depends upon its combining with oxygen, and forming an acid which unites with the aqueous vapour in the atmosphere, and they fall down in the fluid form. When phosphorus is heated to about 148°, it takes fire, and burns with intense brilliancy, throwing off dense white smoke, which is a strong acid, that soon becomes liquid by taking moisture from the air. It forms three acids by combining with oxygen. When it is inflamed in oxygen gas over mercury, and the white substance produced strongly heated, the oxygen being in excess, for every grain of phosphorus burnt, four and a half cubic inches of oxygen are absorbed. The substance so procured is *phosphoric acid*. It becomes fluid at a red heat, and is not volatile, even at a white heat. Its taste is intensely acid. It acts upon and corrodes glass, and unites with alkalies and oxides. When phosphorus is heated in highly rarefied air, three products result; one is phosphoric acid, another is an easily volatile substance, appearing as a white powder, and the third is a red solid, requiring a heat above that of boiling water for its fusion. The second substance is soluble in water, and the solution is possessed of acid properties. It contains less oxygen than the phosphoric acid; for it burns and becomes fixed when heated in the air. It is *phosphorous acid*. The third substance requires less oxygen than phosphorus to convert it into phosphoric acid, and is regarded as an *oxide of phosphorus*. Phosphorus burns in chlorine gas, and unites with it in two proportions, the one of which contains twice as much chlorine as the other. When these are thrown in water, the chloride is resolved into muriatic and phosphorous acids, the bi-chloride into muriatic and phosphoric acids. Iodine also acts upon phosphorus at common temperatures. It forms with sulphur, compounds more inflammable than pure phosphorus. It is soluble in alcohol, ether, and the expressed or volatile oils, especially by the aid of a little heat. The solutions in oils are luminous when exposed to the air. The compounds formed by phosphoric acid with the alkalies, earths and metallic oxides, are called the *phosphates*. Phosphates of alkalies are partially decomposed by heating with charcoal; *phosphate of ammonia* is decomposed by heat alone. The phosphates of the alkaline earths are not decomposed when heated with charcoal. Before the blowpipe both alkaline and earthy phosphates melt into a vitreous, transparent globule. They are soluble in nitric acid without effervescence, and precipitate from that solution by limewater or ammonia. Sulphuric acid decomposes them, and separates the phosphoric acid. The alkaline phosphates are soluble and crystallizable; the earthy ones are insoluble. The *phosphites* are distinguished from the phosphates by appearing luminous when heated before the blowpipe, and by affording, on distillation, a small quantity of phosphorus. They become phosphates on exposure to the air for a little time. *Phosphureted hydrogen.* This interesting compound of phosphorus and hydrogen exists in the elastic form, and is obtained by combining phosphorus with any substance which, by a resulting affinity, shall enable it to decompose water. Thus, if one part of phosphorus is heated with ten or twelve of a solution of potash, the alkali exerts this operation,—the water present is decomposed, its oxygen combines with one proportion of the phosphorus, forming phosphoric acid, which unites with the potash; the hydrogen of the decomposed water combines with another portion of the phosphorus, producing phosphureted hydrogen. Or lime may be substituted for potash. The distinguishing peculiarity of this gas is its high inflammability, in consequence of which it takes fire whenever it is presented to the atmosphere. It cannot with safety be mixed with air in any quantity, from the violent detonation that would ensue, and it is therefore allowed to burn as it escapes from the water, in which the beak of the retort containing the materials producing it is immersed. The products of its combustion, as it escapes from the retort into the air, are phosphorous acid and watery vapour, which present at their formation a very singular appearance; the bubble of gas, as it escapes and inflames, expands into a horizontal ring of light white vapour, which enlarges in diameter as it rises until it breaks; this is phosphorous acid, wafted by the aqueous vapour, and it owes this corona form to the eccentric impulse of the explosion. It is supposed that many of those lights which are said to have been seen at night around burying-grounds, and other places, when animal and vegetable substances are undergoing decomposition, arise, in part at least, from phosphureted hydrogen. *Bihydruret of phosphorus* is a second compound of hydrogen with phosphorus, obtained when solid phosphorous acid is heated out of contact with the air; the oxygen of the water of crystallization present converts part of the phosphorous acid into the phosphoric, while the hydrogen, uniting with a small proportion of phosphorus, forms this gas. It is not spontaneously inflammable, but detonates when mixed with atmospheric air and heated to 212°. Phosphorus is employed in the arts for the construction of fire-matches, and for the preparation of phosphoric acid. Its use in medicine has been attempted, but its violence is too great to be employed with safety. The phosphates are employed as fluxes, and in the composition of pastes for the imitation of gems.

PHOTIUS; a patriarch of Constantinople, celebrated, about the middle of the ninth century, for the brilliancy of his talents and the depth of his erudition. He was a native of Constantinople, and originally distinguished himself by his learning and ability as a layman; but, on the expulsion of the patriarch Ignatius, by Bardas, was consecrated to the vacant see, 858. During the succeeding ten years, a controversy was carried on with much acrimony between him and the bishop of Rome, each party excommunicating and anathematizing the other; the consequence of which was the complete separation of the eastern and western churches. Bardas, his patron, being at length taken off by his nephew and associate in the empire, Michael the Third, that prince was in his turn assassinated by Basilius, the Macedonian, who then ascended the throne in 866. But Photius, denouncing him for the murder, was in the following year removed, to make way for the restoration of his old enemy Ignatius, and was forced to retire into banishment. On the death of that patriarch in 878, Photius, by a flattering exposition of a forged document respecting the genealogy of the emperor, acquired his favour, and, being restored, maintained himself in the patriarchal chair during the remainder of that reign; but was at length accused, on insufficient grounds, of conspiring against the new sovereign, Leo the Philosopher, who sent him, in 886, into confinement in an Armenian monastery, where he died in 891. This learned and intriguing prelate was the author of a Bibliotheca, containing an examination of 280 writers; the best edition is that of Bekker, a French translation from which was announced in 1831, in six volumes, octavo; of the *Nomocanon*, a digest of the ecclesiastical laws, acts of councils, &c., under fourteen heads; a Lexicon of the Greek Language; and numerous epistles. Of the *Bibliotheca* there are two other editions, that of Vienna, 1601, and that of Rouen, folio, 1653. Of the Lexicon, printed at Leipsic in 1808 (edited by Hermann), there is a more accurate copy in manuscript at Cambridge. The Letters appeared in one folio volume, in 1651.

PHOTOMETER; an instrument intended to indicate the different quantities of light, as in a cloudy or bright day, or between bodies illuminated in different degrees. In Leslie's photometer, the essential part is a glass tube, like a reversed siphon, whose two branches should be equal in height, and terminated by balls of equal diameter; one of the balls is of black enamel, and the other of common glass, into which is put some liquid. The motion of the liquor, which is sulphuric acid, tinged red with carmine, is measured by means of a graduation; the zero is situated towards the top of the branch that is terminated by the enamelled ball. The use of this instrument is founded upon the principle that, when the light is absorbed by a body, it produces a heat proportional to the quantity of absorption. When the instrument is exposed to the solar rays, those rays that are absorbed by the dark colour heat the interior air, which causes the liquor to descend, at first with rapidity in the corresponding branch. But, as a part of the heat which had introduced itself by means of the absorption is dissipated by the radiation, and as the difference between the quantity of heat lost and that of the heat acquired goes on diminishing, there will be a point where, these two quantities having become equal, the instrument will be stationary, and the intensity of the incident light is then estimated by the number of degrees which the liquor has run over.

PHRAT. See *Euphrates.*

PHRENOLOGY; (from φρην, *mind*, and λογος, *discourse*,) the term applied to a science of recent origin, which affects to discover the faculties and dispositions of man from the inequalities displayed on his cranium. It was long ago observed by physiologists, that the characters of animals were in a great measure determinable by the formation of the forehead, and that the intelligence of the animal, in most cases, rose or fell in proportion to the elevation or prostration of his skull. Lavater, in his system of physiognomy, went further than this, and gave to particular shapes of the head certain powers and passions: the conical head, he terms *religious;* the narrow retreating front, *weak-minded;* the broad neck, *salacious*, &c. But it was reserved to Drs Gall and Spurzheim to expand this germ of doctrine into a minute system, and to map out the whole cranium into small sections, each section being the dwelling-place or work-shop of a certain faculty, propensity, or sentiment, in all amounting to thirty-five, a number which by no means can be supposed to include all the conceivable faculties, propensities, or sentiments that may be alleged as belonging to man, but which, we may imagine, they were obliged to restrict themselves to, for want of room.

Dr Gall has the merit of first starting this modern philosophy, but to Dr Spurzheim it is mainly indebted for its systematic arrangement, and to Dr Combe of Edinburgh for its advocacy. "In the ninth year of my age," says Dr Gall, "my parents sent me to one of my uncles, who was a clergyman in the Black Forest, and who, in order to inspire me with emulation, gave me a companion in my studies. I was, however, frequently reproached for not learning my lessons so well as he did, particularly as more was expected from me than from him. From my uncle we were both put to school at Baden, near Radstadt, and there, whenever our task was to learn by heart, I was always surpassed by boys who, in their other exercises, were much my inferiors. As every one of those who were remarkable for this talent had large and prominent eyes, we gave them the nickname of ox-eyed. Three years after this we went to school at Bruchsa, and there again the ox-eyed scholars mortified me as before. Two years later I went to Strasburgh, and still found that, however moderate their abilities in other respects, the pupils with prominent eyes all learned by heart with the greatest ease. Although I was utterly destitute of previous knowledge, I could not help concluding that prominent eyes were the mark of a good memory; and the connexion between this external sign and the mental faculty occurred to me. It was not, however, till some time afterwards that, led from observation to observation, from reflection to reflection, I began to conceive that since memory has its external sign the other faculties might very well have theirs. From that moment every person remarkable for any talent, or for any quality, became the subject of new attention, and all my thoughts were directed to a minute study of the form of their heads. Little by little I ventured to flatter myself that I could perceive one constant shape in the head of every great painter, of every great musician, of every great mechanic, severally denoting a decided predisposition in the individual to one or other of these arts. In the mean time I had begun the study of medicine, when I heard much about the functions of the muscles, of the viscera, &c., but not a word about the functions of the brain. My former observations then recurred to me, and led me to suspect, what I afterwards proved, that the form of the skull is entirely due to the form of the viscus which is contained in it. From that instant I conceived the hope of being able one day to determine the moral and intellectual faculties of man, by means of his cerebral organization, and of establishing a physiology of the brain. I therefore resolved to continue my researches until I should obtain my object or find it impossible. The task would have been less difficult had I abandoned myself entirely to nature. But I had learned too much of the errors and prejudices then taught upon those subjects not to be biassed by them, and I was still further entangled by the doctrines of metaphysicians, who teach that all our ideas come by our senses; that all men are born alike; that education and accident alone make them differ. If this be true, said I, no faculty can have an external sign, and to study the brain, its parts, and its functions is absolute madness. Still I remembered my former observations; I knew that the circumstances in which my brothers and sisters, my school-fellows, and my play-mates, had from their infancy been placed were all alike. I saw that education was bestowed in vain on some persons, that others had talents without it. I observed a proportionate variety in the disposition of animals. Some dogs are born hunters, while others of the same litter cannot be taught; some are peaceful, some ill-tempered. In birds there is a similar diversity. The whole animal kingdom spoke then in favour of my strong surmises, and I resolved to prosecute my plan."

Dr Gall, a surgeon at Vienna, born in Suabia in 1757, commenced giving private lectures on the subject in 1796, but at the end of five years, the Austrian government took alarm at his novel doctrines, and prohibited his lectures, unless under a special permission. The prohibition, of course, stimulated curiosity, and added to the notoriety of the science. In 1800, he was joined by Dr Spurzheim, (born near Treves on the Moselle in 1776) who continued his colleague till 1813, both conducting their researches in common. They travelled together from place to place, visiting prisons and examining felons of every description, for the purpose of extending or confirming their theories, and lecturing occasionally, with the view of indemnifying expenses or gaining proselytes. Their great trial was at the bar of the French Institute, Paris, where they presented themselves to receive official support or condemnation of their science. A commission was named by the Institute to report upon the labours of Drs Gall and Spurzheim. After much patient investigation, the report was drawn up by the celebrated Cuvier. It was unfavourable to the science of Phrenology, and even *went so far as to excuse the Institute for having taken the subject into consideration at all.* This, it may be curious to remark, has been the fate of phrenology with every really distinguished physiologist and metaphysician. After examining its claims, they feel so satisfied of the absurdities involved in them, that they dismiss the subject from their minds, without bestowing on it any after consideration, just as a person, who has mistaken a turnip in the field for a human skull, flings it from him hastily, in the fear that he may be laughed at for having given it a moment's attention. Hence, in all our profound metaphysical works, phrenology is never or but barely adverted to; and though mere authority of high names should never be adduced, of themselves, to condemn, still it cannot be denied that their presence carries a legitimate weight in recommending a subject.*

In March, 1814, Dr Spurzheim came to Britain, and proceeded to London, where he exhibited at the Medico-Chirurgical Society's hall, commencing by a dissection of the brain. He delivered a course of lectures, but his auditors were not more than forty, and his second course was equally thinly attended. At Bath, Bristol, Dublin, and Cork, where he also delivered lectures, he was equally coldly received; but at Edinburgh, whence he proceeded, he was more successful in procuring proselytes. Attention had been drawn to the subject there by a very pungent article against phrenology in the Edinburgh Review for June, 1815, which so far favoured Dr Spurzheim as to raise curiosity about him, and fill his classroom. He remained in Edinburgh seven months, and was so successful in gaining converts, that he predicted it to be the spot from which, as from a centre, the doctrines of phrenology should spread over Britain. His prediction has been thus far verified, that Edinburgh is at this hour the very head-quarters of phrenology, and that it rejoices in a flourishing Phrenological Society which publishes Transactions, as well as in a Phrenological Magazine. The founder, also, of this society, Mr George Combe, must be allowed to be one of the best expounders and defenders of phrenology which the science yet can boast.

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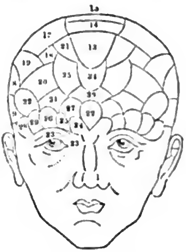
* The *British Association*, established several years ago, and the object of which is to bring scientific men annually together from all quarters of Europe, for the harmonious discussion of their various pursuits, refused to admit *Phrenology as a section* of their society. This we state as a fact, but not approvingly; for we are averse to an exclusive spirit in philosophy, or any thing else; and if phrenology be not an established science, its researches are at least intimately connected with science, both mental and physical.

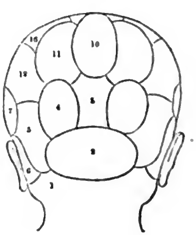
Dr Spurzheim returned to London—thence to Paris—and did not visit Britain again till 1825. Societies, with collections of busts, had by this time been established in almost every considerable town in the empire; and such was the mania of the day, that the doctor was warmly received wherever he went—at London, Liverpool, Manchester, Hull, Exeter, Dublin, Cork, Glasgow, Paisley, Dundee, &c. Dr Spurzheim eventually went to America, where he died in 1832, that fatal year for so many distinguished men. See the respective articles *Gall* and *Spurzheim* in this work.

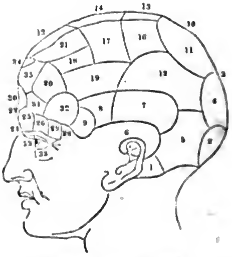
Although Dr Gall was the founder of phrenology, and although he was the discoverer of twenty-seven organs out of thirty-five, he is generally admitted to have been deficient in forming a system, or in deducing from it philosophical data. Dr Spurzheim is said by phrenologists to have contributed most to the advancement of the science, by enriching it with important discoveries, by arranging it into a system, and by showing how it might be applied to many interesting purposes connected with the human mind. We shall here give a list of the twenty-seven organs discovered by Dr Gall, with the titles he affixed to each. These titles, it will be observed, differ chiefly from those of Dr Spurzheim in being less comprehensive in their character, and therefore less pliable in representing the various faculties and dispositions of man. For example, what Gall called *murder*, Spurzheim calls *destructiveness*, thus including in it a desire to destroy noxious animals, and to kill for food; and while Gall has a bump for *veneration* and one for *religion*, Spurzheim confines himself to *veneration*, saying it includes, not only a propensity to venerate God, but to venerate wealth, power, or any distinguished personage.

The following is Dr Gall's list:—No. 1. the instinct of veneration. No. 2. the love of offspring. No. 3. friendship. No. 4. courage, self-defence. No. 5. murder. No. 6. cunning. No. 7. the sentiment of property. No. 8. pride, self-esteem, haughtiness. No. 9. vanity, ambition. No. 10. cautiousness. No. 11. the memory of things, the power of being educated. No. 12. local memory. No. 13. the memory of persons. No. 14. verbal memory. No. 15 memory for languages. No. 16. colours. No. 17. music. No. 18. number. No. 19. aptitude for the mechanical arts. No. 20. aptitude for drawing comparisons. No. 21. aptitude for drawing conclusions. No. 22. wit. No. 23. poetry. No. 24. good-nature. No. 25. mimickry. No. 26. religion. No. 27. firmness of character. The figures in this list have no relation to those on the casts.

Dr Spurzheim's arrangement of the faculties is comprised in orders, genera, &c. In the article *Craniology*, in this encyclopedia, are given cuts representing the different localities of the different organs. Without, however, referring the reader to them, we shall reprint them here, for his better convenience, it being always desirous to have the map immediately before the eye while reading the description. We shall also give from Dr Combe, Dr Spurzheim's list of the organs:







Order I. FEELINGS.

Genus I. PROPENSITIES—*Common to Man with the Lower Animals.*

The Love of Life.

An Appetite for Food.—*Uses:* Nutrition.—*Abuses:* gluttony and drunkenness.

1. Amativeness; Produces sexual love.
2. Philoprogenitiveness.—*Uses:* Love of offspring.—*Abuses:* Pampering and spoiling children.
3. Concentrativeness.—*Uses:* It gives the desire for permanence in place, and for permanence of emotions and ideas in the mind.—*Abuses:* Aversion to move abroad: morbid dwelling on internal emotions and ideas, to the neglect of external impressions.
4. Adhesiveness—*Uses:* Attachment; friendship and society result from it.—*Abuses:* Clanship for improper objects, attachment to worthless individuals. It is generally strong in women.
5. Combativeness.—*Uses:* Courage to meet danger, to overcome difficulties, and to resist attacks.—*Abuses:* Love of contention, and tendency to provoke and assault.

This feeling obviously adapts man to a world in which danger and difficulty abound.

6. Destructiveness.—*Uses :* Desire to destroy noxious objects, and to kill for food. It is very discernible in carnivorous animals.—*Abuses :* Cruelty, desire to torment, tendency to passion, rage, harshness and severity in speech and writing. This feeling places man in harmony with death and destruction, which are woven into the system of sublunary creation.
7. Secretiveness.—*Uses :* Tendency to restrain within the mind the various emotions and ideas that involuntarily present themselves, until the judgment has approved of giving them utterance ; it also aids the artist and the actor in giving expression ; and is an ingredient in prudence.—*Abuses :* Cunning, deceit, duplicity, lying, and, joined with Acquisitiveness, theft.
8. Acquisitiveness.—*Uses :* Desire to possess, and tendency to accumulate articles of utility, to provide against want. —*Abuses :* Inordinate desire for property ; selfishness ; avarice.
9. Constructiveness.—*Uses :* Desire to build and construct works of arts.—*Abuses :* Construction of engines to injure or destroy, and fabrication of objects to deceive mankind.

Genus II. SENTIMENTS.

I. *Sentiments common to Man with the Lower Animals.*

10. Self-Esteem.—*Uses :* Self-respect, self-interest, love of independence, personal dignity.—*Abuses :* Pride, disdain, overweening conceit, excessive selfishness, love of dominion.
11. Love of Approbation.—*Uses :* Desire of the esteem of others, love of praise, desire of fame or glory.—*Abuses :* Vanity, ambition, thirst for praise independently of praiseworthiness.
12. Cautiousness.—*Uses :* It gives origin to the sentiment of fear, the desire to shun danger, to circumspection ; and it is an ingredient in prudence.—*Abuses :* Excessive timidity, poltroonery, unfounded apprehensions, despondency, melancholy.
13. Benevolence.—*Uses :* Desire of the happiness of others, universal charity, mildness of disposition, and a lively sympathy with the enjoyment of all animated beings.—*Abuses :* Profusion, injurious indulgence of the appetites and fancies of others, prodigality, facility of temper.

II. *Sentiments Proper to Man.*

14. Veneration.—*Uses :* Tendency to worship, adore, venerate, or respect whatever is great and good ; gives origin to the religious sentiment.—*Abuses :* Senseless respect for unworthy objects consecrated by time or situation, love of antiquated customs, abject subserviency to persons in authority, superstition.
15. Firmness.—*Uses :* Determination, perseverance, steadiness of purpose.—*Abuses :* Stubbornness, infatuation, tenacity in evil.
16. Conscientiousness.—*Uses :* It gives origin to the sentiment of justice, or respect for the rights of others, openness to conviction, the love of truth.—*Abuses :* Scrupulous adherence to noxious principles when ignorantly embraced, excessive refinement in the views of duty and obligation, excess in remorse, or self-condemnation.
17. Hope.—*Uses :* Tendency to expect and to look forward to the future with confidence and reliance ; it cherishes faith.—*Abuses :* Credulity, absurd expectations of felicity not founded on reason.
18. Wonder.—*Uses :* The desire of novelty, admiration of the new, the unexpected, the grand, the wonderful, and extraordinary.—*Abuses :* Love of the marvellous, astonishment.—*Note.* Veneration, Hope, and Wonder, combined, give the tendency to religion ; their abuses produce superstitiou and belief in false miracles, in prodigies, magic, ghosts, and all supernatural absurdities.
19. Ideality.—*Uses :* Love of the beautiful and splendid, the desire of excellence, poetic feeling.—*Abuses :* Extravagance and absurd enthusiasm, preference of the showy and glaring to the solid and useful, a tendency to dwell in the regions of fancy, and to neglect the duties of life.
20. Wit.—Gives the feeling of the ludicrous.
21. Imitation.—Copies the manners, gestures, and actions of others, and nature generally.

Order II. INTELLECTUAL FACULTIES.

Genus I. EXTERNAL SENSES.

Feeling or Touch. Taste. Smell. Hearing. Sight.	*Uses :* To bring man into communication with external objects, and to enable him to enjoy them.—*Abuses :* Excessive indulgence in the pleasures arising from the senses, to the extent of impairing the organs and debilitating the mind.

Genus II. INTELLECTUAL FACULTIES—*which perceive existence*

22. Individuality—Takes cognizance of existence and simple facts.
23. Form—Renders man observant of form.
24. Size—Renders man observant of dimensions, and aids perspective.
25. Weight—Communicates the perreption of momentum, weight, resistance, and aids equilibrium.
26. Colouring—Gives perception of colours.

Genus III. INTELLECTUAL FACULTIES—*which perceive the relations of external objects.*

27. Locality—Gives the idea of space and relative position.
28. Number—Gives the talent for calculation.
29. Order—Communicates the love of physical arrangement.
30. Eventuality—Takes cognizance of occurrences and events.
31. Time—Gives rise to the perception of duration.
32. Tune—The sense of Melody arises from it.
33. Language—Gives a facility in acquiring a knowledge of arbitrary signs to express thoughts,—readiness in the use of them ;—and a power of inventing them.

Genus IV. REFLECTING FACULTIES—*which compare, judge, and discriminate.*

34. Comparison—Gives the power of discovering analogies, resemblances, and differences.
35. Causality—Traces the dependencies of phenomena, and the relation of cause and effect.

In addition to the above enumeration of organs, a new one has recently been supposed to be discovered, upon which the title of *alimentativeness* has been bestowed. Its property is a propensity to eat and drink, and it is therefore very appropriately placed near the organ of destructiveness. Mr Crook of London and Dr Hoppe of Copenhagen both lay claim to the discovery of this organ. The former of these gentlemen thus writes : "Three persons, with whom I had become acquainted in the year 1819, first led me to suspect that a portion of the brain, situated near the front of the ear (next to destructiveness) was connected with the pleasures of the festive board. From that time to the end of 1822, above a thousand observations were made ; as they tended to confirm this view, several phrenological friends were informed of the result. From 1823, I no longer doubted that the anterior portion of the middle lobe was a distinct organ, that its primary use was the discrimination and enjoyment of meats and drinks. It was difficult, however, to hit the fundamental power. The situation of the organ, under the zigomatic process, the temporal muscle, frequently precluded the possibility of accurate observation. But, notwithstanding, several well marked cases, both of a positive and negative kind, were investigated. These conclusions were embodied, and read to the Phrenological Society of London on the 8th of April, 1825. Two months before, though it was not known in London, a letter had been received in Edinburgh from Dr Hoppe of Copenhagen, giving the same portions of the brain to the sensations of hunger and thirst. The coincidence was felt to be remarkable, and to myself particularly so, as I had, in 1821, conceived a similar idea, but discarded it upon considering the dependence of these feelings upon the stomach and tongue. In my last conversation upon the subject with Dr Spurzheim, at Cambridge, in December, 1826, he fully admitted the discovery of the organ, but thought the instinct to eat to be the special function."

Dr Hoppe maintains, that there must be an organ in animals for the instinct of nutrition, which incites them to the sensual enjoyments of the palate, independent of hunger and thirst. "How," he asks, "should the mere sense of hunger, more than any other disagreeable or painful sensation, make the animal desire food, the necessity of such not being known to him by experience ?" "According to my opinion," he continues, "hunger and thirst must be discriminated from the desire of food, which we call appetite ; for those I consider as only affections of the stomachic and palatine nerves, caused by the defect of necessary supply ; but appetite, as an activity of a fundamental animal instinct, which has in the brain an organ analogous to the rest of the organs."

This finishes the list of organs which phrenologists have ventured to attribute to the brain, and as they have left no further room on the cranium for additional organs, we may fairly conclude that their list is terminated and their science completed. The reader, however, must be apprized, that most of the organs enumerated above have duplicates, that is, the one hemisphere of the brain is said to resemble exactly the other. This is inferred from analogy. We have two eyes and two ears, say phrenologists; so we have two organs of wit, destructiveness, &c. In those organs, however, that are situated along the middle line of the head, the two hemispheres of the brain approach so closely, that both the organs are included in one circle; but still phrenologists insist on two organs, one on each side. The advantage of possessing duplicate organs is this. It has often been objected to phrenology, that people are frequently injured on particular parts of the cranium—indeed, there are many cases, not fatal, in which portions of the brain have been actually destroyed—and yet the faculty attributed by phrenologists to the injured locality has not been in the slightest degree impaired. A soldier on the field of battle, as has been wittily observed, whose organ of Veneration receives a blow, is never heard to exclaim, 'There! my religion is clean gone! I care nothing *now* for God or the Captain!' A tender father, wounded on the organ of Philoprogenitiveness, feels no sudden disregard for his children. A miser, well banged on the organ of Acquisitiveness, does not instantly become careless of his money bags; nor is a coward, whose large bump of cautiousness has been half beaten in by ruffians, in any degree cured of his timidity. To such facts as these, phrenologists say, the brain is composed of two similar halves or hemispheres, and the organs of all the faculties are double. That one eye, one ear, or one nostril may perform its functions, and the person see, hear, or smell, although the eye, ear, and nostril of the opposite is diseased or injured, is a fact of which we all are aware. Now as the organs of the mental faculties are double, analogy would lead us to conclude, that such will also be the case with them; and that before we can expect complete loss of any one faculty, the entire organ of each side must be destroyed, just as both eyes or both ears must be diseased, before complete loss of sight or hearing occurs. But this reasoning is by no means satisfactory. For even granting the hypothesis, and not to insist on the position that it is necessary to produce something more than bare assertion for the duplicate existence of the organs before we admit their illustration as available in argument, we may say, that when a man loses his eye, he feels its want, and if he becomes deaf on one side, he is quite conscious of a defect in hearing. A similar consciousness, by analogy, should accompany the destruction of one of a pair of phrenological organs. The wounded soldier should at least become by one half less ardent in his devotions, and the wounded miser take a much less firm grasp of his money-bags. But neither the consciousness of defect nor the fact of defect accompanies the injury. Besides, it so happens, as we have already said, there is a range of faculties at the conjunction of the hemispheres of the brain, the organs of which, though called double, are quite contiguous, and therefore substantially single, so that *it is impossible to injure one without injuring both*. These organs comprehend Comparison, Benevolence, Veneration, Firmness, &c., all of which, being situated on the front, top, and centre of the head, are more open to injury than any others.*

Were phrenology an established science, and were it possible to draw unerring deductions from the data which it lays down, it cannot be denied that its discovery would be the greatest step ever made in mental philosophy, and its application the most beneficial ever used for the amelioration of the human race. It would give man a knowledge of himself, and direct him in the application of the faculties with which he might be endowed. By disclosing individual character, it would give security to social intercourse, and make communication prompt and easy. It would disclose real merit and expose unworthiness. The truly wise and good would at last attain their proper station in society; while the ignorant and vicious would be obliged to hide their diminished heads. To parents the science would be of invaluable service, in directing them as to the proper moral and intellectual training of their children; nor would any difficulty longer exist regarding the choice of a profession—no one, in future, would be made a lawyer, who should have been a painter, nor a clergyman who should have been a fiddler. In medical jurisprudence, and indeed in the administration of justice generally, phrenology would create an entire revolution. The real maniac would at once be distinguished from the responsible agent; and crime might even be prevented by securing the thief and murderer before they had given scope to their propensities.

But neither is phrenology an established science, nor, if it were, can it ever be applied with certainty to the illustration of individual character. Many of the organs are so heterogeneous in their nature, that they may indicate faculties or dispositions diametrically opposite, while others are furnished with compensating organs which balance the good or the evil of either, and thus render both ineffective. The organ of *secretiveness*, for example, which indicates a thief, also indicates a liar, an actor, and a novelist! It is even said to be necessary to constitute dignity of character! Again, you may have the organ of *destructiveness* developed largely, and yet be a peaceable and good man. How is this accounted for? Your organs of *cautiousness* and *benevolence* are brought to bear upon it, so that it is tamed down into a very harmless affair, and would not even hurt a fly. It may be said, therefore, to be kept more for show than use. Thurtell the murderer's bump of benevolence was larger than his bump of destructiveness; and his killing Weare, phrenologists say, was merely an exception to the general kindness of his disposition. They even adduce an instance in which he was known to give half-a-guinea to a poor man! By this kind of shuffling—of explaining away the character of certain organs or extending their sphere—and of balancing one organ with another—phrenologists are never at a loss in making the configuration of the skull to correspond with the propensities or mental endowments of the individual. We could give numerous instances, but we refrain. It has been said by a profound philosopher, that *every man is more than half alike*. THAT half, phrenologists, in their examinations of character, have the chance of hitting; if they miss the other half, they can easily explain the reason in their own peculiar jargon.

There are other circumstances in the way, which, even according to the phrenologists' own showing, must for ever prevent them from correctly judging of the character of man from the external surface of his cranium. An organ, they say, may be so extremely developed as to push the neighbouring organs from the places usually occupied by them; and sometimes several organs, in the vicinity of each other, are equally or proportionally developed, so that, in place of a protuberance, from which the indication might be taken, a smooth or regular surface is met with. Now, there are no fewer than five important organs in the line of each eyebrow, and if no distinct protuberance appear in this region, what is the observer to infer? Are the organs all deficient or all redundant? Must we estimate them by their absolute or relative size? Or if the smoothness arises from the extreme development of one organ raising up another, how are we to distinguish between the one which elevates and the one which is elevated?

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* It may be scarcely necessary to apprize the reader, that, although phrenologists have mapped the outer cranium into so many sections, no corresponding sections or divisions are to be found in the interior structure or arrangement of the brain. Were the brain divided into thirty-five or thirty-six cells, phrenologists might be justified in marking the divisions without, but it consists of one mass, and there is no kind of inward separation or distinction of structure corresponding with the outward boundaries of phrenological organs.

The fundamental doctrine of phrenologists is, that the size of an organ determines the power of the alleged faculty or propensity belonging to it, just as if the size of a man's eye determined the strength of his vision, or the largeness of his ears the excellence of his hearing! But size alone, they admit, is not in all cases, a true criterion—and here is another perplexity or scape-goat for the manipulator of heads. The vigour of any faculty may be increased by education or exercise, or even by disease, without any corresponding increase in its size. Thus, if a man is found with a very small organ, and a very vigorous manifestation of its supposed faculty, phrenologists escape from the fact by pronouncing the organ to be in a state of unnatural activity, from disease or some other cause. This is virtually giving up phrenology, by confessing that the size of an organ cannot be depended on *alone*. It proves that faculties may have a vigour independent of their outward protuberances —a doctrine diametrically opposed to the first principles of phrenology. Mr Combe, on this point, feeling the dilemma on which it places his favourite science, has endeavoured to draw a distinction between the *power* and *activity* of a faculty, by saying that *size* indicates the presence of the one, though not of the other. But the distinction is without a difference. For what is the power of a faculty but its activity? What is Cautiousness, but a quick sense of danger? What Imitation, but a ready faculty of copying? What Language, but a copious elocution, or a prompt recollection of words? What Wit, but sparkling thoughts and apt allusions? What Destructiveness, but readiness to destroy, the *power* lying in the arm and not in the brain?

Phrenology claims to be called the science of observation, and phrenologists are constantly vaunting of the *facts* they can adduce in support of their theories. Their cry is, 'Come to our schools and collections, and observe along with us, whether mental manifestations are, or are not, in constant proportion to cerebral development; whether a given shape of head is not always accompanied by a certain talent and a certain character. If this be not so, we are in error.' We confess that the opponents of phrenology have responded little to this invitation. They have been so satisfied with the overwhelming arguments adduced against the system from almost every point of mental and physical philosophy, that they have left the manipulating of heads and handling of skulls and casts, to the phrenologists themselves. The result has been, that phrenologists, in almost every instance, being left to state their *facts* and balance their organs after their own fashion, have made out many what they call triumphant cases in support of their theory, and challenged their opponents to a refutation of the same. In one distinguished instance, the challenge has been accepted. Mr Stone, president of the Royal Medical Society of Edinburgh, has met them on their own ground, and by a series of the most indefatigable examinations and measurements of a vast variety of skulls, has proved many of their most vaunted hypotheses to be erroneous and false. The following are some of the results of his investigations. 1. By comparing the crania of eighteen murderers with two extensive series of crania, this able inquirer has undeniably shown, that the crania of such criminals are not characterized by any superior development in the reign of Destructiveness; and that, instead of being broader, they are frequently much narrower than crania in general. 2. The superior part of the cranium, to which region phrenologists have referred the organs of the moral sentiments, is frequently found higher and better in the crania of murderers, than in crania in general. 3. The crania of murderers have not been found to exhibit any deficiency of anterior development; and sometimes, in contrast with other crania, the anterior region is even fuller and better developed in such criminals, than in crania in general. 4. The posterior development, or quantity of brain behind the ear, to which region phrenologists refer the animal propensities, has not been found to exhibit any remarkable preponderance in the crania of murderers. 5. The region of the head, to which the supposed organ of Acquisitiveness is referred, has not been found broader in notorious thieves than in individuals of exemplary character; and sometimes even narrower—proved by the distance from Acquisitiveness to Acquisitiveness having been taken in twenty-two thieves, and compared with the same dimensions in various persons, English, Scotch, and Irish, each class of individuals having been taken without any selection. 6. By a comparison of the heads of the same individuals, thieves are frequently found to possess that region of the head, to which the organ of Conscientiousness is ascribed, more highly developed than individuals of exemplary character.

The limits assigned to this article prevent us from entering upon the wide fields of physics and metaphysics with which the subject of phrenology is connected. Were it otherwise, we might deny the existence of separate and independent *faculties* at all, in the composition of what is called the human mind, which we believe to be one and indivisible; what are denominated *faculties* being rather different *acts* or rather *states* of it. But we confine ourselves to the theories and statements of the phrenologists themselves. We give them the benefit of their own assumptions, feeling assured that, even with that, their science is unable to uphold itself before the slightest investigation.

In looking over the list of faculties assigned by phrenologists to the mind of man, it is impossible not to be struck with their redundancy on some particular points, and their lamentable deficiency on others. Thus we have both *form* and *size*. According to metaphysicians, a knowledge of *extension* includes the two, *form* being but the comparative extension of the several parts of the same object, and *size* the comparative extension of two several objects. Again, the organs of *combativeness* and *destructiveness* coincide so nearly, that the absence of one would scarcely be missed if the other were in vigour. The use of Destructiveness is said to be to teach us to 'kill for food,'—upon which it has been well remarked, that we should also have organs to teach us to *dig* for food, and to *roast* or *boil* for food. Such organs as *concentrativeness* and *adhesiveness* can never be considered as primitive faculties, but only as *intensifiers* of other faculties. What is the meaning of the development of an organ, but that the faculty attributed to it is strong, and wherein, therefore, lies the utility of such organs as concentrativeness and adhesiveness, which only mean a strong and constant attachment to any particular object? Besides, what proper distinction can be drawn between the organ of *firmness* and the organs of concentrativeness and adhesiveness? Some of the organs have balancing faculties, such as *hope*, which is balanced by *cautiousness; destructiveness* by *benevolence*, &c. But why have two organs, where the two principles necessarily imply each other, and where either could be indicated by the elevation or depression of a single bump? It would be easier to bring down hope to the requisite standard, by diminishing its peculiar organ, than by leaving it large, and adding to the bulk of cautiousness. Or if a particular organ requires a compensating one, why not carry the principle out through the whole system?—why not match Veneration with an organ of Scorn, Language with an organ of Silence, or Acquisitiveness with an organ of Prodigality?

But the deficiency of the faculties attributed by phrenologists to man is still more remarkable than their occasional redundancy. This is well illustrated by Lord Jeffrey in an article of his in the Edinburgh Review (No 88, for September, 1826) equally distinguished for acute investigation and playful ridicule. "The great boast of phrenology," he says, "is, that it does not rest on fantastical and arbitrary abstractions, but on a correct observation of the varieties of actual character, and is applied, not to a mere speculative and shadowy analysis of supposed qualities, but to the undeniable realities by which men are distinguished in common life. It takes no cognizance of such questionable existences as perception, memory, imagination, or judgment; but looks at once to the peculiarities by which the conduct and characters of men in society are marked to ordinary observation. Thus it finds one man actuated in all his conduct by a strong desire of fame—and immediately it sets down 'love of Approbation' as an original principle in our nature, and looks about for a bump on some vacant part of the skull, by the size of which the strength of this propensity may be measured. Another is distinguished by his love of money—and so Acquisitiveness is established as a primitive and inherent propensity! Another is a great talker—and forthwith Language is made a distinct and independent faculty! Another has a turn for making nut-crackers and mouse-traps—and what can be so natural as to refer this to the bulk of his organ of Constructiveness? Another shows a great love for children, without indicating much benevolence to any grown creature—and nothing consequently can be plainer than that Philoprogenitiveness is an original sentiment. Some are quick at arithmetical operations—and what explanation can be so satisfactory, as that they have the faculty of Number very prominent? Others remember all the cross-roads they have ever come through—and who can deny, therefore, that they are distinguished for their Locality? Some keep their papers, clothes and furniture very nicely arranged—which can be attributed only to the degree in which they possess the faculty of Order; while there are others again, at least so Mr Combe assures us, whose genius consists in a peculiarly quick observation of the size and weight of external substances—for whose sake accordingly it has been thought reasonable to create the special original faculties of Size and Weight! This, we must admit, is sufficiently simple and bold. But where is it to stop? If we are thus to take all the tastes, habits, accomplishments and propensities, by which grown men are distinguished, in the concrete, and forthwith to refer them to some peculiar original faculty or principle, imagined for the mere purpose of accounting for them, the thirty-six original faculties of the phrenologists may at once be multiplied to 360 or 36,000—[illegible] room must be made upon the skull for as many new organs. Some men have a remarkable love for their children—and therefore we have a separate principle of *Philoprogenitiveness*. But other men have as remarkable a love for their parents—and why therefore should we not have a faculty of *Philoprogenitorness*, with a corresponding bump on some suitable place of the cranium? The affections of others, again, are less remarkable in the ascending and descending lines, and spread most kindly in the collateral;—Can it be doubted, then, that we should have a Philadelphic principle, to attach us to our brothers and sisters—and another to keep us in charity with our first cousins? If the fact, that some men are distinguished for their love of wealth is a sufficient ground for assuming that Acquisitiveness is an independent and original principle of our nature, should not the fact of other men being distinguished for their love of dogs and horses justify us in referring this also to an inherent principle?—or upon what grounds can we refuse the same honour to the love of card-playing, gossiping, or agriculture? Some men, nay some whole families are notorious for lying, though addicted to no other immorality; some—the natural prey of the former—are proverbial for credulity; some for inordinate merriment and laughter; some for envy; some for love of society; some for telling long stories; some for love of noise; some for horror of it. Most of these, it appears to us, are quite as well entitled to the rank of primitive faculties or propensities as any on the list of the phrenologists. Undoubtedly they mark as conspicuously the character and manners of the persons to whom they belong, and are not in general so easily resolved into more general principles. Why then should they be excluded from the scheme of the phrenologists, and left without any organs in their improvident distribution of the skull? Nay, upon these principles, why should there not be a separate original faculty prompting us to the practice of skating, sailing, or planting?—or towards the study of botany, mineralogy, anatomy, bookbinding, chemistry, gymnastics—or any of the other five hundred pursuits to which idle men are found to betake themselves, with an engrossing and often passionate partiality?"

There are two arguments which have often been urged in favour of phrenology. The first is, that genius is generally partial, that a man is often an excellent musician who has no talent for painting or metaphysics. Now, without insisting on the facts, that there are many causes which may lead a person to one pursuit, and that few succeed to eminence unless they confine themselves to one track, we may simply say, that we find it just as easy to admit an *original disparity* in the existence called mind, as an original difference in the size of the phrenological organs. The second argument is, that in dreaming one or more faculties are awake, while others are asleep: and if all acted by means of one organ, they could not possibly be in different states at the same time. To this it may be answered, that it is quite as difficult to understand why one of the intellectual organs should fall asleep while the others are awake, as why the mind should continue to act in some of its modes, and cease as to others.

Phrenology has often been accused as leading to materialism and fatalism, but, with all its faults, we think it has been in this instance dealt with unfairly and unphilosophically. Phrenologists expressly declare their belief, that the brain is not the mind, but simply the organized medium through which, in this life, it manifests itself. This doctrine does not appear liable to the charge of materialism. As to fatalism, the mystery remains the same, whether an individual becomes the perpetrator of harm by the fibres of his brain or by his essential nature.

PHRYGIANS appears to have been the name of the primitive inhabitants of Asia Minor, since not only the Trojans, but also the Mysians and Lydians, were so called. Under the Persian dominion, Phrygia was the largest and most central province of Asia Minor. At a later period it was divided into Greater and Lesser Phrygia and Phrygia Epictetus, the north-western part of Phrygia proper. The principal cities were Apamea, Laodicea and Colossæ. The inhabitants of this fertile region were early civilized, and paid much attention to grazing and tillage. The history of Phrygia is altogether connected with mythological events. Several of its kings are mentioned of the names of *Gordius* and *Midas*. (q. v.) On the death of Adrastus (B. C. 560), the royal family of Phrygia became extinct, and the kingdom became a province of Lydia. It afterwards formed a part of the Persian, and still later of the Roman empire. In the music of the ancients, the *Phrygian mode* was of a martial character. See *Mode*, and *Music*.

PHRYNE; one of the most celebrated courtezans of Greece, born at Thespiæ, in Bœotia. She arrived at Athens in a humble condition, but soon began to acquire wealth by trafficking in her charms. She became the mistress of Praxiteles (q. v.) and of Hyperides; the former of whom immortalized her beauty by his art; the latter obtained her acquittal when she had been accused of atheism, by exposing her charms to the aged judges of the Heliæa. This event was decisive of her success. She henceforth veiled her beauties, and sold her favours only at an enormous price. At Eleusis, she went naked into the sea, before the assembled multitude, but this was probably to renew the impression of her charms. (See *Anadyomene*.) Phryne, or, according to some, Lais, once wagered that she could melt the stern and rigid Xenocrates; but her temptations proved unsuccessful, and she declared that he was not a man, but a statue. Even in her old age, she was not without admirers, as it was esteemed an honour for any one to be able to boast that he had enjoyed her favours.

PHRYXUS. See *Argonauts*, *Athamas*, and *Helle*.

PHTHA. See *Hieroglyphics*.

PHTHIOTIS. See *Thessaly*.

PHTHISIS. See *Consumption*.

PHYSICAL ASTRONOMY. See *Astronomy*.

PHYSICAL GEOGRAPHY, or the **NATURAL HISTORY OF THE EARTH**, is that branch of geography which treats of the surface of the earth, of the atmosphere which surrounds it, of the substances which compose it, and of the organized bodies which it produces or supports. (See *Geography*.) Physical geography does not, however, enter into the minute details of natural science; it gives a general view of phenomena and their mutual relations, and leaves to the more rigorous sciences the classification of the substances of which they treat, borrowing from each its results, and connecting them into one whole. The figure of the earth and its relations to the other parts of the universe are determined by mathematical geography; physical geography points out its natural divisions into land and water, continents, seas, oceans, &c., and treats of the external configuration of mountains, valleys, coasts, &c. (See *Earth*, and the separate articles.) Having examined the surface, we attempt to penetrate the interior, and determine the structure and composition of the solid parts of the earth, its strata, caverns, veins, &c., the rocks or aggregate substances of which it is formed, their distribution, properties, age, &c. (see *Geology*); we study the remains of its past inhabitants and the proofs of the violent revolutions which it has undergone (see *Organic Remains*); and seek for the causes of those revolutions. (See *Earthquake*, *Volcano*.) We next examine the simple substances of which the earth is composed (see *Mineralogy*), and their various combinations (see *Metals*, *Earths*, *Salts*), from which we obtain so many contributions to our comfort, health or luxury. If we then turn to the fluid parts of the globe, hydrography points out its divisions into lakes, rivers, seas, oceans (*see the articles*), determines the different natural qualities of water, its temperature, chemical properties, &c. (see *Mineral Waters*), and the nature, extent and causes of those great fluctuations, which it regularly or irregularly undergoes. (See *Tides*, *Currents*.) The fluid which surrounds the globe may next be examined (see *Meteorology*), its composition determined, and the curious phenomena of which it is the theatre, and the movements to which it is subject, be studied. (See *Atmosphere*, *Rain*, *Hail*, *Snow*, *Magnet*, *Electricity*, *Winds*, &c.) After concluding our examination of inorganic nature, by researches into the local temperature of the atmosphere (see *Climate*, *Temperature*, *Zones*), we may next consider the earth as the residence of organized living beings, which adorn its surface, and feed upon its inexhaustible resources. Vegetables, from the abundance with which they are produced, and from their intimate connexion with the surface of the globe, first attract attention; botany examines, in detail, the treasures of the vegetable world, while physical geography marks its general relations and traces the influence of climate, temperature, soil, atmosphere, &c., upon the progress and extent of vegetation, and the geographical distribution of plants. (See *Plants*.) Rising above the lowest form of organic to animal life, we search the air, the land and the sea, following the motions of insects, reptiles, birds, fish and beasts, and fix the boundaries within which they are confined, or the spot of their origin and the progress of their migrations. (See *Animals*, *Zoology*, &c.) Man, in his physical capacity, his animal organization, his variety of complexion, stature, conformation and mode of life, the proportions of the ages, sexes, deaths and births, with the influence of heat and cold, moisture and drought, local habitation and climate, upon his body and mind, is the last and highest subject of physical geography. (See *Man*, *Longevity*, *Physiology*, &c.) Considered as a moral, social, political and religious being, man in organized societies is the subject of political geography. It is not to be denied that physical geography is yet in its infancy. But an inconsiderable part of the surface of the globe has yet been examined; the seas still conceal their treasures from us, and the bosom of the earth has been but partially and superficially opened to us.—See Bergmann's *Physical Geography* (Swedish, 2 vols., 8vo), the geographical works of Humboldt, Malte-Brun's *System of Geography* (vol. i.).

PHYSICS. See *Natural Philosophy*.

PHYSIOCRATIC or **AGRICULTURAL SYSTEM**, in political economy. Francis Quesnoy, physician to Louis XV., had observed the very depressed state of agriculture in France, whilst travelling with the king, and ascribed it to the mercantile system (q. v.) introduced under Colbert, which favoured the industry of the cities. Quesnoy published his *Tableau Economique avec son Explication* (1758), and developed his system in his *La Physiocratie, ou Constitution Naturelle du Gouvernement le plus avantageux au Genre Humain* (Paris, 1767, improved; Yverdun, 1768, 6 vols.), and a whole school, called the *physiocratic*, soon sprung up. It was not, however, until the reign of Louis XVI., under the minister Turgot, that the followers of the system came into office. Their authority again sunk; but, in the revolution, they had, for several years, a decided preponderance in the convention. Joseph II. of Austria, and Leopold of Tuscany, his brother, were friendly to the system, but did not allow the perfect freedom of trade which it recommended. The principles of the physiocratic system are, 1. The earth is the only source of all national wealth; and only those who use or increase the natural powers operating in the vegetable and animal kingdom, as farmers, fishermen, herdsmen, miners, add to the amount of actual wealth. All other labourers, mechanics, manufacturers, merchants, produce nothing which can increase the public wealth; they only change the form of the articles produced by the former classes, and their wages will always be paid by the surplus of raw products, which the farmer saves from his own consumption. The merchant only promotes the exchange of goods. Still less is it in the power of public officers and men in similar employments to increase the elements of wealth. 2. All members of the community, therefore, are divided into productive and unproductive. To the latter class belong scholars, artists, mechanics, merchants, &c., because all of them are to be supported by the productions of the earth, without having assisted directly in producing them. What they save from the wages received from the mass of the natural products, in various forms, contributes, indeed, to national wealth, and they become, thereby, a useful class of citizens, indirectly increasing wealth. It is only by their means, moreover, that the agriculturist is enabled to devote himself exclusively to the culture of the earth. 3. From this it follows that the unrestricted exercise of all honest occupations is necessary to the wealth of both classes. The system inculcates freedom in regard to foreign commerce, as well as to the mechanic arts, considering it a matter of indifference whether the products of a country are consumed by natives or by foreigners. 4. As, according to this system, all wealth is derived from the soil, the only subject taxed should be the net produce of the soil. The untenableness of this system, without replying to it in detail, rests chiefly in the misconception of nature and its products. The fire of the steam-engine is as much a productive natural power as that producing grain, and the plough as much a machine as the steam-engine.

PHYSIOGNOMY (from *φύσις*, nature, and *νόμος*, law, rule) is the name given to the countenance of man, considered as an index of his general character, and also to the science which treats of the means of judging of character from the countenance. This is the general acceptation of the term; but there seems no very good reason why the science of physiognomy should not be considered as extending to a man's whole appearance. Whatever be thought of the possibility of laying down strict rules for such judgments, it is a fact of every day's occurrence, that we are, almost without reflection on our part, impressed favourably or unfavourably, in regard to the temper and talents of others, by the expression of their countenances. As the face is that part of animals in which the noblest organs are united, by which they put themselves in contact with the world, and, for various reasons, shows most of their characteristic traits, it has been made the particular object of study by the physiognomist; and comparisons have been drawn between the face of man and that of animals. Bapt. della Porta (who died in 1615) made such comparisons the basis of his physiognomical investigations, and had the heads of animals compared to human faces represented. Tischbein, a German painter, has since carried out the same idea much more completely, and doctor Gall has also made such comparative representations for the illustration of phrenology. A great part of the art of painting and sculpture is founded on physiognomy. As the expression of the face depends very much upon the formation of the fore part of the skull, physiognomy is illustrated by craniology.* Among the chief points in physiognomy, Kant, in his anthropology, reckons, 1. the general information of the face, particularly in the profile, which is interesting, both in respect to the physiognomy of individuals and of nations, as Blumenbach's investigations prove; 2. the features of the face; 3. the motions of the face, as far as they have become habitual; also the walk, &c. Kant and others think they can show why physiognomy can never be elevated to a science. It is, however, a subject of great interest, but the student must be on his guard against a general application of the rules which experience seems to have furnished him. This was the reason why Lavater's system lasted but a short time, though he has collected valuable materials. (See *Lavater.*) The Dominican Campanella, who died in 1639, was a physiognomist. J. Cross published, in 1817, an Attempt to establish Physiognomy upon scientific Principles (Glasgow, 1817); and Spurzheim, the Physiognomical System. See *Face*.

PHYSIOGRAPHY. See *Mineralogy*.

PHYSIOLOGY (from *φύσις*, nature, in every sense, and *λόγος*, science). This word, first used, as it appears, by Aristotle, would signify, according to its etymology, the science which treats of all the phenomena of nature, the whole universe, and thus would comprise natural philosophy as well as natural history; but the term has been subjected to some restrictions, and is used, sometimes, for the science which treats of all the phenomena of living bodies, and thus becomes synonymous with *biology*; sometimes for the science which treats of animal life, and then is synonymous with *zoonomy* or *dynamology*; and sometimes for the science which treats of the phenomena of life in man, and then it corresponds to one of the significations of *anthropology*. The most scientific use of the word is that which applies it to the phenomena of life in general, as all the phenomena of life, animal or vegetable, are intimately connected with each other. The science would then include vegetable physiology, animal physiology, and comparative physiology, which corresponds to comparative anatomy, and examines the analogies and differences presented by the organic activity of the two classes of beings. Physiology has been further divided into general and special, the former analyzing the phenomena of life in an abstract manner, without making the application to particular species, whilst the latter examines the mechanism and the results of life in certain species. Physiology, finally, has been treated under the subdivisions of hygienic, pathologic and therapeutic physiology. As long as these divisions serve simply to assist the student, without conveying wrong ideas as to the science and the subject whch it treats, viz. life, so various in its manifestations, yet one and the same throughout all nature, they may be useful.

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* Physiognomy and phrenology, in a certain degree, always have existed and will exist. Though our rules for judging of men from their appearance may often fail, we still continue to trust in them. We cannot help considering it strange if a sulky-looking man is found to be kind, and a stupid-looking man to be sagacious. We find in the autobiographical letters of the philologer Jerome Wolf (who died 1580), a curious story, that the physician attending his father on his death-bed, looking at the forehead of young Jerome for some time, consoled his father by the assurance that his son would be, at some future time, a capable man, though he might then appear awkward and dull.—*H. Wolfii de Vitæ suæ Ratione*, &c., communicated in Raumer's *Historisches Taschenbuch*.

As man stands highest in the scale of beings which we have an opportunity to observe, he is the most interesting subject of physiology, both because animal life is most developed in him, and because his animal life is intimately connected with his intellectual and moral life; for, whatever may be the belief respecting the state of the soul before or after our existence on this earth, it is certain that during the time of our earthly life, the soul and body are, in more than one respect, intimately united. Under this view several German philosophers have treated physiology, and attempted to draw from it illustrations for the higher anthropology. Without going into that subject at present, we shall give here a brief outline of the German mode of treating physiology, which is probably less familiar to our readers than that of France and Britain. The human frame consists of a multiplicity of organs, which are constantly in a state of mutual excitement and mutual restraint. The chain of causes and effects is endless, yet observation has discovered certain series and orders, called *systems*. Thus we have the systems of reproduction, irritability and sensibility. (q. v.) The province of the reproductive system is to preserve and unfold the organization. Matter is in uninterrupted change: it undergoes a constant union and separation. This is as true of the animal frame as of the lower forms of matter. There is a constant succession of states, and the whole life of the organization consists, as it were, of innumerable smaller circles of life, beginning with that of the simple substances, each of which runs through certain changes, and then begins anew, and proceeding thence to the higher organs and systems. This constant change in the animal frame requires a constant introduction of new matter into the system, and a constant separation of that matter which has completed its brief tour of duty, and must be thrown off as useless. The new matter received has to undergo a series of changes to adapt it to the purposes of animal life. These changes are effected by means of a number of organs, whose form, construction and activity correspond to their destination. These are the organs of ingestion and digestion, the mouth, throat, stomach and intestines, the absorbing vessels of the intestines, which in their course form glands, then canals, ending at last in one canal. (See *Chyle*, *Digestion*, and *Dyspepsia*.) The received matter becomes purer and purer, that is, fitter for animal life, and eventually becomes blood (q. v.), which change is effected in the lungs (q. v.), from which the blood collects in the left cavities of the heart. (See *Heart* for an account of the circulation of the blood.) The blood is a fluid endowed with life, and is spread all over the organization, diffusing new matter and life in innumerable currents. The arterial system penetrates every organ, and every organ gives to the matter thus received its peculiar character. Part of this blood, in the shape of coagulated fibres, assumes the first organic form, the cellular texture (an animal crystallization, as it were), attaches itself to the already existing matter of the same kind, in order to assist the latter, if it is yet in the process of formation, or to supply the place of that whose virtue is exhausted, and, by further processes, gives rise to the various other parts of the human body, as the cellular texture, the various membranes, glands, hairs, bones, cartilage, muscles, arteries, the capillary system, nerves, brain, &c. These single parts, by various combinations, form the compound organs, whose functions vary with their composition. Another part of the blood is destined to be changed into various fluids; this is effected by the function of secretion, for which several organs are destined. To these belong the secretion of the saliva in the salivary glands, of the gastric juice in the stomach, of the gall in the liver, milk in the breasts, of the mucus in the mucous membranes, &c. After the various forms of organic matter have run through their short circle of life, they lose their character of animal life and activity, change their peculiar form, are dissolved, absorbed in proper canals, and thrown out. This is done by the absorbing lymphatic vessels, by the kidneys and urinary passage, the skin, &c.

The system of irritability (q. v.) is composed of the fibre formed out of the blood, and endowed with a higher life, and consists of the muscular fibre, which possesses the faculty of shortening itself by contraction. Aggregations of these fibres form a muscle. Some of these are hollow muscles, for the reception and transmission of fluids, as the heart and the muscular membranes. The others are connected with the system of bones, and serve for voluntary motion. (See *Muscles*.) The system of sensibility consists of the matter in the highest stage of life, and forms the whole system of the nerves. (See *Nerves*, and *Brain*.) These systems are closely connected, and are combined in each organ: thus we find every where cellular texture, membrane, vessels, &c., and nerves which diffuse a higher life throughout the organs, and produce, by their general connexion, a harmony in the functions of all the organs, which, if undisturbed, is called *health*. To the series which gives rise to this harmony of the functions belong also the activities of the soul, in so far as the material organization influences them, or the soul influences the material organization. For, though the life of the soul is superior to the life of the body,—the latter only following unchangeable laws of nature, the former being guided by reason and volition,—yet the close union of both, and their mutual operation, cannot be denied. The material organization affects the soul by the cerebral system and nerves, the soul receiving ideas of outward things through the senses (see *Nerves*); and though the cerebral system belongs peculiarly to the soul, yet it is nourished and maintained by the same means as the whole animal organization; and this circumstance, and perhaps the connexion of the nerves of the systems of sensibility and reproduction, give rise to what we call instincts and impulses connected with the physical wants. Further, there seems to exist a constant yet silent influence of the material organization on the higher nervous system and the brain, owing to the support of these organs by the blood, and to the connexion in which all organs are kept through the nerves; and these circumstances appear to explain the causes of the various temperaments and the change in our dispositions. The soul, on the other hand, operates upon the bodily organization by many voluntary acts, which affect the organic life, by the restraint of the appetites, and by the activity which its own operations necessarily excite in its organ, the brain; and, finally, by the direct influence of certain passions and emotions, on particular parts of the frame. All these points are minutely treated in physiology.

The history of physiology is intimately connected with that of medicine. It began with scanty materials and hypotheses. Hippocrates had but a very imperfect knowledge of the human organization, and very limited views of the origin of life. Galen, possessing a better knowledge of anatomy, composed a better system of physiology. From him originated the division of the functions into vital, animal and natural functions, which has maintained itself down to our time. After the middle ages had gone by, the more thorough study of anatomy led to a better system of physiology. Harvey's discovery of the circulation of the blood was a great step, but it induced his successors to attempt to explain life by mere mechanical and hydraulic principles. Stahl considered the soul as the cause of life and its phenomena; but Haller made an entirely new epoch, by the theory of the irritability of the fibre, which was made the basis of many systems; even Brown's theory of life, as arising from the irritability of the organization, and the influence of external things, is to be deduced from this source. The progress of chemistry and philosophy gave rise to another mode of treating physiology, the former by analyzing the simple substances of the body, the latter by the faithful investigation of what is within and what without the limits of the reasoning faculty, thereby banishing a number of untenable theories.

PHYTOLOGY (from φυτὸν, plant, and λογος, science); a word not unfrequently used for *botany* by the Germans of late, they considering it more correspondent than *botany* to the denominations of the kindred sciences, zoology and mineralogy, and better adapted to the more elevated character which the science has received of late, since the whole nature of plants has been more thoroughly studied than formerly. See *Plants*.

PIA MATER, in anatomy; a thin membrane immediately investing the brain.

PIANO (*Italian*); soft, slow; used in music in contradistinction to *forte*. *Pianissimo*; the superlative of *piano*.

PIANO-FORTE; a musical stringed instrument, the strings of which are extended over bridges rising on the sounding-board, and are made to vibrate by means of small, covered hammers, which are put in motion by keys, and where a continued sound is not contemplated, their sound is dampened immediately after the touch of the keys by means of leathern dampers. The piano has superseded the harpsichord principally owing to its greater strength, fulness and duration of tone. The strength of the tones has also been increased by increasing the number of the strings for each tone. There are usually three strings for each tone. The hammers usually strike the strings from below; but, of late, instruments have been made in Vienna, called *Kapotasto*, in which the hammers strike the strings from above, and thereby produce a stronger tone. A change or prolongation of tone is produced by means of pedals: only a few, however, are at present used. Formerly, the clavichord and the spinnet supplied the place of the piano-forte; and all three instruments possess the advantage that a single player on the same can produce a complete harmony, and the most rapid and difficult series of tones can be executed by means of a simple mechanism, on which account these instruments greatly facilitate the study of harmony. To the harpsichord the piano-forte is inferior in this single particular, that, in the former instrument, the touch has a great influence on the character of the tones, while, in the case of the piano-forte, they are in a manner prepared beforehand. This instrument is usually tabular in shape (these are commonly of a comparatively weak tone), or spinnet-formed. Those in the shape of a long spinnet (grand piano-fortes) are used as concert instruments, and have the greatest compass and strength. The grand piano-forte is one of the noblest and most elegant musical instruments. The common compass of piano-fortes at present is six octaves rising from the lowest *F*. There are also instruments of this class in an upright form; for example, *Dietanaklasis*, which, however, are less in use. The piano-forte was invented by Christian Gottlieb Schroeder of Hohenstein, in Saxony, born in the beginning of the eighteenth century (about 1717, in Dresden). It has been gradually improved, till it has become one of the most important instruments in all musical entertainments. In strength and firmness, the English piano fortes excel all others. They are, however, comparatively difficult to use, and are very expensive.

PIARISTS; fathers of the pious schools (*scholarum piarum*); the members of a religious order, who, in addition to the three usual monastic vows, took also a fourth, namely, to devote themselves to the gratuitous instruction of youth. (See *Monastic Vows*, and *Orders, Religious*). This order was instituted at Rome, in the beginning of the seventeenth century, by Joseph Casalanza (died 1648), a Spanish nobleman, and confirmed by the pope in 1621. In 1690, it was rewarded for its useful labours, by the most important privileges of the mendicant orders. The piarists are, like the Jesuits, a secular order, subject to rules. They also resemble the Jesuits in their costume, and in their devotion to the service of the church and to education, and have been the rivals of that order from the time of their institution. They soon spread themselves through the Catholic countries, particularly in the Austrian dominions, and became numerous and powerful, without subjecting themselves to the charge of ambitious views, and without meddling in political matters, as the Jesuits did. Many gymnasia and schools in Hungary and Poland are still under their direction. In Bohemia, Moravia, Silesia and Austria, they have some respectable colleges, and their services in the cause of education have undeniably been great.

PIASTER. (See *Coin*, division *Spain* and *Turkey*.) The Turkish piaster varies much in value.

PIAZZA, in architecture, is a portico, or covered walk, supported by arches; and all walks, with porticoes around them, are piazzas.

PIAZZI, GIUSEPPE, director-general of the observatories at Naples and Palermo, was born at Ponte, in the Valteline, in 1746; in 1764, entered the order of the Theatines at Milan, and studied at Milan, Turin and Rome, under Tiraboschi, Lesenr and Beccaria. In 1770, he was appointed professor of mathematics at the new university in Malta, on the abolition of which he returned to Italy, and, in 1780, became professor of the higher mathematics at Palermo. Having induced the viceroy to establish an observatory there, Piazzi went to England and France to purchase the necessary instruments. The observatory was completed in 1789, and is described in Piazzi's *Della Specola astronomica de' Registudj di Palermo*, 1792—94. His first observations were published in 1792. He soon after began his catalogue of stars, and dedicated the first, containing 6784 stars, to the institute at Paris. January 1, 1801, Piazzi discovered the planet Ceres, in commemoration of which the king of Naples wished to strike a gold medal in his honour; but Piazzi preferred that the money should be applied to the purchase of instruments for the observatory. In 1814, he completed his second catalogue, containing 7646 stars. He had also been occupied in the reformation of the system of weights and measures in Sicily. The observation of comets he always considered as useless. In 1817, the king called him to Naples to examine the plan of the new observatory there; and his last years were chiefly devoted to the subject of public education in Sicily. He died July 22, 1826. His *Lezioni elementari di Astronomia* were published at Palermo in 1817.

PIB-CORN, OR HORNPIPE; a Welsh instrument, consisting of a wooden pipe, with holes at the sides, and a horn at each end, the one to collect the wind blown into it by the mouth, and the other to convey the sound as modulated by the performer. This instrument is so common in Wales, that the shepherds' boys amuse themselves with it while tending their flocks.

PICARD, Louis Benoit, born at Paris, in 1769, early began to write for the stage with success. The friendship of Andrieux who assisted him with his advice, was serviceable to him, and he soon became an actor, making his debut at the *Théâtre Louvois* (Odéon), where his dramas were also represented with much applause. In 1801, he became the manager of the theatre, continuing to perform and write at the same time. He soon after (1806) withdrew from the boards, was admitted to the French academy, and intrusted by government with the direction of the opera. While at the head of the opera, he ceased writing, but, in 1816, resumed the direction of the Odéon, and again began to write. He died in 1828. Picard, on account of his skilful delineation of character, was called by the French *Le petit Molière*. He was the author of more than seventy larger and smaller pieces, besides several romances. Among the latter are *Le Gil Blas de la Révolution*; *L'honnête Homme*, &c.

PICARDS. See *Adamites*.

PICARDY; formerly a province of France, in the northern part of the kingdom, lying on the British channel, to the north-west of Normandy, and south of Artois. (See *France*, and *Department*.) It was for some time in possession of the British crown.

PICCINI, Niccolo, born at Bari, in the kingdom of Naples, in 1728, was designed by his father, who was a musician, for the church. But the young Piccini soon displayed such a decided taste for music, that he was placed at the Conservatoria di Santo Onofrio, at the head of which was the celebrated Leo. After spending twelve years there, he left the conservatory, thoroughly grounded in the science of music, and animated with a glowing imagination, which wanted only an opportunity to show itself. The prince of Vintimille mentioned him to the director of the Florentine theatre, and Piccini set the opera *Le Donne dispetose*, which was performed with applause. He soon after composed *Le Gelosie*, and *Il curioso del proprio Danno*. The latter was performed with applause during four successive years. His composition of Zenobia (1756) displayed his genius in the serious opera. In 1758, he was invited to Rome to set *Alessandro nell' Indie*; and in 1760, appeared his celebrated *Cecchina*, or *La buona Figliuola*, which had an unexampled run in Italy. The next year, his *Olimpiade*, a serious opera, had the same success. In this piece, the duet was first presented free from pedantry and technicality, in the new musical form, which has since been universally adopted. Piccini continued to compose for the theatres of Rome and Naples for fifteen years, during which time he enjoyed the undisputed supremacy in the public favour; but, after the appearance of Anfossi one of Piccini's operas failed at Rome, and, in consequence of the mortification which this occasioned him, he fell sick, and, after his recovery, determined to devote himself solely to the theatres in Naples. In 1776, he accepted an invitation, on very favourable terms, from the French court, and went to Paris. At that time, besides numerous oratorios, cantatas, &c., he had composed 133 operas. Being entirely ignorant of the French language, he received instruction from Marmontel, and, with his assistance, brought out the Roland of Quinault, which, notwithstanding the opposition of Gluck and his friends, was successful. Although Gluck and Piccini were personally reconciled, yet the war between their respective admirers continued (see *Gluck*); and in order to compare their merits, the two rivals composed the same subject, Iphigenia in Tauris: in this contest, Gluck had the advantage. In 1783, Piccini produced his *Dido*, which is considered his *chef d'œuvre*. He had been appointed director of the royal singing school in 1782, but the revolution deprived him of his appointments, and he returned to Naples in 1791, where the king granted him a pension, and employed him on various occasions; but, having imprudently expressed revolutionary sentiments, he was exposed to much hard treatment, and finally returned to France, where he died in 1800.

PICCOLOMINI; a distinguished family, originally of Italy. The most celebrated members are.—

1. *Æneas Sylvius Bartholomæus*, who, under the name of *Pius II*, ascended the papal throne in 1458. He was one of the most learned popes, wrote the life of the emperor Frederic III., and a history of Bohemia. He was secretary to the council of Basle, and defended the rights of the councils against the popes; but, when he was made pope, he recanted all that he had said against the extent of the papal power. His favourite plan of uniting the princes of Europe in a war against the Turks was frustrated by his death, in 1464.

2. *Octavio Piccolomini* was born in 1599, became one of the distinguished generals in the thirty years' war, was a favourite of Wallenstein, who intrusted him with a knowledge of his projects, when he purposed to attack the emperor; but Piccolomini betrayed him, and was one of those who were charged to take Wallenstein alive or dead. He was made prince of the empire, but disgraced his military renown by his cruelty. He died in 1656, in Vienna.

PICHEGRU, Charles, general of the French republic, born in 1761, at Arbois, in Franche Comte, of poor parents, was educated at that place in a monastery of the Minims (but without entering the order, as has been falsely asserted), and afterwards studied at the college of Brienne, where he distinguished himself so much by his progress in mathematical science, that the recitations of his class were intrusted to him while yet a scholar. Bonaparte was at that time his pupil at Brienne. At an early age, Pichegru enlisted as a common soldier in the first regiment of artillery, and was soon made a sergeant. Towards the end of the American war, his regiment was ordered to America, and he thus had opportunity of becoming acquainted with the land and sea service. After his return, he was appointed sergeant-major, and company-adjutant; and on the outbreak of the revolution, he embraced its principles. He was president of the political club in Besancon, when a battalion of national guards without subordination, discipline, or commander, arriving in the city, the Besancon club proposed Pichegru as a suitable person to command them. His first care was to establish order and discipline—a task which he accomplished with energy and skill, and then led his battalion to the army of the Rhine. Here he distinguished himself so favourably, that, in 1792, he entered the general staff, and became colonel, general of brigade, and, in 1793, general of division. Meanwhile the reign of terror had commenced in France. Custine, Houchard, Biron and others perished under the guillotine. The suspicions of those in power at Paris rendered it more dangerous, at that time, to be at the head of an army, than to storm a hostile battery; but Pichegru undertook the command of the forces, disorganized by the loss of the Weissemburg lines, restored discipline, and led the disheartened troops to a series of brilliant victories. To resist the numerous and better disciplined troops of the enemy, supported by an excellent cavalry, he introduced the system of sharp-shooting, and at the same time, by his skilful use of the mounted artillery, succeeded in paralyzing the tactics of the enemy. Hoche commanded at that time the right wing of the army in Alsace. In connexion with this general, and nominally under his command (although, in fact, he only followed Pichegru's plan of operation, of which he subsequently assumed the whole merit), Pichegru stormed the lines of Hagenau, December 23, 1793, relieved Landau, and took Lauterburg.

These successes gained him the highest commendation in Paris, even from Robespierre and Collot d'Herbois. On the dismissal of Hoche, in 1794, he was appointed to command the army of the north, which disasters had reduced to a state of disorganization. Here he also restored order and discipline. After failing in the attack (made by command of the committee of safety) on the enemy's centre, under the prince of Cobourg, Pichegru, at his own peril, pressed forward into West Flanders, and, by thus turning the enemy's flank, gained (April 26—29) the brilliant victories of Courtray, Montcassel and Menin, which forced Clerfayt to a hasty retreat. May 18, he defeated the united forces of prince Cobourg and York, between Menin and Courtray, and, to draw Clerfayt from his strong position at Thiel, he made a movement towards Ypres, near which he defeated the Austrian general, June 10 and 13. All West Flanders fell into the hands of the French, and, Jourdan having soon after gained the victory of Fleurus, Pichegru passed the Scheldt, and thus cut off Clerfayt from the British army, took Bruges, Ostend, Ghent, and Oudenarde, and besieged or blockaded Nieuport, Sluys, Condé, Valenciennes, and Quesnoy. He then advanced to Mechlin, defeated on the 16th and 17th of July the combined British and Dutch, took Antwerp, drove (in Sept.) the British beyond the Meuse, and, after a siege of three weeks, captured Hertogenbosch (see *Bois le Duc*), then deemed impregnable. October 19, he again defeated the British at Puhlach, blockaded Grave, and occupied Hulst, Axel, Sas de Gand and Nimeguen. The cruel commands of the convention, to spare no Briton, and to put to the sword the garrisons of Condé, Valenciennes, Landrecies and Quesnoy, unless they immediately surrendered, were evaded by Pichegru; and on January 2, 1795, with an army destitute of almost every thing but courage, he crossed the Waal and Meuse on the ice, took Grave, Bommel island, and fort St Andrew, by storm, and invested Breda. Thus was Holland conquered, the Dutch army dispersed, the British obliged to embark; the hereditary stadtholder fled to Britain, and Pichegru entered Dortrecht and Amsterdam in triumph. The convention now conferred on him the chief command of the army of the Rhine and Moselle; but he retained at the same time, the command of the army of the north, under Moreau, and of the army of the Meuse, under Jourdan.

In April, 1795, he was recalled, to take command of the capital, where the terrorists were making their last efforts to recover their power. Having suppressed the insurrection of the fauxbourgs, for which he was called in the convention "the saviour of the country," he returned to the army of the Rhine, where, however, his career, hitherto so brilliant, now took another turn. He entered into negotiations with the prince Condé, through Fauche-Borel to co-operate in the restoration of the Bourbons. He was promised offices of honour, domains and rents. But the secret was soon revealed to the French government. Pichegru's conduct as general had already excited suspicion, for, instead of improving his advantages over the enemy, he had retreated when he should have advanced. But Montgaillard, an agent in the negotiations of the Bourbons with the general, in whose hands was the correspondence on the subject, delivered up the papers to the directory, who, too weak at the moment to bring the general to an account, recalled him from the command, in 1796, under the pretence of appointing him ambassador to Sweden. Pichegru declined the post of ambassador, but was blind enough not to perceive the storm which threatened him, and, instead of saving himself while it was still time, he retired to the abbey of Bellevaux, near Arbois, which he had purchased, where he lived in narrow circumstances, till March, 1797, when the electors of his department (the Upper Saone) chose him representative in the legislative body. Here he was chosen president of the council of the five hundred; but he did not abandon his secret projects. On the contrary, he appeared at the head of the Clichy party, and incurred suspicion by his propositions in relation to the new organization of the national guards of Paris, evidently intended to overthrow the republican party. The directory, in concert with the council of elders, secretly sent for troops from the Italian army under Augereau, by whose aid, September 4, 1797 (18 Fructidor, year V.), the plots of the royalists were baffled, and Pichegru, with his accomplices, was arrested and sent to the Temple. The directory published the correspondence of Pichegru with the emigrant Bourbons, particularly with Condé, part of which had been obtained through Montgaillard, and part found by the army of the Rhine under Moreau, in the baggage of general Klingin, and, with twenty of his accomplices, he was condemned to deportation to Cayenne. The prisoners were conveyed by way of Blois to Rochefort, where they embarked. Having arrived at Cayenne, they were transported to the unhealthy wilderness of Sinamari, where most of them died of the marsh fever. Pichegru and seven others succeeded, after remaining there eight months, in escaping to Paramaribo, the capital of the Dutch colony of Surinam, in a light boat.

From this place they went to Britain, where Pichegru, now an avowed adherent of the Bourbons, met with a favourable reception, and was ordered to join the Austrian and Russian army, under Korsakoff. But as Korsakoff, to whom Pichegru, before the battle of Zurich, had given some useful advice, which was neglected, was defeated, Pichegru returned to Britain, where he was often consulted both by the ministers and by the French princes. The latter, as is well known, flattered themselves that Bonaparte would play the part of general Monk, and restore the exiles to the throne; but as the grounds for this hope disappeared, it was resolved to put the first consul out of the way; and in the execution of this plan, Pichegru and Georges Cadoudal, chief of the Chouans, and inventor of the infernal machine, with whom Pichegru had become acquainted in London, were employed. Having been landed on the French coast by captain Wright, in January, 1804, with several of the old Vendean leaders, the conspirators repaired in disguise to Paris, hoping to find there a party favourable to their views, and to engage Moreau in their plans. But the police (under Fouché) discovered the plot, and Georges was suddenly arrested. Pichegru escaped his pursuers several days, but was finally betrayed by a merchant, with whom he had taken refuge, and arrested Feb. 29, 1804. He was confined in the Temple, and a process commenced against him; but he was found one morning (April 6) strangled in prison. An attempt was made to fix on the first consul the stigma of having caused the unhappy man to be tortured and then strangled; but this would have been a most wanton act of cruelty; the ordinary legal process would have resulted in his condemnation to death, as it was proved, by his own confession, that it had been the intention of himself and his accomplices to make away with the existing head of the state. It is more probable that, in despair at the failure of a plot equally foolish and wicked, he committed suicide by strangling himself with the silk handkerchief, which was found about his neck. His body was publicly exposed the day after his death, and no traces of torture could be perceived. His private character is deserving of much praise. Disinterested in a high degree, he declined the gifts that were frequently proffered him, and his humanity to prisoners was exhibited on more than one occasion. When he was transported to Cayenne, he was so poor that his friends were obliged to sell his effects, to procure him money for his voyage. Montgaillard published a *Mémoire concernant la Trahison de Pichegru dans les Années* 3, 4 *et* 5 (1795, 1796 and 1797), which contains many disclosures with respect to his negotiations with the Bourbons.

PICHINCHA, THE BATTLE OF, was fought near the celebrated volcano of this name, May 24, 1822, between the Colombians under general Sucré, and the Spaniards, assembled for the defence of Quito. Sucré succeeded in gaining the vicinity of the capital, and turning the left flank of the Spanish army stationed near it, by marching over the frozen summits of Cotopaxi, and sleeping on the mountains. In consequence of this and several successive daring movements of Sucré, the royalists found it necessary to hazard a battle, and sustained a total defeat. Quito and the Spanish forces capitulated the next day, and the patriots thus became possessed of the entire presidency, with all the Spanish magazines and stores; and the road to Peru was left open to Bolivar.

PICHLER, OR PICKLER, JOHN ANTHONY, and JOHN (father and son); two artists, celebrated for their skill in gem-sculpture. The father was born at Brixen, in Tyrol, in 1700, and died at Rome, in 1779, with the reputation of having restored this art to a high degree of perfection, which had sunk entirely since the times of the ancients. His son was born at Naples, in 1734, and excelled his father. His Hercules struggling with the Nemæan Lion, his Leander and his Achilles, are master-pieces, acknowledged as such by all connoisseurs, and esteemed very nearly equal to the most perfect works of antiquity. Pichler lived in Rome, where he saw the emperor Joseph II., who raised him to the rank of nobility, and wished him to live in Vienna with a decent salary; but Pichler refused this offer, as well as several invitations to go to Britain. He died at Rome, in 1791, where J. G. de' Rossi published a biography, subsequently translated by Boulard and Millin into French, and published in the *Magazin Encyclopédique*, with notes by Dufourny. A bust of Pichler, made by Chr. Heveston, was placed in the Pantheon.

PICK-AXE; an axe composed of a wooden handle, and an iron head, which has two slightly curved prongs, situated on each side of the handle, and forming one piece. The pick-axe is employed in loosening the soil, in picking out pavement, &c.

PICKETS, in fortification; sharp stakes, about three feet long, sometimes shod with iron, used in laying out ground; but when used for pinning the fascines of a battery, they are from three to five feet long. In the artillery, pickets five or six feet long are used to pin the park lines; in the camp, they are used about six or eight inches long to fix the tent-cords, or five feet long in the cavalry camp to fasten the horses.

PICKLE-HERRING. See *Harlequin*.

PICO; one of the Azores, so called from a very high mountain, terminating, like Teneriffe, in a peak. See *Azores*.

PICO DELLA MIRANDOLA. See *Mirandola*.

PICQUET. See *Piquet*.

PICROMEL; the characteristic principle of bile, and named from two Greek words, signifying *bitter* and *honey*, in allusion to its sharp, bitter and sugared taste. If sulphuric acid, diluted with five parts of water, be mixed with fresh bile, a yellow precipitate will fall. On heating the mixture, leaving it to repose, and decanting off the clear part, what remains is a compound of picromel and sulphuric acid. It is edulcorated with water, and digested with carbonate of barytes, the result of which is that the picromel is liberated and left dissolved in the water. On evaporating the water, the picromel is obtained in a solid state. It resembles inspissated bile. Its colour is greenish-yellow. It affords no ammonia by its destructive distillation; hence the absence of nitrogen is inferred, and the peculiarity of picromel.

PICROTOXIA (meaning a *bitter poison*) is the peculiar principle of *cocculus indicus*. When separated from the colouring matter and other substances with which it exists in the berries of this plant, it presents itself in four-sided crystals, of a white colour and an intensely bitter taste. Alcohol dissolves one third of its weight of picrotoxia. It is soluble in twenty-five times its weight of water. Pure sulphuric ether dissolves two-fifths of its weight. It is soluble, likewise, in other acids, and may therefore be regarded as a vegeto-alkaline principle. M. Casaseca thinks that it is not a vegetable alkali, but merely a peculiar bitter vegetable principle.

PICTET, MARCUS AUGUSTUS, a naturalist, born at Geneva, in 1752, was the pupil and friend of the celebrated Saussure, whom he succeeded as professor of philosophy, in 1786. Pictet, after the incorporation of Geneva with the French republic, was one of the fifteen appointed to manage the public debt and the fund for the support of the Protestant church. In 1803, he became secretary of the tribunate, as a member of which he exerted himself particularly in extending the freedom of trade, and in improving and laying out roads and canals. In 1807, on the abolition of that body, Napoleon appointed him one of the fifteen general inspectors of the imperial university. In connexion with his brother Charles, and Maurice, mayor of Geneva, he established, in 1796, the *Bibliothèque Britannique*, a periodical which, since 1816, has been issued under the name of *Bibliothèque Universelle*. In 1803, Pictet travelled in the British isles, and, after his return, published his *Voyage de trois Mois en Angleterre, en Ecosse et en Irlande*. He was the author of several other works, chiefly on physical, mathematical and agricultural subjects.

PICTOU; a thriving commercial town in the northern part of Nova Scotia. The first house was built in 1790. In 1827, it contained 1439 inhabitants. It is the resort of coasters from all parts of the gulf of St Lawrence, the eastern shores of Prince Edward's island, and the north coast of Cape Breton. The coal-mines in its vicinity are very extensive, and the coal is excellent. Iron is also found, and manufactured in small quantities. The harbour is capacious, and easy of access. There is no other town in Nova Scotia, except Halifax, so well situated for trade.

PICTS. See *Scotland*, division *History*.

PICTS' WALL; an ancient wall built by the Romans to defend the Britons from the incursions of the Scots and Picts, from Carlisle to Newcastle. It was first built of earth, by the emperor Adrian, in 123, afterwards of stone by Severus, and, in 430, rebuilt of brick by Aetius, the Roman general. It was eight feet high, twelve thick, and nearly 100 miles in length. There are still some remains visible in the counties of Northumberland and Cumberland.

PICTURES, LIVING, OR TABLEAUX VIVANS. After attitudes (q. v.) had become a peculiar study (see *Hamilton, Lady*), the imitation of the attitudes of statues or pictures by living persons became very popular, and it was but one step farther to give to living persons the appearance of a picture. A frame is made of sufficient width, covered with gauze, behind which the persons stand in their proper attitudes, either invented by an artist (e. g. from the striking descriptions of a poet), or taken from celebrated historical pictures, gay or grave. Living pictures are particularly popular in Germany, where they are sometimes exhibited on the theatre with the necessary preparations, much more often, however, in families on birth-days and similar festive occasions, and are a source of great and refined amusement.

PICTURESQUE, in the most general meaning of the word, denotes every thing proper for painting; that is to say, such objects as present a variety of tints, the charm of light and *chiaro scuro*, &c. It is particularly applied to wild, romantic scenery. The word is easily transferred from the subject to the treatment; and we call a picture which satisfies the claims of art, is perfect in its grouping, represents a charming whole, &c., *picturesque*. This word, too, like numerous other terms used in painting, is applied to the art of describing and representing by the pen; and a book of travels is called *picturesque* if it represents a variety of things and scenes in a lively and forcible manner. *Picturesque*, too, is often applied, at least in French, to books of this sort, when accompanied with illustrative designs, as in the common title *Voyage pittoresque*. In the theory of the arts, the word *picturesque* is used as contradistinguished to *poetic* and *plastic*. The *poetical* has reference to the fundamental idea to be represented,—to the painter's conception of his subject; whilst the *picturesque* relates to the mode of expressing the conception, the grouping, the distribution of objects, persons and lights. The poetical part of a picture, as well as its mechanical execution, may be without fault, and yet the picture a total failure, as regards the picturesque.

PICUS, an old soothsayer, or wood-deity, in Italy, son of Saturn and father of Faunus, was beloved by the sorceress Circe, who changed him into a woodpecker because he would not return her passion. His wife, Canens, pined away into air from grief. Picus was represented with the head of a woodpecker, and presided over divination.

PIEDMONT; a principality and principal province of the Sardinian monarchy, from which it was separated by the French in 1798, and, in 1802, incorporated with France. (See *Sardinian Monarchy*.) On the fall of Napoleon (1814), it was restored to the king of Sardinia, and the duchies of Milan (the Sardinian part) and Montferrat have been united with it. It is now divided into twenty-six districts. Piedmont, in a narrower sense, borders on the Valais and Savoy to the north, on France to the west, on Nizza and Genoa to the south, and on the Sardinian Milanese and Montferrat to the east. Within these limits, it contains a population of 1,400,000, on a superficial area of 6575 square miles; including the Sardinian Milanese and Montferrat, it has a population of 2,322,000 on 12,000 square miles. Piedmont has its name (*pie di monte*, foot of the mountain) from its situation, at the foot of the Pennine Alps (in which are the lofty Montrosa and the Great Bernard) on the north, and of the Graian and Cottian Alps (including Montblanc, the Little Bernard, Montcenis and Monteviso) towards France and Savoy. The principal river is the Po, which flows down from these mountains, and receives all the rivers of the province; the Doria, Stura and Sesia from the left, and the Vraita, Maira and Tanaro from the right. On the south lie the Maritime Alps, separating Genoa and Nizza from Piedmont. To the north and west it is covered with high mountainous chains, from which less elevated ridges shoot off, and terminate, in the central part, in plains. This portion, which is watered by the Po, and which is composed of an agreeable variety of hill, plain and valley, is the most fertile part, and is in a state of high cultivation, yielding corn, wine, oil, fruits, rice and hemp. The breeding of the silkworm is carried to such extent in no other part of Italy, and produces yearly 22,000,000 *lire* worth of silk, most of which is exported raw. The northern, western and southern districts supply the central region with wood. The Piedmontese are industrious and frugal, and are all Catholics, excepting 20,000 Waldenses. (See Chateauvieux's *Letters on Italy*.) They have some silk, linen and woollen manufactures, and thousands of them are seen travelling about Italy, France and Germany, as pedlers. Their language is a mixture of the French and Italian. The capital of Piedmont is Turin.

PIEDMONTESE REVOLUTION. When the house of Savoy was restored, in 1814, to its possessions on the mainland of Italy, it understood not how to act under the existing circumstances. Salutary regulations, which had been introduced during the period of the French dominion, were annulled, and oppressive ones retained. French and Sardinian forms conflicted, because the officers of the old and of the new organizations did not understand one another. The course of justice was arbitrarily interrupted, and the greatest dissatisfaction was created by the character of the French military police. This state of things induced several men of the highest classes to aim, in imitation of France, at a constitutional form of government for Savoy, Piedmont and Genoa. The events in Spain, Portugal, and Naples increased the excitement. Austria was making preparations against Naples, and the resistance expected there increased the hopes of the *Adelfi* and *Federati* for Italian independence. The friends of the constitutional system and the enemies of the Ultramontanists formed a combination for obtaining, by force, a freer form of government. Thus, at the end of Feb., 1821, a conspiracy arose among the nobility and officers. Through the influence of the Spanish ambassador to Turin, the chevalier Bardaxi, the Spanish constitution became the watch-word of the disaffected, though some preferred the system of two chambers and the French constitution. It was the intention of the conspirators to choose the prince of Carignano, their chief. The revolution broke out, March 10, among several regiments at Fossano, Tortona and Alessandria. The conspirators had gained ever the common soldiers by the rumour that Austria required the disbanding of the national army, and designed to occupy the principal fortresses of Piedmont with Austrian troops. Alessandria was the focus of the revolution. On the 11th, the cry of rebellion, and "Huzza for the king and the Spanish constitution!" was heard in Turin. On the 12th, some officers opened to the *Federati* and the students the citadel of Turin. The people now, for the first time, joined in the cry "Huzza for the king! Huzza for the Spanish constitution! War on the Austrians!" On the 13th, king Victor Emmanuel resigned the crown, and, in the absence of his successor (his brother Felix, duke of Genevois, who was then at Modena), appointed prince Charles Albert of Carignano regent. All the ministers received their dismission. The state-prisoners were set at liberty, and the Carbonaria triumphed in all places, with the exception of Nizza, whither Victor Emmanuel repaired, and of Savoy. On the evening of the 13th, the regent found himself compelled, at the demand of the deputies of Turin, to proclaim the adoption of the Spanish constitution, on condition, however, of the royal consent. He swore to it on the 14th, but with a reservation of the former order of succession, and of toleration towards all religions, besides the changes to be made by a national parliament and the king. He appointed, at the same time, a new ministry, and, on the 16th, a supreme junta. Savoy was comparatively little affected by the revolution. It excited, however, much interest in Lombardy, and some young men from Milan and Pavia hastened to Alessandria and Turin. Meanwhile, the emperor of Austria at Laybach had ordered, on the 14th, that an army should advance to the frontiers of Piedmont, and Alexander caused 90,000 Russians to march from Volhynia to Italy; but, the insurrection being speedily quieted, they halted in Galicia. The duke of Genevois proclaimed at Modena, on the 16th, all that had been done since the abdication of his brother, null and void, and placed the count Salieri della Torre, governor of Novarra, at the head of the royal troops, to put down the insurgents. This proclamation deprived the junta of courage and energy. In Turin, however, the insurgents maintained their influence; the Austrian ambassador was obliged to depart; an army was assembled to occupy Lombardy, and, on the 21st, the regent, the prince of Carignano, appointed the count of Santa Rosa minister of war. But that same night the prince fled to Novara, whence he repaired to the Austrian head-quarters, then to Modena, and thence (as the duke of Genevois forbade him the court) to Florence. He remained in retirement till 1823, when he fought as a volunteer in the French army against Spain, after which he returned to Turin. He had formally renounced the regency on the 23d. The minister of war ventured on the most daring steps. In the orders issued March 23, he declared that the king was to be regarded as a prisoner of Austria; and all the Piedmontese were called to arms; the Lombards, he said, would join them, and France would not refuse its assistance. In Genoa, where the governor, count Desgeneix attempted, on the 21st, to restore the old order of things, a part of the people and troops, on the 23d, maintained by force the Spanish constitution. But the news of the destruction of the Neapolitan army in the Abruzzi quelled the courage of the insurgents. Under these circumstances (according to Santa Rosa's account), the Russian minister at Turin, count of Mocenigo, suggested an amicable mediation: "no Austrian was to enter Piedmont; full amnesty might be hoped for, and even a constitution." The junta accepted the proposition, but it was rejected by the conspirators in Alessandria. Meanwhile, at the request of the duke of Genevois, an Austrian corps under count Bubna had approached the frontiers. April 8, Bubna formed a junction with the royal army at Novara. A battle took place, and the insurgents, after a brave resistance of seven hours, were wholly dispersed on the bridge over the Agona. The victors advanced, without opposition, towards Turin. The junta, therefore, separated on the 9th. Count Santa Rosa evacuated the citadel, and on the 10th, Della Torre, the royal commander, entered Turin. On the 11th and following days, the Austrians took possession, without resistance, of the citadels of Alessandria, Voghera, Tortona, Casale, Vercelli, Stradella and Valenza. In consequence of the treaty of Novara, of July 14, 1821, the Sardinian government paid 300,000 francs monthly, for 12,000 men, besides furnishing their provision. The number of the foreign garrison troops was subsequently diminished to 5000 men; and after the treaty of Verona, of Dec. 14, 1822, the last evacuation—that of Alessandria—took place, Oct. 31, 1823. The restoration of the absolute authority of the king ensued, April 10. The duke of Genevois, however, did not assume the regal dignity till his brother, by the declaration of Nizza, of April 18, persisted in his abdication. The insurgents fled, some through Switzerland to France, some embarked in Genoa for Spain. The property of sixty-five persons who had fled was confiscated, and July 19, Aug. 10 and 23, 1821, twenty-one were condemned to be hanged for high treason, and their property to be confiscated. The rest, likewise twenty-one, were sentenced to the galleys. Of the whole, however, but thirteen were arrested, among whom were two of those condemned to be hanged. Of these, one was executed at Genoa, and the other banished, because he had, on his flight, been driven to Monaco by a tempest. At the same time, the king issued from Piacenza rigorous prohibitions of secret societies, and two decrees of amnesty, with many exceptions. Oct. 17, 1821, he made his entry into Turin.

Concerning the revolution of Piedmont, see the *Trente Jours de Révolution en Piémont*, by an eyewitness (Lyons, 1821); *Précis Histor. sur les Révolut. des Roy. de Naples et de Piémont, en* 1820 *et* 1821, *par M. le Comte D.* The *Hist. de la Révolut. de Piém.*, by Alphonso de Beauchamp (Paris, 1821), contains much that is false. The *Simple Récit des Evénemens arrivés en Piém. dans le Mois de Mars et d Avril.* 1824. *par un Officier Piémontais*, is not impartial. Count Santorre de santa Rosa, one of the opponents of the government, wrote, in France, *De la Révolution Piémontaise* (*3me édit., augmentée de Notes et de l'Analyse de la Constitut. Sicilienne*, Paris, 1822).

PIENO (*Italian*, full); a word often used for *tutti*, *grande*, or *grossi*; and sometimes with *choro*, as, *pieno choro* (a full chorus); sometimes employed in a vehement or energetic sense.

PIEPOWDER COURT. See *Courts of England.*

PIERIAN; an epithet given to the muses, from mount Pierus, in Thessaly, which was sacred to them, or from their victory over the nine daughters of the Macedonian king Pierus, who were changed into magpies for having dared to engage in a contest with them.

Pierides was also one of their designations, for the same reasons.

PIERRE, Jacques Bernardin Henri de Saint, one of the most ingenious and feeling philosophical French writers, born at Havre, in 1737, was, in his twelfth year, so disgusted with the restraints of school, that he sailed with his uncle to Martinico. After his return, which was hastened by home-sickness, he entered the engineer school at Paris, and went to Malta in the capacity of an officer. A duel obliged him to flee, and he received the place of sub-lieutenant of engineers in the service of Catharine II., which he resigned after eighteen months. He next served with the French party in Poland, was made prisoner by the Russians, released, and, after residing in Warsaw, Dresden, Berlin and Vienna, returned to Paris. He obtained a commission in the engineer corps, stationed in the Isle de France, but in two years threw up his commission, on account of some disputes in which he became involved, and returned to France. Here begins his literary life. He divided his small pension with his mother, and, in 1773, published his *Voyage à l'Isle de France.*

In 1784 appeared his *Etudes de la Nature*. Louis XVI. now appointed him superintendent of the botanical garden and of the museum of natural history. His *Paul et Virginie* (1788) passed through fifty impressions in one year, and has been translated into almost all the languages of Europe (English by Helen Maria Williams). Napoleon conferred on him the order of the legion of honour, and Joseph Bonaparte granted him a pension of 6000 francs. St Pierre was also the author of *La Chaumière Indienne*, *Harmonies de la Nature*, and several other works. His *Œuvres* appeared at Brussels, in 8 vols. He died January 21, 1814, at his estate near Paris. Aimé Martin has written an Essay on the Life and Writings of Bernardin de St Pierre (Paris, 1820), and edited his works, in 12 vols., 8vo.

PIERRE, St; a small island belonging to France, near the southern coast of Newfoundland; lat. 46° 46′ N.; lon. 56° 9′ 27″ W. The inhabitants, in 1831, 1025 in number, were engaged in the cod fishery. The colony of St Pierre and Miquelon is under an officer residing in St Pierre, called the *commandant and administrator*. These islands are also fishing stations for the French vessels engaged in the fishery in this region, the number of which, in 1825, was nineteen. They are important to France, as being the only possessions which she retains in these latitudes.

PIERROT; a comic mask on the French theatre, a mixture of the harlequin and the pulchinello. He is dressed like the latter, and is facetious like the former. With the Italians, he is a simpleton and servant. See *Masks*.

PIETE, MONT DE. See *Lombard-House*.

PIETISM, in German theology. The name of *pietists* was originally applied, in derision, to some young teachers of theology at Leipsic, who began, in 1689, to deliver ascetic lectures on the New Testament (*collegia philobiblica*, or *collegia pietatis*) to the students and citizens. The idea of imparting theological instruction in a popular way, came from their friend and teacher Spener (the German Fénélon), who had held religious meetings in Frankfort from the year 1670, at which the laity prayed, and were allowed to ask questions, &c. The theology of the Lutherans, at that time, had become stiff and dogmatical, attacking unsparingly all other systems, and making the essence of theology to consist in doctrines. Spener and his friends were desirous of re-establishing a Christianity of love and charity, which should manifest itself in the life of the individual. The governments, however, in several places, soon prohibited such assemblies, and, in some cases, they may, in fact, have given rise to disorders. Pietism, however, did not expire; on the contrary, the practical principle that a pious life was better than erudition, gave it much success. An austere, often sombre, morality, a belief in a sudden regeneration by the operation of divine grace, private meetings for religious exercises, &c., distinguished the pietists, though they never formed a separate sect. But, like the systems of so many sects, originating from a sincere desire for some better means of quenching a religious thirst than the dogmas of the established church afforded, pietism, in many cases, degenerated by degrees into an ill-regulated religious excitement. The Jansenism and quietism of France, and the Methodism of England, sprang from sources similar to those of the German pietism, and in the present struggle in Germany, between the rationalists and supernaturalists, the feelings and views of the contending parties, though their relative standing is different, are much connected with those of the pietists and the adherents to the established doctrines. See *Spener*.

PIETOLA; a village on the Mincio (q. v.), about two miles from Mantua, according to the traditions of the neighbourhood the birth-place of Virgil, which Silius Italicus calls *Andes*. A grotto in the vicinity is called *Virgil's grotto*. The French laid out a public garden here, in which they intended to erect a statue of the poet; but it was destroyed during the second siege of Mantua. The claims of Pietola to this honour are, however, rendered doubtful by the latest investigations. See *Virgil*.

PIETRO DI CORTONA. See *Cortona*.

PIGAFETTA, ANTONIO, the companion of Magellan, and the historian of his discoveries, was born at Vicenza, towards the end of the fifteenth century. Inflamed, by reading the accounts of the Spanish and Portuguese discoveries, with a desire of visiting distant parts, he studied the mathematical sciences and navigation; and when Magellan was sent out, by Charles V., to search for a western passage to the Moluccas, in consequence of the dispute between Spain and Portugal concerning the line of demarcation between their respective possessions (see *Alexander VI.*), Pigafetta obtained leave to accompany him. He sailed from Seville September 20, 1519, and returned to that port September 8, 1522, having been the first to circumnavigate the world. He kept a journal of the voyage, of which Ramusio gives an abstract in the first volume of his collection, and of which a complete edition was first published by Amoretti, who discovered a copy in the Ambrosian library.

PIGALLE, JEAN BAPTISTE, a sculptor, born at Paris in 1714, son of a carpenter, was the pupil of Lemoine and Lemayne, and, by the assistance of some friends, was enabled to visit Italy. After spending three years in Italy, he returned to France, and executed a Mercury and a Venus, which were presented to the king of Prussia (1748), by Louis XV. In 1744, Pigalle had been received into the academy of painting and sculpture, and, in 1756, he was employed to complete the monument to marshal Saxé. His reputation was now established, and Bouchardon (q. v.) instrusted to him the completion of his celebrated equestrian statue in the Place Louis XV. His last work was a girl pulling a thorn from her feet; this statue, and another representing a boy holding a cage, from which the bird had escaped, were much admired for their beauty and tenderness. Pigalle, who had been appointed sculptor to the king, and honoured with the order of St Michael, died in 1785.

PIGEON (*columba*). The domestic pigeon is supposed to be derived from the *œnas*, or stock-dove; it has been the companion of man from a very early period; the varieties, however, known to the Greeks, were very few, but were greatly increased among the Romans, with whom the breeding of these birds was quite a science. The same attention to them has continued in some modern nations, and the adepts in the art pretend that the almost innumerable varieties may be bred to a feather. The names bestowed on these varieties are indicative of their peculiarities, as, *tumblers*, *croppers*, *carriers*, *runts*, &c. In their wild state, the pigeon tribe live on high trees, generally in flocks. They feed on seed, though sometimes on fruit, retaining their food in the crop for some time. The greater proportion of the species build on elevated situations, forming a loose nest of small twigs, and wide enough to contain both sexes; the female lays two eggs, several times a year. They feed their young by regurgitating the food contained in the crop. They pair for life, though they assemble in flocks. They have no song, their note being a simple cooing. The external characters of the genus are a weak, slender and straight bill; short legs, with no distinct membrane between the toes; tail with twelve feathers; they walk well, and fly with great swiftness, continuing on the wing for a long time. They are found in every part of the world, but the species are most numerous in warm climates.

Of all the varieties of the pigeon, the most remarkable for its attachment to its native place is the messenger or carrier. This is distinguished from the others by a broad circle of naked white skin round the eyes, and by its dark blue or blackish colour. They obtained their name from the circumstance of their being used to convey letters from one place to another. The bird is brought, for this purpose, from the place where it is intended to convey the information; a letter is tied under its wing, and it is set at liberty; and, from some inconceivable instinct, it directs its flight, in a straight line, to the very spot from whence it had been taken. See *Carrier Pigeon*.

In America, there is a species of pigeons, called the passenger or wild pigeon, which abounds most prolifically. It is of a bluish-slate colour, with a while belly; the throat, breast, and sides vinaceous; tail black, of twelve feathers, five lateral whitish; the female is paler, and her breast of a cinereous brown. These birds visit the different states, in innumerable quantities, but are more abundant in the Western States. The time of their appearance in Pennsylvania is early in the spring, and again in autumn, when they pass in flocks consisting of thousands. Wilson states that these flocks are insignificant in comparison to those observed in the Western States, which abound in the favourite food of these birds. They breed there, and the same author mentions that some of the *breeding-places*, as they are termed, extend for thirty or forty miles in extent. They are taken by means of clap-nets, managed by a person concealed in a hut composed of brush-wood. In this way, ten to forty or fifty dozens are sometimes taken at a sweep. Their appearance is also a signal for a general turn out of every one that can obtain a gun. For a detailed description, see Wilson's *American Ornithology*.

PIG IRON. See *Iron*.

PIG OF BALLAST; a large mass of cast iron or lead, used for ballast.

PIG OF LEAD; the eighth part of a fodder, amounting to about 250 pounds weight.

PIGMENTS; materials used for imparting colour, whether by dyeing, painting, or otherwise. (See *Dyeing*.) The colouring substances used as paints are partly artificial and partly natural productions. They are derived principally from the mineral kingdom; and even when animal or vegetable substances are used for colouring, they are always united with a mineral substance (an earth or an oxide), because by themselves they have no body, which they acquire only by a mixture with a mineral. In painting, the colours are ground, and applied by means of some liquid, which dries up without changing them. For this purpose different fluids are employed, and the difference of the material used, with the method of employing it, has given rise to the modes of painting in water colours, oil colours, in fresco, in distemper, &c. For oil painting mineral substances are more suitable than lakes prepared with minerals, because the latter become darker by being mixed with oil. The mineral colours all consist of metallic oxides, or salts, or of combinations of sulphur. The first are less liable to change than the others. Among the metallic oxides used as pigments are minium and massicot, from lead; the ochres, burnt sienna, umber, from iron; smalt, from cobalt. Among the salts, or saline metallic combinations, are, white lead, Cremnits white, from lead; Prussian blue, from iron; verdigris, mineral green, Brunswick green, from copper. Metallic combinations containing sulphur are cinnabar (from quicksilver) and orpiment (from arsenic). The lake colours have tin or alum for their basis, and owe their tint to animal or vegetable colouring substances. Among them are the red lakes, prepared from cochineal, madder, and of inferior quality, from Brazil wood; the yellow from fustic, weld, &c.; the brown from several other colouring barks; finally, indigo, which, however, is entirely vegetable. In staining porcelain and glass, the metallic colours which are not driven off by heat, and are not easily changeable, are used. Gold containing tin gives a purple, nickel green, cobalt blue, iron and manganese black, uranium yellow, chrome green. On the subject of painters' pigments, their preparation and application, see Bouvier's *Manuel des jeunes Artistes et Amateurs en Peinture* (Paris, 1827); Tingry's *Painter's and Varnisher's Guide*.

PIGMY. See *Pygmy*.

PIKE (*esox*); a genus of fish, distinguished by having only one dorsal fin near the tail, a long, slender body, compressed laterally, and the lower jaw projecting beyond the upper. They are extremely voracious and destructive, and their digestive powers are as remarkable as their voracity: they not only feed on fish, but also destroy young aquatic birds, &c. They attain a great longevity, though many of the accounts given of the age which individuals of this genus have reached, must be received with great reservation. The common pike (*E. lucius*), when in season, is beautifully marked with a mixture of green and bright yellow spots. When out of season, however, these colours become dull. They grow to a large size, and are taken in great numbers as an article of food. Their flesh is white, firm and well tasted. They are caught either in what are termed *crown* nets, or by the hook. When the latter mode is used, the line must be very strong, and the hook fastened with wire. The bait generally used is a small fish. The Ohio pike (*E. osseus*) also attains a very large size, and is exceedingly abundant in the western rivers and lakes.

PIKE. The pike, in the middle ages, with the cross-bow, sword and battle-axe, formed the chief weapons of the infantry. The pike was from sixteen to eighteen feet long, consisting of a pole with an iron point. See *Lance*.) Men armed with it were called *pike-men*. After the invention of guns, they gradually fell into disuse, and, in fact, can hardly be considered very effective arms in modern warfare, unless in the hands of excited insurgents, or of people, fighting for their liberty, when every species of arms is effective, even flails and staves, wielded by monks. The Prussian *Landsturm* was armed with pikes in 1813, to be used in case no better arms were to be had. The Swiss first substituted the halberd for the pike, towards the fifteenth century. For some time, every company in the armies of Europe consisted of at least two thirds pike-men, and one-third harquebussiers. Gustavus Adolphus, the great improver of the modern art of war, about 1630, omitted the pike-men in some regiments entirely. The invention of the bayonet drove it still more out of use.

PILASTERS. See *Architecture*.

PILATE, PONTIUS, the successor of Valerius Gratus in the government of Judea, A. D. 27. He is said to have been born in Spain. Pilate was procurator, or præpositus, of Judea (Suetonius, *Vespasian*, 4), and, as was sometimes the case in a small province, or in a part of a large province, discharged the office of a governor; hence he had the power of punishing capitally (Tacit. *Annal.*, xii., 23), which procurators did not usually possess, although Judea was a part of the province of Syria. He endeavoured to introduce the Roman standards with the image of the emperor into Jerusalem, in violation of the Jewish usages, attempted to get possession of the treasure of the temple, and put to death some Galileans in the midst of the sacrifices—an act which brought upon him the hostility of Herod, tetrarch of Galilee. When Christ had been condemned to death by the Jewish priests, who had no power of inflicting capital punishments, he was carried by them to Pilate to be executed. Pilate, seeing nothing worthy of death in him, sent him, as a Galilean, to Herod, who, however, sent him back to Pilate. Yielding to the clamours of the Jews, the Roman governor finally ordered Jesus to be executed, but permitted Joseph of Arimathea to take his body and bury it. Pilate was afterwards removed from his office by Vitellius, prefect of Syria (A. D. 37), and, according to tradition, was banished by Caligula to Gaul, where he is said to have died, or committed suicide, at Vienne, A. D. 40. The Scala Santa, near the church of Santa Croce, in Rome, is said to be formed of the twenty-eight steps of the marble palace of Pilate, and the devout therefore ascend it only on their knees. In the church itself is shown the inscription in Greek, Hebrew and Latin, placed by Pilate on the cross. It is written with red lead on cedar wood

PILATRE DE ROZIER. See *Aëronautics*.

PILCHARD (*clupea pilchardus*); a species of fish resembling the herring, not only in form, but also in its migrations and stated returns. It is about nine inches in length, with large scales: the back is bluish, and the sides and belly silvery; the head is compressed, and the mouth without teeth. The upper angle of each of the gills is marked with a large black spot. These fish annually appear on the English coast during the summer, and are taken in immense quantities. The statements of the numbers caught at one time are almost beyond belief; thus it is said that, in 1767, there were at one time enclosed in the bay of Ives, in Cornwall, 7000 hogsheads, or 2,450,000. The average amount of the export of these fish from England is about 30,000 hogsheads. In some years, so few pilchards visit the coast, that great distress is occasioned among the fishermen, who mainly depend on the capture of these fish for subsistence. The dog-fish (a species of shark) are great enemies of the pilchards, following the shoals, and devouring them in amazing numbers.

PILES. See *Hemorrhoids*.

PILGRIMAGES. To visit places or objects with which interesting associations are connected is natural to every age and people. Athens or Rome, the ruins of a feudal castle, or the graves of the great or the beloved, attract our steps and awaken our sensibilities. The livelier the susceptibility, the greater will be the interest. In ages, therefore, in which feeling predominates over reason, this interest will be greater than in calmer times. In early nations, therefore, we find a strong disposition to visit places which are hallowed by religious associations. In some religions, however, this trait appears stronger than in others, and the visiting of holy places is made an act of particular merit. The injunction of pilgrimages is common in the religions of the East. How important an event is the pilgrimage to Mecca in the life of a pious Mohammedan? (See *Kaaba*, *Mecca*, *Hadjy* and *Mohammed*.) With the Christians, pilgrimages became more frequent as more honour was paid to the relics of martyrs or saints; and the simple piety of the early devotees was particularly gratified by visiting the sepulchre of the Saviour, and the spots where he had lived, taught, and suffered. The Saracens permitted the Christian pilgrims to visit the holy sepulchre without molestation; but when the rude Turks took possession of Palestine, it was very different, and the repeated complaints of pilgrims returning from Jerusalem occasioned the excitement which led to the crusades. Pilgrimages were performed in the middle ages to many different places. Some spots, however, attracted a much larger concourse than others, the credulity of the time associating with them peculiarly great or numerous miracles, or peculiarly extensive indulgences being granted to the pilgrims who visited them. This was the case, for instance, with Rome, Compostella and Tours. Pilgrimages were, in fact, so common, that the learned Ruhs considers them as a great means of communication between the various nations of the middle ages, and as having promoted the diffusion of many arts and improvements of various kinds, at a time when travelling was dangerous, when no newspapers existed, and, in fact, the peaceful intercourse of nations was so little developed. The following instance will show to what extent pilgrimages were performed. In 1428, in the reign of Henry VI., there went to the shrine of St James of Compostella, in Spain, from London 280 pilgrims, from Bristol 200, Weymouth 122, Dartmouth ninety, Yarmouth sixty, Jersey sixty, Plymouth forty, Exeter thirty, Liverpool twenty-four, Ipswich twenty—in the whole, 926 pilgrims from eleven towns. Catholics still continue to make pilgrimages, but by no means to the same extent as formerly, in times of less reflection and more enthusiasm. Governments, however, have discouraged the concourse of Pilgrims, particularly assemblages of several days' continuance, which still exist in some instances. The licentiousness which Burckhardt describes as prevailing among the pilgrims to Mecca (see *Kabba*) agrees perfectly with what is known of the general pilgrimages of Christians. Pilgrims still continue to travel to Rome, where they are provided for in establishments founded by pious persons. The last numerous assemblage of pilgrims at Rome was in the year 1825, when pope Leo XII. proclaimed a jubilee. See *Jubilee*.

PILLAU; a seaport of East Prussia, eight leagues from Königsberg, at the southern extremity of a narrow peninsula formed by the Baltic and the Frische-Haff; lat. N. 54° 33' 39"; lon E. 19° 55'. The port is safe and commodious, and all vessels going to Königsberg or Elbing stop here. A fort protects the place; 4518 inhabitants. Much fishing is carried on here.

PILLNITZ; a palace of the king of Saxony, on the right bank of the Elbe, two leagues south of Dresden. The court remains here annually for some time. Its situation is very beautiful. In history, Pillnitz is famous for a meeting of the emperor Leopold II., Frederic William II. of Prussia, the count of Artois, the ex-minister Calonne, and several other personages, from August 25 to 27, 1791. A treaty of offensive alliance was not concluded, but preliminaries were agreed on for a defensive alliance, between Austria and Prussia, which was settled at Berlin, Feb. 7, 1792. The brothers of the king of France received, Aug. 27, only an assurance from Prussia and Austria, that they hoped all the powers whose assistance had been asked for would be ready to contribute, according to their means, to restore the royal family, and to establish a government founded on the rights of sovereigns, and the welfare of the people, in which case Austria and Prussia would join them. In the mean time, they would give orders that their troops should hold themselves in readiness to act. Six secret articles are also said to have existed. (See Schöll's *Histoire des Traités* *de Paix*, vol. iv.) The French considered the Pillnitz convention as the basis of the coalition of Europe against France, which greatly irritated them.

PILLORY ; a frame of wood erected on posts, with movable boards, and holes through which were put the head and hands of a criminal for punishment. In this situation criminals in Britain were formerly often exposed to the outrages of the mob in a way inconsistent with any rational notions of punishment. Those who were offensive to the crowd were in no small danger from the missiles by which they were assailed. The culprit was allowed to make speeches, defending himself and attacking his enemies. In 1816, this punishment was abolished in all cases except that of perjury, and it has now altogether fallen into dissuetude.

PILLOW ; a block of timber whereon the inner end of the bowsprit is supported.

PILOT MOUNTAIN. See *Ararat*.

PILPAY, OR BILPAI, a fabulist, is said to have lived 400 years before Christ, and to have written, by the order of king Dabschlim, a well known collection of interesting narratives and apologues, in the Indian language, under the title of *Kalila and Dimnah*, which, in ancient and modern times, has met with general approbation, and has been translated into most of the Eastern and Western languages. But it has been shown by Beigel, in Ideler's work On the Names of the Stars, p. 366, that this account of the author is entirely erroneous, and that the name *Pilpay* originated from the Sanscrit word *hitopadesa* (useful instruction), which is the title of the work in the Sanscrit edition (Serampore ,1804, 4to ; London, edited by Wilkins, 1808, 4to.). Silv. de Sacy has published a fine edition of the Arabic, with a French translation (Paris, 1816, 2 vols). Wilkins translated the Sanscrit original into English (London, 1787.)

PIMELITE ; a variety of clay coloured by oxide of nickel.

PIMENTO. See *Allspice*.

PIN ; in commerce, a little necessary instrument made of brass wire, chiefly used by women in adjusting their dress. When the wire is received at the manufactory, it is wound off from one wheel to another, and passed through a circle of a smaller diameter in a piece of iron. Being thus reduced to its proper size, it is straightened by drawing it between iron pins, fixed in a board in a zigzag manner. It is afterwards cut into lengths of about four yards, and then into smaller pieces, every length being sufficient for six pins. Each end of these is ground to a point by boys, each of whom sits with two small grindstones before him, turned by a wheel. Taking up a handful, he applies the wires to the coarsest of the two stones, moving them round, that the points may not become flat. He then gives them a smoother and sharper point on the other stone: a lad of twelve years of age can point 16,000 in an hour. When the wire is pointed, a pin is taken off from each end, till it is cut into six pieces. The next operation is to form the heads, or *head-spinnings*, as they are termed : this is done by a spinning wheel. One piece of wire is with rapidity wound round another; and the interior one being drawn out, leaves a hollow tube between the circumvolutions. It is then cut by shears, every two turns of the wire forming one head. These are softened by throwing them into iron pans and placing them in a furnace till they are red hot. As soon as they are cold, they are distributed to children, who sit with anvils and hammers before them. These they work with their feet by means of a lathe. They take up one of the lengths, and thrust the blunt end into a quantity of the heads which lie before them ; catching one at the extremity, they apply it immediately to the anvil and hammer, and by a motion or two of the foot, the point and the head are fixed together in much less time than can be described, and with a dexterity that can only be acquired by practice. The pins are thrown into a copper containing a solution of tin and wine lees. Here they remain for some time, and when taken out, their brass colour has become changed to a dull white. In order to give them a polish, they are now put into a tub containing a quantity of bran, which is set in motion by turning a shaft that runs through its centre, and thus, by means of friction, the pins become entirely bright. They are now separated from the bran, which is performed by a mode exactly similar to the winnowing of corn ; the bran flying off and leaving the pin behind it fit for sale.

PINANG. See *Prince of Wales's Island*.

PINCHBECK ; an alloy of copper, in which the proportion of zinc is greater than in brass.

PINDAR ; one of the most energetic and sublime poets of Greece. He sang the praises of the victors in the Grecian games,—those public festivals in which the most distinguished men, even kings, competed. Not only the conquerors and their fellow citizens, but all assembled Greece was celebrated in his poems, and thus they were soon spread wherever the Greek language was spoken. To understand Pindar, it is necessary to be intimately acquainted with Greek antiquities. In the judgment of the best critics, his poems belong to the most beautiful remains of ancient literature. Forty-five are still extant, fourteen in celebration of Olympic victors, twelve of Pythian, eleven of Nemæan, and eight of Isthmian. They are all written in the Doric dialect. Of the editions of Pindar, the following deserve to be recommended :—the edition of West and Welsted (Oxford, 1697, fol.), of Heyne (latest 1817, 3 vols.), and of Bockh (Leipsic, 1811, 3 vols., 4to.). Some of the odes have been translated by Gilbert West.—Pindar was born in Bœotia, in or near Thebes, in the sixty-fifth Olympiad, about 520 B. C. His father was a flute-player, and he is said to have been himself a masterly performer on the lyre. At an early age, he was instructed in music and poetry ; and for the development of his poetical talent he was especially indebted to the beautiful Corinna, who was herself a distinguished poet, and is said to have obtained the prize more than once in the poetic competition with her friend. Little else is known with certainty of his life; even the date of his death is doubtful : according to some, he died in his sixty-fifth year, according to others, he lived to the age of eighty or ninety. His reputation was so great that Alexander, notwithstanding his exasperation against the Thebans, spared the house in which Pindar had lived, when the city was destroyed. The same had been done by the Spartans when they entered Thebes in triumph. Even in his lifetime, his fellow citizens are said to have erected a statue in his honour.

PINDAR, PETER. See *Wolcot*.

PINDAREES (that is, *freebooters*); the name given in British India to the hordes of mounted robbers who, for several years (since 1812), infested the possessions of the East India company. In the autumn, when the Nerbudda is so low that it is fordable by cavalry, they entered into the rich territory of the company, devastated the country, and carried off the spoils to their mountains. These freebooters had existed since 1761, but made themselves particularly formidable in the nineteenth century. They were descended mostly from the caste of Mohammedan warriors, which formerly received high pay from the Indian princes. But the British East India company disarmed many of the tributary native princes, and maintained under the command of the

British residents at the Indian courts large bodies of mercenary troops, which the mediatised nabobs were obliged to pay. The number of the Pindarees was thus increased, and they were secretly excited by the Indian tributaries to attack the company. In 1817, the British governor-general, the marquis of Hastings, determined on the destruction of these robbers, whose force was estimated at 40,000 horse. Attacked on all sides, they were conquered and dispersed. Garrisons were placed in some fortresses, and hostages taken to Calcutta; their other strong places were demolished. A flying party of seapoys was kept without intermission on the right bank of the Nerbudda, &c. At last, a moderate yearly tribute was imposed on the subjected tribes. The East India company has followed the rule of increasing their revenue, territory and troops, after every war, at the expense of the vanquished, so that the subjected princes have seldom ventured to break a second lance with the British governor-general.

PINDEMONTE, Cavaliere Ippolito, an Italian poet, was born at Verona, in 1753, and, at the age of eighteen years, distinguished himself by his poetical productions. Having travelled through Italy, France, and Britain, he preserved the impressions made on him by his journey in his *Viaggi*. In his *Poesie Campestri*, he speaks with enthusiasm of British scenery and life. His *Arminio*, a tragedy founded on the death of Arminius, contains choruses of warriors and virgins which are models of style. His lyric poems are among his best works, and display a depth of thought and feeling with which the author seems to have been inspired by British literature. Besides translations from Homer, Virgil, Ovid and Catullus, his *Fata Morgana*, *Elogia di Gessner*, and *Il Colpo di Martello*, are worthy of notice. Pindemonte lived at Venice, and died in 1828.—His brother, the marquis *Giovanni Pindemonte* (born 1751, died 1812), was the author of some dramatic works—*Componimenti Teatrali*—and translated Ovid's *Remedia Amoris*.

PINDUS; a mountainous ridge in Greece, between Thessaly, Macedonia, Epirus and Ætolia. It was, like Helicon and Parnassus, a seat of Apollo and the muses. (See *Æta*.) It is now called *Mezzovo*.

PINE. A genus of plants, the principal one of the *coniferæ*, consisting of lofty evergreen trees with acicular leaves, and their branches disposed in a verticillate form. The flowers are monœcious, and the fruit is a cone, having the seeds attached to the inside of each scale. The pines, together with the spruces and larches, form the most striking feature in the vegetation of temperate climates, and are, besides, among the most useful of the products of the vegetable creation. Formerly these three genera were united; but the true pines are readily distinguished by having their leaves, to the number of two, three, or five, united at base in a cylindrical membranous sheath. About thirty species are known.

The red Canadian pine (*pinus resinosa*), a northern species, inhabiting the whole of Canada from the Atlantic to the Pacific, and also found in the northern and eastern parts of the United States, is rare on the coast south of the forty-third parallel of latitude, and even on the mountains has not been hitherto observed beyond the forty-first. In Canada and Nova Scotia it is called *yellow pine*—it is sometimes also improperly termed *Norway pine*. Even in those districts where most common, it does not constitute a large proportion of the forest, but occupies small tracts of a few hundred acres, where the soil is dry and sandy, and grows either alone or in company with the white pine. The trunk rises to the height of seventy or eighty feet by about two in diameter at base, and is chiefly remarkable for its uniform size for two thirds of its length: the bark is of a clearer red than in any other of our pines; the leaves are in pairs, and are collected in bunches at the extremity of the branches; and the scales of the cones are unarmed—a character which serves to distinguish it from allied species. The wood is compact and fine-grained, rendered heavy by resinous matter, and is highly esteemed for its strength and durability. In the British provinces and in Maine, it is frequently employed in naval architecture, especially for the decks of vessels, furnishing planks free from knots, of forty feet in length. It is also used for masts, and has furnished the main-mast of a fifty-gun ship. It is exported to Britain, both from Maine and from the St Lawrence. When young, it is a beautiful tree, and the vegetation is always vigorous.

The scrub pine, or gray pine (*P. banksiana*) is a dwarf species, from three to ten feet high, unimportant in a useful point of view.

The true yellow pine (*P. variabilis*) rises to the height of fifty or sixty feet, by fifteen or eighteen inches in diameter at base, and sometimes more: the leaves are four or five inches long, and are usually in pairs, but sometimes in threes on the younger shoots; the cones are small, oval, and armed with fine spines. The heart is fine-grained, compact, moderately resinous, and is highly esteemed for its excellence and durability. Immense quantities are used in naval architecture at New York, Philadelphia, and Baltimore, for decks, masts, yards, beams and cabins, and it is considered next in durability to the long-leaved pine: it is, besides, employed for various mechanical purposes. Turpentine and tar may be obtained from the tree, but in too small quantities, and with too much labour to yield a profit.

The Jersey pine (*P. inops*), has received this appellation from being most abundant in the lower part of New Jersey, where it grows in company with the yellow pine. This is a small tree, rarely attaining the height of thirty or forty feet, with a diameter of a foot at base. The leaves are in pairs, one or two inches long, and the cones are armed with strong spines. The trunk is too small to be of any utility in the arts, and, besides, consists of a great proportion of sap.

The pitch pine (*P. rigida*) is most abundant along the Atlantic coast, where the soil is diversified, but generally meagre. The ridges of the Alleghanies in Pennsylvania and Virginia are sometimes covered with it, and in some parts of the latter state it has received the name of *black pine*. The forty-fifth degree of latitude appears to be its northern limit. It is frequently seen in large and miry swamps, and in such situations attains the height of seventy or eighty feet by two in diameter at base; and it appears to support the presence of sea-water better than any other pine. The leaves are in threes, varying much in length, as do the cones in size; the latter are armed with acute spines. The branches are very numerous, and occupy two-thirds of the trunk, which renders the wood extremely knotty. The quality of the wood varies according to the situation; in swamps it is light, soft, and consists of a greater proportion of sap, but in a dry, gravelly soil it is compact, heavy, and contains a large proportion of resin. These defects render it much inferior to the yellow pine; but, as this is becoming scarce, it takes its place for some purposes.

The loblolly pine (*P. tæda*), often exceeds eighty feet in height, with a wide spreading summit, and, next to the white pine, is the loftiest of our species. The leaves are six inches long, united by threes, or sometimes fours, on the young and vigorous shoots. The cones are four inches long, and armed with strong pines. The wood consists of a still larger proportion of sap than any above-mentioned; trunks of three feet diameter having hardly six inches of heart; but, notwithstanding, it is even used for ground floors, although the boards, which are only four inches wide, shrink and become uneven. As the timber decays speedily on being exposed to the air, this is to be regarded as one of the least valuable of the pines.

The long-leaved pine (*P. palustris*) is, perhaps, the most important of all forest trees. Not only does it furnish resin, tar, pitch, and turpentine, but the timber is hardly inferior to the white oak in naval architecture, and, moreover, the tree grows only in a soil so sterile as to be incapable of being converted to any other use. It is known in commerce under a variety of names; in those districts where it grows, it is called *long leaved pine*, *yellow pine*, *pitch pine*, and *broom pine*; in Britain, *Georgia pitch pine*. It usually grows to the height of sixty or seventy feet, with a trunk fifteen or eighteen inches in diameter for two-thirds of this height. The cones are very large, seven or eight inches long, by four in diameter, are armed with small spines, and contain seeds of an agreeable flavour. The unusual length of the leaves, about twelve inches, gives this tree a peculiarly striking appearance. The trunk contains but little sap, and the concentrical circles are close and at equal distances, while the resinous matter is abundant and equally distributed, which renders the wood stronger, more compact and more durable than in the other species: it is, besides, fine-grained and susceptible of a brilliant polish, and is applied to a great variety of uses. That variety which acquires a reddish hue from growing in certain soils, and is known by the name of *red pine*, is most esteemed, and, in the opinion of some shipwrights, is as solid and durable on sides of vessels as the white oak, but is said to form less perfect joints at stem and stern.

The white pine (*P. strobus*) is the loftiest tree in the United States of America, and its timber, though not without essential defects, is consumed in much greater quantities, and for a far greater variety of purposes, than any other. It attains the height of 150 feet, and even more, with a trunk five and upwards in diameter: the leaves are united by fives, and the cones are four or five inches long, pendulous, and have thin, smooth scales. Owing to the lightness and delicacy of the foliage, the young trees make an elegant appearance. It is most abundant between the forty-seventh and forty-third parallels of latitude, and along the Alleghanies to their south-western termination. The wood has little strength, gives a feeble hold to nails, and is liable to swell from humidity in the atmosphere; but, on the other hand, it is soft, light, free from knots, easily wrought, durable, and furnishes boards of great width, and, above all, is still abundant and cheap. It receives gilding well, and is selected for looking-glass and picture frames. It is employed for masts, and great numbers of these masts are exported to Britain, and are said to be lighter than the Riga masts, but have less strength: the bowsprits and yards of men-of-war are also of white pine. The persons engaged in procuring white pine lumber, after having previously ascertained where the trees abound, in the beginning of winter enter the forests, and establish themselves in huts covered usually with birch bark, although the cold is frequently most intense. When the trees are felled and cut into logs, by means of their cattle they drag them to the nearest river, after fixing upon them a mark of property. At the breaking up of the ice, the logs float down the current till they arrive at their destination. If stripped of their bark, logs will remain uninjured for many years: otherwise they are liable to be destroyed by worms.

The *pinus flexilis* is remarkable for the flexibility of the branches, which are numerous, recurved, and form a large dense top. The leaves are in fives, like those of the white pine, and the seeds are used for food by the Indians.

The *pinus lambertiana* is a species of gigantic size, growing between the fortieth and forty-third parallels of latitude, and about one hundred miles from the Pacific. Like most of the pines, it is found in a sandy soil; but it does not form dense forests, and is scattered singly over the plains among other species. The trunk rises from 150 to upwards of 200 feet in height, and is from 7 to nearly 20 feet in diameter. It is remarkably straight, and is destitute of branches for two-thirds of its height. The leaves are in fives, and the cones are pendulous at the extremities of the branches, and require two years to attain their full growth, when they are upwards of a foot in length, and nearly four inches in diameter at the thickest part. The timber is white, soft and light, and produces abundance of a pure amber-coloured resin, which, when the trees are partly burned, acquires a sweet taste, and in this state is used by the natives as a substitute for sugar. The seeds are eaten either roasted, or pounded into coarse cakes for use during the winter season. This species resembles most the white pine, but is very different in habit, and in the parts of fructification.

Among the more interesting of the species is the wild pine or Scots fir of Europe. The trunk attains the height of eighty feet and upwards, by four or five in diameter, and the timber is applied to a great variety of uses, and especially is excellent for masts. These, together with the timber in other forms, are exported from Riga, Memel, Dantzic, and other parts of the north to the other maritime states of Europe, and particularly to Britain. Large vessels, and even frigates, have been constructed of this pine; but they are not so durable as those built of oak. In those districts where it abounds, houses, as well as furniture, are generally constructed of it, and it furnishes excellent charcoal for forges; but a more important product is the resinous matter, consisting of tar, pitch and turpentine, of which articles it supplies four-fifths of the consumption in the European dock-yards. This pine has, besides, the advantage of growing in extremely different soils and exposures. The name of *red*, or *yellow deal*, is given in Britain to its wood, while the wood of the Norway fir (*pinus picea*) is called *white deal*.

The *P. maritima* grows in the south of Europe, and is useful on account of its yielding resinous products and lampblack.

The stone pine (*P. pinea*) is a Mediterranean species, chiefly remarkable on account of the seeds, which have an agreeable flavour, analogous to that of almonds, and frequently make their appearance upon the table. They are three years in ripening. The trunk rises to the height of fifty or sixty feet, with a diameter at base of fifteen or twenty inches. The wood is useful for carpenter's work, &c., and, according to Olivier, is the only kind employed by the Turks for masts.

Pine forests are extremely liable to be frequently ravaged by fire; and from their great combustibility it is extremely difficult to arrest the progress of the flames when once they have gained footing. In some parts of France, the following method is practised with success:—If a fire breaks out in the forest, a second is kindled at a point directly opposite, when a current of air sets from the first to the second, which carries the flames to a common centre, leaving the surrounding woods uninjured.

PINE-APPLE (*bromelia ananas*). This fruit, usually pronounced the first in the world, was originally found by the Europeans in Peru, and has not been known in Europe above two centuries. It passed from Brazil to the West Indies, and thence was transported to the East Indies, where it has long been successfully cultivated. The leaves are canaliculate, and spiny on the margin; the stem erect, and about two feet high; the flowers blue, and united in a dense spike, which is crowned at the summit with a tuft of leaves; the berries, in ripening, unite, and give to this spike somewhat of the form of a pinecone, but it is much larger. The seeds have been rendered abortive by cultivation. The pine-apple is most readily reproduced by planting the terminal tuft of leaves; but, in our green-houses, it is far inferior to the tropical fruit, and yet is very generally cultivated in many parts of Europe, especially near the larger cities. In one or two of the southern provinces of Spain, it is raised in sheltered situations in the open air. Many varieties of the pine-apple have been produced, but they may be referred to seven principal ones. Some of the other species of true *bromelia* have crowns, and the fruit of most of them, though small, is eatable. The *B. pinguin* has the fruit separately in clusters, and not in a cone, and the leaves afford a fibre, which is manufactured into cordage, or sometimes into good cloth. From the pine-apple is made very good wine, which turns in about three weeks, but recovers by longer keeping. The fruit is also sometimes preserved entire, and, when taken out of the sirup, is iced with sugar.

PINEL, Philip, member of the institute, and of the legion of honour, the Howard of the insane, was born in 1745, at St André, in the department of the Tarn, studied at Toulouse, and Montpellier, where he supported himself by teaching mathematics. In 1778, he went to Paris, and at first applied himself to the study of the sciences connected with medicine, but afterwards devoted himself entirely to that science itself. In 1791, he was made directing physician at the Bicetre, an insane hospital, and, in 1794, at the Salpétrière. The harsh treatment of the insane then in vogue, their chains and unhealthy dungeons, filled him with horror. He introduced gentle treatment, uniting firmness with kindness, and was the first definitely to recommend moral remedies (in his work *Sur l'Aliénation mentale*), and one of the earliest to establish a regular police in the mad-houses. He also proved the existence of what he called *manie sans délire*. He placed less stress on physical treatment, and, in particular, he agreed with Bordeu in condemning blood-letting. In general, he recommended delay. "What art cannot effect," he used to say, "time may accomplish." His pathology was founded on Condillac's system of philosophy, and was directed more to a consideration of the obvious phenomena than to a thorough insight into the nature of diseases; yet his *Nosographie philosophique* (Paris, 1798; 6th ed. 1818) formed an epoch in French medicine, as it supplied a want then generally felt. In many respects, Pinel is to be considered as the precursor of Bichat, since he was the first to point out the physiological and pathological difference of the various textures. He edited, for some time, the *Gazette de Santé*, and was a collaborator in Fourcroy's *Médicine éclairée par les Sciences physiques*, and in the great *Dictionnaire des Sciences médicales*. In the time of terror, Pinel concealed the unfortunate Condorcet in his house. In 1823, when the school of medicine was reformed by the government, M. Pinel was removed from his post on suspicion of entertaining liberal principles; and he died three years later, at the age of eighty-one years.

PINGRE, Alexandre Gui, canon of the congregation, and librarian of Ste. Géneviève, astronomer and geographer to the marine, and member of the academy of sciences at Paris, was born in Paris, in 1711. He distinguished himself at first as a theologian, particularly in the Jansenistic controversy; but, at the age of thirty-eight, he was induced to devote himself to astronomy, for the purpose of fitting himself for the place of astronomer to the academy of sciences at Rouen. His observations here caused him to be chosen correspondent of the Paris academy, in 1750, and, in 1751, he was called to Paris by its order, to erect and superintend an observatory. Here he continued his observations for forty years, and published an astronomical nautical almanac from 1754 to 1757. In 1756, he became *associé* of the academy, whose Transactions, from 1753 to 1770, contain numerous papers by him. In 1757, he entered upon one of the most difficult of astronomical labours, the theory and calculation of comets—and calculated the paths of more comets than all the other astronomers of Europe together. In 1766, he calculated the eclipses of the sun and moon for a period of 2000 years, for the second edition of the *Art de vérifier les Dates*, with a greater degree of accuracy than Lacaille had done. In 1767, he accompanied Courtanvaux on a voyage, to try the chronometers of Leroy and Berthoud, and made a report on the subject. In 1769, he made a second voyage with Fleurieu for the same purpose, and, in 1771, a third with Borda. In 1769, he observed a passage of Venus over the sun's disk at cape François (he had been prevented from observing a previous passage, in 1761, by the state of the weather). In 1783 appeared his *Cométographie*. In 1790, he completed his History of Astronomy during the Seventeenth Century, and, in 1786, he published a translation of the astronomical poem of Manilius. He died in May, 1796.

PINGUIN (from *pinguis*, fat), more commonly called Penguin (*aptenodytes*); a genus of birds exclusively found in the Antarctic seas. Their feet are placed more posteriorly than in any other birds, and only afford them support by resting on the tarsus, which is enlarged like the sole of the foot of a quadruped. The wings are very small, and are furnished with rudiments of feathers only, resembling scales. Their bodies are covered with oblong feathers, harsh to the touch, and closely applied over each other. These, with a thick coat of fat, preserve the penguins from the severity of the cold. The water is the natural element of these birds: on land, their motions are slow and awkward, and, from the form of their wings, or rather fins, they cannot fly. While in the water, they move with great alertness and rapidity. They principally feed on fish. The female lays from one to three eggs, forming a rude excavation or burrow in the sand, instead of a nest, and it is only during the period of incubation that they are to be found on shore: at all other times, they live entirely on the water. The largest species is the *A. magellanica*, or great magellanic penguin, which is perhaps the most awkward and ill-shaped of the genus; for, although not more than two feet in length, their bulk is sometimes so great that they weigh from thirty to forty pounds. They derive their name of *penguin* from their excessive pinguitude, or fatness. The birds which Buffon has distinguished by this name belong to a different genus, namely, *alca*, and are known among British naturalists by the appellation of auk. They are principally natives of the northern hemisphere, particularly of the Faroe islands.

PINION, in mechanics; an arbour or spindle, in the body of which are several notches, which catch the teeth of a wheel that serves to turn it round; or it is a lesser wheel that plays in the teeth of a larger one.

PINITE is a crystallized earthy mineral, found in granite and porphyry. Its form is that of a six-sided prism, usually much rounded on the lateral edges;

colour greenish black and gray; dull, soft, and emitting an earthly odour when moistened. It consists of silex 29.5, alumine 63.75, and oxide of iron 6.75. It is found in several European countries, and in the United States, at Haddam, Connecticut, in granite, and at Lancaster, in Massachusetts, in quartz veins in argillite.

PINK (*dianthus*); a beautiful and favourite genus of plants, belonging to the *caryophyllcæ*. More than one hundred species are known, all, with perhaps one or two exceptions, natives of the northern and temperate parts of the Eastern continent. Their roots are annual or perennial; the stems herbaceous and jointed; the leaves opposite and entire, and the flowers terminal, aggregate, or solitary, and always beautiful. Many are common in gardens; and perhaps no plant is more highly esteemed by the florist than the carnation, both for its beauty and its rich spicy odour. It is the general favourite in Germany and Italy, and nearly 400 varieties are enumerated.

PINK; a vessel masted and rigged like other ships, only that this is built with a round stern, the bends and ribs compassing so that her ribs bulge out very much. This renders the pinks difficult to be boarded, and also enables them to carry great burdens, for which purpose they are often used.

PINKERTON, John, F. S. A., an eminent antiquary, was born in Edinburgh, 1758, and was articled to a writer to the signet, in whose office he continued five years. In 1780, he went to London, where he published an octavo volume of miscellaneous poetry, under the title of Rhymes, with dissertations On the Oral Tradition of Poetry, and On the Tragic Ballad, &c. His Essay on Medals (1784, 2 vols., 8vo) has since gone through two other editions. Among his other works are Letters on Literature, published in 1785, under the assumed name of Heron, which obtained him the acquaintance of Horace Walpole, after whose decease he published Walpoliana; Ancient Scottish Poems, from the (pretended) Manuscript Collection of Sir Richard Maitland, with Notes and a Glossary; Dissertation on the Origin and Progress of the Scythians or Goths; the Medallic History of England (4to); Scottish Poems, reprinted from scarce Editions (3 vols., 8vo); Iconographia Scotica, with Notes (2 vols., 8vo, 1795—1797); Modern Geography, digested on a new Plan (2 vols., 4to, 1802; reprinted 3 vols., 1807); General Collection of Voyages and Travels (19 vols., 4to), &c. He died at Paris, March 10, 1826.

PINKNEYA PUBESCENS, or GEORGIA BARK; a small tree, closely resembling the cinchona, or Peruvian bark, and said to possess the same febrifuge qualities, growing wild in the southern parts of Georgia. It rarely exceeds twenty-five feet in height, by five or six inches in diameter at base; the leaves are opposite, five or six inches long, oval, and acute at each extremity; the flowers are pretty large, white, with longitudinal stripes of rose-colour, and are disposed in beautiful clusters at the extremities of the branches; each flower is accompanied with a floral leaf, bordered with rose-colour near the upper margin; the corolla is tubular; the stamens five, with a single style; and the capsule contains two cells and numerous seeds. The wood is soft and unfit for use in the arts. The inner bark is extremely bitter, and is the part employed with success in intermittents.

PINNACE; a small vessel used at sea, with a square stern, having sails and oars, and carrying three masts, chiefly employed to obtain intelligence and to land men, &c. One of the boats of a man-of-war, used to carry the officers to and from the shore, is also called the *pinnace*.

PINT. See *Measures*.

PINTO-MENDEZ. See *Mendez-pinto*.

PINTURICCHIO, Bernardino, an eminent painter of the Roman school, the disciple of Pietro Perugino, was born at Perugia, in 1454. He painted chiefly in history and grotesque; but he also excelled in portraits. His chief work was the history of pope Pius II. in ten compartments, in the library at Sienna. Others consider his work in the cathedral of Sospello his best performance. His style was effective, but he made use of too splendid colours, and introduced abundance of gilding. He is said to have died of chagrin at the following circumstance: Being engaged to paint a Nativity for the monastery of St Francis, at Sienna, he pertinaciously insisted that every thing should be removed out of the room in which he worked, and obliged the monks to remove a great chest, become rotten from age. In the attempt it burst, and discovered a hoard of 500 pieces of gold, to the great joy of the fathers, and the mortification of Pinturicchio. His death took place in 1513. He generally executed compositions of Perugino and Raphael, and received a third of the pay.

PIOMBINO; a principality of Tuscany, lying between Sienna and the Mediterranean, opposite the island of Elba, from which it is separated by the channel of Piombino. The capital, of the same name, has a population of 4150; population of the principality is 17,775; 210 square miles. Piombino was formerly a sovereign principality, to which belonged the island of Elba; but, in 1804, Napoleon granted it to his sister Eliza (see *Bacciocchi*), and, in 1815, it was annexed to Tuscany. See *Tuscany*.

PIOMBO, Sebastiano del; a celebrated painter, born at Venice, in 1485. His family name was *Luciani*. Having renounced music, of which he was very fond, for painting, he studied at first under Giovanni Bellini, and afterwards under Giorgione, whose fine colouring he imitated. Sebastiano commenced as a portrait painter, and the reputation which he soon gained in that branch induced Agostino Chigi, a rich merchant of Sienna, to take him to Rome and employ him in ornamenting his house. The delicacy of his pencil was much admired, and Michael Angelo, who seems to have been somewhat jealous of the growing fame of Raphael, encouraged him to enter into competition with that master, and even supplied him with designs, which Piombo often executed very happily, although by no means capable of lofty conceptions or sublime inventions. When Raphael had painted his celebrated Ascension, Sebastiano was induced by Michael Angelo to attempt to surpass it by the Raising of Lazarus, which is considered his greatest work. His Martyrdom of St Agatha was also ranked among the pieces of the first masters. His chief merit, however, lay in single figures and portraits. His Pietro Aretino and his Clement VII. were admirable likenesses, and specimens of perfect colouring. He was high in favour with Clement, who created him keeper of the papal seals. From this circumstance he derived his surname *Del Piombo*, the seals attached to the papal bulls being, at that time, of lead (*piombo*). This post made it necessary for him to assume the clerical habit, and from that time, he painted but little. He wrote verses, entertained learned men at his table, and only occasionally painted a portrait. He died in 1547. It also deserves to be mentioned, that he invented a peculiar method of painting in oil on walls, in which manner there is a Scourging of Christ to be seen in S. Pietro in Montorio.

PIONEERS; labourers attached to an army for the making and repairing of roads, and performing all labours connected therewith, digging trenches, &c. In several armies they are united with the sappers and pontoniers. See *Ponton*.

PIOZZI, Hester Lynch, an English authoress, born in 1739, was the daughter of John Salisbury, of

Carnarvonshire. Early in life, she was distinguished in the fashionable world by her beauty and accomplishments. In 1763, she was married to Henry Thrale, a brewer of great opulence in Southwark, which borough he then represented in parliament. Soon after commenced her acquaintance with doctor Johnson, of whom she published Anecdotes, in one octavo volume (1786). Mr Thrale dying in 1781, his widow married, in 1784, Piozzi, a Florentine music master. She accompanied her husband to his native city. Among her writings are, Observations made in France, Italy, and Germany (1789); British Synomymy, or an Attempt at regulating the Choice of Words in familiar Conversation (1794); Review of the most striking Events and Characters of the last 1800 Years (1801), &c. Mrs Piozzi died at Clifton, May 2, 1821, in her 82d year.

PIP, or PEP (*pepia*); a disease among poultry, consisting of a white, thin skin, or film, that grows under the tip of the tongue, and hinders their feeding.

PIPE, in law; a roll in the exchequer, otherwise called the *great roll;* whence there is an office called the *pipe-office*, where cognizance is taken of forfeitures to the king.

PIPE; a wine measure, usually containing from 110 to 140 gallons. Two pipes, or 252 gallons, make a tun.

PIPE. We have given a view of the general laws of the motions of liquids in the article *Hydrodynamics*, but there are some practical results of these laws, as applied to their motions in pipes, which derive importance from the great use made of pipes in the conveyance of water. (See *Aqueducts*.) The friction that occurs between a solid and the surface upon which it moves can be accurately ascertained but not so with a fluid; for in this, while one part may be moving rapidly, another may be quite stationary, moving slowly, or even moving in a contrary direction. This is particularly observable in rivers, where the central part, or main current, will always be found flowing with much greater rapidity than either side; and experiment proves that the same effect occurs when water flows through pipes; for that water, which is in contact with the side of the pipe, moves with much more resistance than that at the centre, whereby the calculated discharge of any given pipe of considerable length, becomes much less than is due to its magnitude. The term *friction* is applied to this obstruction to the passage of fluids, in the same manner as it is to solids, and it exists to such an extent as to become an object of considerable inconvenience in practice. It can only be obviated by making the conveying pipe of much larger dimensions than would otherwise be necessary, so as to allow the free passage of a sufficient quantity of fluid through the centre of the pipe, while a ring or hollow cylinder of water is considered to be nearly at rest all around it. Other circumstances besides friction likewise tend to diminish the quantity of fluid which would otherwise pass through pipes, such as the existence of sharp or right-angled turns in them, and permitting eddies or currents to be formed, or not providing for the eddies that form naturally, by suiting the shape of the pipe to them. It follows, therefore, that whenever a bend or turn is necessary in a water pipe, it should be made in as gradual a curve or sweep as possible, instead of the form of an acute or even right angle; that the pipe should not only be sufficiently capacious to afford the necessary supply, but should be of an equal bore throughout, and free from all projections or irregularities, against which the water can strike and form eddies or reverberations, since these will impede the progress of the fluid as effectually as the most solid obstacles. The [illegible]ion of water in channels or pipes has been found to increase as the square of the velocity. It has also been found that the form of the end of the pipe which communicates with the fountain-head, or reservoir, greatly affects the quantity of water received by it. If it be gradually enlarged like a trumpet mouth, a larger quantity of water will be received than by any of the modes which follow, because the direction given to the particles by this form is most favourable to their admission. If the entrance to the pipe be abrupt, in consequence of the cavity being wholly cylindrical, the particles will have a tendency to cross each other, and less water will enter the pipe in a given time. And if the end of the pipe projects into the reservoir, a variety of opposing forces will be produced among the particles moving towards the entrance, so that a smaller quantity will be received by the pipe, than in either of the preceding cases. The form of the discharging orifice, likewise, influences the quantity of water delivered by a pipe in a given time. If the end of the pipe be enlarged, by adding to it a frustum of a hollow cone, the amount of water discharged in some cases may be prodigiously increased. This fact, described by Venturi, appears to be the result of the pressure of the atmosphere, aided by the inertia and cohesiveness of the water. The pipes by which water is conveyed beneath the ground are generally of small or moderate size, are intended to be water tight, and have been made from a great variety of materials. It is desirable that they should possess strength, tightness and durability, and that the material of which they are composed should not be capable of contaminating the water.

Wooden pipes are commonly hollow logs, perforated by boring through their axis, and connected by making the end of one log conical, and inserting it into a conical cavity in the next. Wooden pipes are in common use in this country, but are liable to decay, especially at the joints, where their thickness is smallest.

Iron pipes are considered preferable to those of wood, being stronger, and, in most situations, more durable. They are made of cast iron, with a socket, or enlarged cavity at one end, into which the end of the next pipe is received. The joints thus formed are rendered tight, either by filling the interstices with lead, or by driving in a small quantity of hemp, and filling the remainder of the socket with iron cement, made of sulphur, muriate of ammonia, and chippings of iron.

Copper pipes are extremely durable, and are made of sheet copper, with the edge turned up and soldered. They require to be tinned inside, on account of the poisonous character of some of the compounds which are liable to be formed in them.

Lead pipes are much employed for small aqueducts, owing to the facility with which they can be soldered, and bent in any direction. They are commonly cast in short pieces, and afterwards elongated by drawing them through holes, in the same manner as wire. Leaden pipes, in general, are supposed not to contaminate the water contained in them, because the carbonate of lead, which is sometimes formed in them, is insoluble in water. They are not safe, however, for pumps and pipes intended to convey acid liquors.

Stone pipes preserve the water contained by them in a very pure state. They are, however, expensive, on account of the labour of working them, with the exception of soap stone, which, being readily shaped and bored, may be usefully applied for the purpose of conveying water, in those places where it is easily procured.

Earthen pipes, made of common pottery ware, and glazed on the inside, are sometimes used, but are more liable to be broken than most of the other kinds.

PIPE-CLAY. See *Clay.*

PIPE, SMOKING. In Asia, the smoking of pipes is much more general than that of cigars, though the latter are also used, and called in India *cheeroots.* In Russia, Poland, and Germany also, pipes are much more common than cigars; the Spaniards, Portuguese and Americans (both North and South), however, much prefer the cigars. Smoking-pipes are of a great variety of kinds. The simplest, and one of the most esteemed, is the clay-pipe. (See *Clay.*) These are formed in moulds, the hollow in the tube being made by running up a wire; the pipes are then dried and baked in a furnace moderately heated. Another kind is made of one long cane, with a bowl and mouth-piece, which is the usual form of Turkish pipes: the mouth-piece is of amber, or a cheaper composition resembling it. In Germany, there are a great number of sorts of pipes, short, long, flexible, with bowls of wood, meerschaum, porcelain, &c. The fine porcelain bowls are wrought with much elegance, and are articles of very considerable luxury. A German pipe generally consists of four chief parts; the mouth-piece, the tube, the bowl, and a part which connects the two latter, and serves to collect the juice descending from the tobacco, and prevent it from getting into the tube. The Eastern *hookah,* or *houkar,* is a very curious instrument, the essential feature of which is, that the smoke passes through water, loses the particles which give it an unpleasant flavour, and becomes cool before it reaches the mouth. The mode of effecting this is as follows: From the bowl, which is on an air-tight vessel, half filled with water, a small tube descends into the water; in the side of the vessel the smoking-tube is inserted, so that it communicates only with the air in the vessel. If the smoker now withdraws the air in the vessel, the atmosphere, pressing from without on the bowl, forces the smoke of the burning tobacco through the small tube into the water, from which it immediately bubbles up and enters the smoking tube, which is generally very long and pliable.

PIPERINE; the active principles of pepper, a new vegetable principle extracted from black pepper by means of repeated digestions in alcohol. The solution is at length evaporated to dryness, when an oily, resinous matter is obtained. This, on being washed in warm water, becomes of a good green colour. It has a hot and burning taste, dissolves readily in alcohol, less so in ether. Concentrated sulphuric acid gives it a fine scarlet colour. The alcohol solution, after some days, deposits crystals, which are purified by repeated crystallizations in alcohol and ether, when they form colourless four-sided prisms, with single, inclined terminations. They have scarcely any taste. Boiling water dissolves a small portion of it, but it is insoluble in cold. They are soluble in acetic acid, from which solution feather-like crystals may be obtained. The fatty matter left, after extracting the piperine, is solid at a temperature of 32°, but liquefies at a slight heat. It has an extremely bitter and acrid taste, is very slightly volatile, and may be considered as being composed of two oils, one volatile and balsamic, the other more fixed, and containing the acrimony of pepper.

PIPOWDERS COURT. See *Courts.*

PIQUET; a celebrated game at cards, played between two persons, with only thirty-two cards, all the deuces, threes, fours, fives and sixes being set aside. In reckoning at this game, every card goes for the number which it bears, as a ten for a ten, and the ace for eleven, only all court-cards go for ten, and the usual game is one hundred up. In playing, the ace wins the king, the king the queen, and so on. Twelve cards are dealt round, usually by two and two; which done, those that remain are laid in the middle. For the rules of the game, see *Hoyle.*

PIRACY is the crime of robbery and depredation committed upon the high seas. It is an offence against the universal law of society, a pirate being, according to Sir Edward Coke, *hostis humani generis.* As, therefore, he has renounced all the benefits of society and government, and has reduced himself to the savage state of nature, by declaring war against all mankind, all mankind must declare war against him; so that every community has a right, by the rule of self-defence, to inflict that punishment upon him which every individual would, in a state of nature otherwise have been entitled to do, for any invasion of his person, or personal property. By various statutes in England and the United States of America, other offences are made piracy. Thus, if a subject of either of these nations commits any act of hostility against a fellow-subject on the high seas, under colour of a commission from any foreign power, this is an act of piracy. So if any captain of any vessel, or mariner, run away with the vessel, or the goods, or yield them up to a pirate voluntarily, or if any seaman lay violent hands on his commander, to hinder him from fighting in defence of the ship or goods committed to his charge, or make a revolt in the ship, these offences are acts of piracy, by the laws of England. By the statute of 8 George I. c. 24, the trading or corresponding with known pirates, or the forcibly boarding any merchant vessel (though without seizing her or carrying her off), and destroying any of the goods on board, are declared to be acts of piracy; and by the statute 18 George II. c. 30, any natural born subject, or denizen, who, in time of war, shall commit any hostilities, at sea, against any of his fellow-subjects, or shall assist an enemy, on that element, is liable to be punished as a pirate. By statute of George II. c. 25, the ransoming of any neutral vessel, which has been taken as a prize, by the commander of a private ship of war, is declared to be piracy. By the act of parliament passed March 31, 1824, the slave-trade is also declared to be piracy. In the time of Richard III. by the laws of Oleron, all infidels were regarded as pirates, and their property liable to seizure wherever found. By the law of nations, the taking of goods by piracy does not divest the actual owner of the property. By the civil institutions of Spain and Venice, ships taken from pirates become the property of those who retake them. Piracy is every where pursued and punished with death, and pirates can gain no rights by conquest. It is of no importance, for the purpose of giving jurisdiction in cases of piracy, on whom or where a piratical offence is committed. A pirate, who is one by the law of nations, may be tried and punished in any country where he may be found; for he is reputed to be out of the protection of all laws. But if the statute of any government declares an offence, committed on board one of their own vessels, to be piracy, such an offence will be punished exclusively by the nation which passes the statute. In England, the offence was formerly cognizable only by the admiralty courts, which proceeded without a jury, in a method founded upon the civil law. But, by the statute of Henry VIII. c. 15, it was enacted that piracy should be tried by commissioners nominated by the lord chancellor, the indictment being first found by a grand jury of twelve men, and afterwards tried by another jury, as at common law. Among the commissioners, there are always some of the common law judges.

Piracy, in the common sense of the word, is distinguished from privateering, by the circumstance that the pirate sails without any commission, and under no national flag, and attacks the subjects of all nations alike; the privateer acts under a commission from a belligerent power, according to certain maritime laws. The only instances in which privateering has been recognised by any nation as unlawful, is contained in the treaty of the United States of America with Prussia, in 1785. The Barbary powers, notwithstanding some doubts which formerly existed, have been regarded, for a century past, as lawful powers, and not as pirates. They have all the insignia of regular nations, and are competent to maintain the European relations of peace and war.

PIRACY, LITERARY. See *Copyright* and *Literary Property*.

PIRÆUS. See *Athens*.

PIRANESI, a celebrated architect, engineer, and antiquary, was born at Venice, probably about 1711, although one account says in 1721. He passed the greater part of his life at Rome. His earliest work, published in 1743, consists of designs of his own, in a grand style, and is adorned with views of Rome. His other works are, *Antichità Romane*, or Roman Antiquities, in 220 plates, with descriptions in Italian (4 vols., folio); *Fasti Consulares Triumphalesque Romanorum; Del Castello dell' Acqua Giulia* (21 folio plates); *Antichità d'Albano e di Castel Gandolfo* (55 plates); *Campus Martius Antiquæ Urbis* (54 plates); *Archi Trionfali Antichi Tempj ed Amfiteatri* (31 plates); *Trofei d'Ottaviano Augusto* (10 plates); *Della Magnificenza ed Architettura de' Romani* (44 plates); *Architetture Diverse* (27 plates); *Carceri d'Invenzione* (16 plates;) and about 130 views of Rome in its present state. His inventions display much grandeur and fertility; but his representations of real objects are not always faithful, on account of the scope which he gave to his imagination. He died in 1778. Two sons, Francis and Peter, settled at Paris, continued his works, now amounting to 23 vols. folio.

PIRITHOUS; in fabulous history, son of Jupiter and Dia, wife of Ixion, king of the Lapithæ, and friend of Theseus. He married Dejanira of Hippodamia, daughter of Adrastis, a prince of the Lapithæ, by whom he had Polypœtes. His marriage is famous for the battle of the Lapithæ and Centaurs, occasioned by the attempt of a drunken Centaur (Eurythion) to do violence to the bride, and which resulted in the expulsion of the Centaurs from Pelion. After the death of his wife, Pirithous went to Athens, and, with Theseus, who had also lost his wife, carried off Helen from Sparta. Having reached Athens, they cast lots for her, on condition that he who was successful should aid the other in procuring a wife. She fell to Theseus, whom Pirithous required to aid him in the rape of Proserpine, wife of Pluto. The two friends, therefore, descended into the infernal regions, but having sat down to rest, they were unable to rise again. Theseus was afterwards set free by Hercules, but Pirithous remained in the infernal world, loaded with 300 chains, or, according to some, was torn in pieces by Cerberus.

PIRON, ALEXIS, a celebrated French wit, poet, and dramatist, born at Dijon, in 1689, was the son of an apothecary. He took his degrees in the faculty of law at Besançon, and was about to be admitted to practice, when his parents experienced a reverse of fortune, which obliged him to relinquish his design. He remained some time at Dijon, leading a life of dissipation, in the midst of which his literary efforts were confined to the production of a few satirical epigrams. At length he became clerk to a financier, whom he quitted to go to Paris, where he was employed as a copyist, with a salary of forty sous a day. This irksome situation he soon relinquished; and it was with difficulty that he obtained the payment of his pitiful salary. He was next engaged to write for the Theatre of the Comic Opera, and his first piece was *Arléquin Deucalion*, composed in two days. His success induced him to persevere, and after writing several pieces, he produced in 1738 his *chef-d'œuvre, Métromanie*, a comedy, which Laharpe characterizes as excelling in plot, style, humour, and vivacity almost every other composition of the kind. Piron afterwards wrote *Fernand Cortes*, a tragic drama, and some other pieces, acted at the *théâtre de la Foire*. In the latter part of his life he made repeated attempts to gain admission into the French academy; but the satirical effusions in which he had indulged himself had made him so many enemies among the academicians, that he was finally rejected. He revenged himself for his disappointment by calling the academy *Les invalides du bél esprit*, and composing the humorous epitaph,

Cigit Piron, qui ne fut rien,
Pas meme academicien:[*]

The king, however, at the solicitation of Montesquieu, gave Piron a pension of 1000 livres. His death took place Jan. 21, 1773. His *bon mots* were collected and published in one volume 18mo; and his *Poésies Diverses* were printed at Neufchatel, 1775, and 1793, 8vo. His works entire form seven volumes octavo, in the edition of Rigoley de Juvigny, 1776.

PIROUETTE, in dancing; a rapid circumvolution upon one foot, which, on the stage, is repeated by the dancers many times in succession. In riding it is the sudden, short turn of a horse, so as to bring his head where his tail was.

PISA, one of the most ancient and beautiful cities of Italy, in the grand-duchy of Tuscany, stands in a fertile plain, about eight miles from the entrance of the Arno into the sea. The air is tolerable healthy and mild. Instead of the 150,000 inhabitants, which it formerly contained, the city now numbers scarcely 17,000. Silence and solitude reign here, as in the other great cities of Italy, which have finished their part in history. The Arno divides the city into two nearly equal parts, connected by three bridges. The two great quays (*lungarno*) are adorned with edifices in the noblest style, whose fortified appearance recalls the warlike days of the republic. The streets are mostly wide, straight, and well paved; but the grass growing between the stones, is a melancholy mark of depopulation. Among the eighty ecclesiastical buildings, the cathedral, built in the eleventh century by a Greek architect, strikes one with awe, and contains many remarkable monuments. Behind the cathedral stands the celebrated leaning tower, built in the twelfth century, by a German of the name of William; its inclination amounts to about fifteen feet from the perpendicular. It is a round tower of marble, consisting of eight rows of pillars, one above another, and is 168 feet in height. It has been doubted, whether this beautiful tower has actually sunk, or whether it was designedly built with its present inclination. Opposite the cathedral stands the *battisterio*, or baptistery, which is of the same age, round, and adorned with pillars. It was built by Dioti Salvi. Between the two is the Campo Santo, one of the greatest wonders of art in Italy. It is an old church-yard the earth of which the Pisans brought from Jerusalem, surrounded by Gothic halls, the walls of which are painted in fresco by the most celebrated early artists, among whom are Memmi, Orcagna, &c. But all are eclipsed by the inimitable paintings of Benozzo Gozzoli. Carlo Lasanio, superintendent of the Campo Santo, has published fine engravings of these pictures, *Pi-*

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[*] Here lies Piron, who was nothing—
Not even an Academician.

ture la Fresco del Campo (1812). There is also here a large collection of Etruscan and Roman antiquities, particularly urns and *sarcophagi*. Among the other churches, we must mention the church Madonna della Spina, distinguished for its delicate architecture, and the church S. Stefano, built in a more modern style, which, with the neighbouring palace, belonged to the military order of St Stephen, that once resided here. Several palaces, and the Loggia de' Mercanti, are worthy of note. An edifice is still shown as the tower of famine, in which Ugolino della Gherardesca perished (1283), with his children. The original tower, however, no longer exists. The family of Gherardesca was still extant at Pisa in 1798. The university is old, and has always possessed celebrated professors. The observatory and the botanical garden are in the best condition. There are in the city an *accademia Italiana*, a physico-medical college, cabinets of art, and, in the vicinity, an agricultural establishment, S. Rossore, with a collection of breeding-horses, a colony of 200 camels, and a herd of 1800 wild cows. The refinement and kindness of the inhabitants make a residence in Pisa delightful to a stranger. At a little distance from the city, at the foot of Monte S. Giuliano, and named after this mountain, are the Pisan baths. Twelve warm sulphur springs are enclosed in large, convenient buildings, in which provision is made for all the wants of the visitors. The baths are not, however, in so high repute as they were in the middle of the last century. The splendid Carthusian monastery near Pisa is also worth seeing. The trade and manufactures of the place are of little importance. Large quantities of oil, which is but little inferior in quality to the oil of Lucca, is made here; the fields and hills are well cultivated, and the marble quarries in the neighbourhood are among the finest in Italy.

Pisa was a flourishing republic in the middle ages, and owed its prosperity to the great love of liberty, and the active, commercial spirit, which distinguished its citizens. From the Saracens the republic conquered Sardinia, Corsica, the Baleares, and was styled the queen of the seas. Its territory on the Tyrrhene shore comprehended the Maremma from Lerici to Piombino, which was at that time cultivated and very fruitful. By sea the rival of Venice and Genoa, she founded colonies in the Levant, and sent forty vessels to aid the king of Jerusalem. Faithful as a zealous Gibeline to the emperor, involved in a bloody struggle with the Guelfic Florence, with Lucca and Sienna, which adhered to the pope, an object of jealousy to all her neighbours, overcome by Genoa in a bloody naval battle, and torn by the internal dissensions of powerful families, she finally sunk under the jealousy and hatred of Florence. Ugolino, however, reigned but a short time over the city, which had been stripped of her fortresses. The courage with which 11,000 Pisans preferred to suffer sixteen years of severe imprisonment, rather than surrender a fortified place to the enemy, sustained for a time the spirit of the republic, which, with its own arms, defeated the army of the Guelfs of all Italy. But, being exhausted, it finally put itself under the protection of Milan, and was soon after sold to duke Galeazzo Visconti, from whose successors Florence obtained it by purchase, in 1406. The city was compelled to surrender by famine; and those disposed to resist were kept in obedience by force. The larger part of the citizens emigrated. But, after eighty-eight years of oppression, when Charles VIII. of France made an expediton into Italy, the ancient pride of Pisa was aroused, and, for fifteen years, she fought gloriously for her liberty. Simon Orlandi called his fellow citizens to arms, and the people, under the protection of Charles VIII., who took possession of Pisa by a treaty with Florence, adopted a constitution of their own. Then began an obstinate war between Florence and Pisa. The inhabitants of the latter city, with the assistance of the French garrison, reconquered the ancient territory, and defeated the Florentine mercenaries. Their courage foiled every effort of their former sovereigns. When the French garrison departed, they took the oath of allegiance to the French king as their protector. Pisa now became a place of importance. Princes and republics negotiated, some for, some against the continuance of the revived republic. Abandoned at last by all, the Pisans swore to perish rather than submit to their hereditary enemy. Florence had already made itself master of the Pisan territory, and, on the last of July, 1499, the siege of the city was commenced with such ardour, that, in a fortnight, the Florentines hoped to have it in their power. But the females of Pisa worked day and night to repair the walls; and the enemy having taken a castle by storm, they exhorted their disheartened citizens to die rather than become the slaves of the Florentines. By this spirit the city was saved, and the enemy after great loss, raised the siege, September 4. The Pisans now changed their city into a formidable fortress. Even an army sent by Louis XII., king of France (who wished to subjugate Pisa for the Florentines), besieged it in vain. In 1504, the Florentines resumed the siege of Pisa. They attempted to dam up the Arno above the city, but had to relinquish the plan after great expense. A third siege, in 1505, was equally unavailing. The city was finally (June 8, 1509) reduced by famine, and submitted to the Florentines, with an amnesty for the past. Thus Pisa, having frustrated four attacks, and asserted its freedom for fifteen years, fell into the power of the Florentines, and ceased for ever to be independent. On its ruins was founded the power of Tuscany.

PISIDIA. See *Natolia*.

PISISTRATUS, an Athenian citizen who usurped the sovereignty of his country, was of noble descent, which he himself derived from Codrus, the last king of Athens, and inherited from his father, Hippocrates, a large fortune. He received from nature those qualifications which give influence to an individual, facility of speech, and uncommon vigour of understanding. To these he had added all the learning of his time. On entering public life, he lent his eloquence to the plans of Solon, his maternal relation, for exciting the Athenians to recover Salamis, and accompanied the lawgiver in the successful enterprise against that island. By nature ambitious, he pursued the policy which has so often succeeded in democracies: he gained over the lower classes of the citizens by his affability and unbounded liberality. He relieved their burdens, laid open his gardens for their use, provided for the sick, and caused the dead to be buried. In all his harangues, he was the advocate of civil equality and a democratic constitution. Solon saw through his policy, and expressed his apprehensions of the result. They were but too soon verified. One day Pisistratus appeared in the market-place, with several slight wounds, which he had inflicted on himself, and called upon his fellow-citizens to protect him against certain alleged enemies, who had, as he said, attacked his life on account of his adherence to the democracy. An assembly of the people was immediately summoned, in which one of his friends proposed that a guard should be given him for the security of his person. This proposal was approved, notwithstanding the opposition of Solon. A body-guard, by the aid of which he possessed himself of the citadel of Athens, was given him. He disarmed the multitude, and was now master of the city, while Solon departed from his enslaved country (560 B. C.) But, though Pisistratus, by the manner in which he obtain his power, drew upon himself the reproach of tyranny, his use of power was by no means tyrannical; for no lawful prince ever showed more moderation or more regard for the welfare of the people. He made no attempt to abolish the wise laws of Solon, but confirmed and extended their authority. He always showed the greatest respect for the lawgiver, but his endeavours to induce him to return to Athens were ineffectual. The sovereignty of Pisistratus was not, however, secure. Megacles, who was the head of a hostile party, left Athens with his family, and entered into a correspondence with a third party, for the purpose of overthrowing the power of Pisistratus. Their project succeeded, and Pisistratus was compelled to leave the city. But Megacles soon became dissatisfied with the party to which he had united himself, and offered to reinstate Pisistratus if he would marry his daughter. This proposition he immediately accepted. His return was effected by a stratagem which gives a striking proof of the credulity of the people. A female of a majestic stature was arrayed in the armour of Minerva, and it was proclaimed that the goddess herself had brought back Pisistratus. He entered the city with her in a solemn procession, seated in a magnificent car, and was again established without opposition. This fact is related by Herodotus, who calls it ridiculous. Pisistratus married, as he had promised, the daughter of Megacles, but did not live with her as his wife, as he had already a family. To revenge this insult, Megacles again formed a hostile party, which appeared so formidable to Pisistratus that he retired voluntarily to Eretria. Here he occupied himself with the education of his sons, and took measures to recover his power. In the eleventh year of his second banishment, he entered Attica at the head of an army. Many Athenians who were dissatisfied with the democracy, and remembered his early benefits, joined him. After having surprised and dispersed the troops sent against him, he entered the city, and made himself master, for the third time, of the sovereignty, without bloodshed. Pisistratus continued to rule with his former mildness; but, in order to weaken the popular party, he adopted a measure which was very useful to the state. He forced many of the idle inhabitants to leave the city and cultivate the country around, which by these means was covered with cornfields and olive plantations. He exacted from every one the tenth part of his income and earnings, and thus increased the revenue of the state, which he expended in splendid public buildings. He also endeavoured to advance the intellectual cultivation of the Athenians. He established a public library, and collected and arranged the poems of Homer. As he well knew how tyranny was hated, he carefully concealed his power under the exterior of a private citizen. He submitted, like others, to the sentence of the Areopagus, before which he was accused of murder, and conducted himself with as much prudence as clemency. In this way Pisistratus exercised the sovereignty, not as the oppressor but the father of his country, which scarcely ever enjoyed a longer term of peace and prosperity. He died 527 B. C., leaving two sons, Hippias and Hipparchus, to inherit his power, who were not, however, able to preserve it.

PISO; a surname common to many Romans of the Calpurnian family. Lucius Calpurnius Piso, when consul, subdued the seditious slaves in Sicily, and proposed the law *de repetundis*, concerning restitution in cases of extortion, in order to put limits to the avarice of the magistrates in the administration of the provinces. He distinguished himself, as prætor, in Sicily (where the purchase of provisions had been committed to him during a scarcity of corn at Rome) by a rare disinterestedness, so that he received the honourable appellation of *Frugi* (the honest). Another Piso afterwards filled the office of consul with Gabinius, in Cicero's time, and showed himself particularly hostile to that great man, who, in a speech which still remains to us, spoke very violently against him. Still later lived the Piso who, under Tiberius, was prefect of Syria, and distinguished himself for his pride, as well as for his odious conduct towards the noble Germanicus, the adopted son of Tiberius, whom he is said to have taken off by poison.

PISTACHIA TREE; a small tree, with heavy, crooked limbs, somewhat resembling the walnut in foliage, indigenous to Syria and the neighbouring parts of Asia, and now cultivated in many parts of the south of Europe. The fruit, which forms a considerable article of commerce, is a thin-shelled, oval and acuminate nut, about as large as an olive, and has a very agreeable flavour. These nuts are disposed in racemes, and are usually produced in profusion. Michaux recommends the introduction of this tree into West Tennessee and the Southern States. It flourishes in the same soil and climate as the olive—in dry, calcareous or stony grounds, and shuns a sandy and humid soil. As the plant is diœcious, care should be taken, in forming plantations, to allot one barren to five or six fertile plants; and, to avoid mistake, young grafts, stocks, or suckers, from the root of an old tree, may be employed. The flowers of both sexes are small, greenish, and inconspicuous. From a second species of pistachia is obtained the mastic of commerce. See *Mastic*.

PISTOIA (anciently *Pistoria*); a provincial town of Tuscany, six and a half leagues north-west of Florence, a bishop's see, on a branch of the Arno; lat. 43° 56′ 5″ N.; lon. 10° 55′ 12″ E.; with 9150 inhabitants. In the neighbouring mountains copper is found, also rock-crystal, called *diamond of Pistoia*; and inflammable gas issues from the earth. Pistoia was a republic in the middle ages, and lost its liberty with Pisa, in the beginning of the fifteenth century. It is a place often mentioned in the history of Florence. It is said that the first pistols were made here. Many straw hats are manufactured in this place.

PISTOL; a small hand gun, of a structure too well known to require particular description. Pistols are of various sizes, some being so small that they may be deposited in the waistcoat pocket. These are called *pocket pistols*. Others, such as duelling and horse pistols, are sometimes nearly half as long as a carbine. Pistol barrels are oftentimes rifled, and have frequently the addition of a sight. The best pistols are manufactured at London; those of an inferior kind at Sheffield and Birmingham. The stocks of the pistols intended for the Turkey trade are usually inlaid with silver, gold, mother of pearl, &c., and are, on the whole, far more costly than those sent to any other part of the world. Pistols, if well mounted, bring high prices at Constantinople and Smyrna. For the origin of the name, see *Pistoia*.

PISTOLE; the name of a coin and imaginary money, in use in several parts of Europe, more especially in Spain, Italy, and Switzerland. See *Coins*.

PITCAIRN'S ISLAND; in the south Pacific ocean, lat. 25° 4″ S., lon. 133° W., six miles long and three broad, covered with wood, of a fertile soil, and fine climate, but having neither river nor harbour. It was discovered by Carteret in 1767, when it was uninhabited, but was settled in 1789, by some of the mutineers of the British ship Bounty. The Bounty, under the command of lieutenant Bligh, had been sent out to introduce the bread-fruit tree from Otaheite into the West Indies, but was taken possession of by the crew, who set their officers adrift in a boat. Bligh and his companions arrived safely at the island of Timor, after a voyage of 1200 leagues.

The next year the admiralty sent captain Edwards, in the Pandora, to Otaheite, in search of the twenty-five mutineers, who were supposed to have returned thither. At his arrival in the island (1791), four of them came on board, and ten others, who were living there, were taken the next day; they were carried home, with the exception of some who were lost by the wreck of the Pandora, and most of them were executed. According to their accounts, the mutineers, under Christian Fletcher, sailed for Toobooai, one of the Society islands, with the intention of settling there, and afterwards returned to Otaheite, where they took on board a supply of fruit trees and twenty-four Otaheitans, with whom they went back to Toobooai. Here they built a fort; but disputes among themselves and with the natives compelled them to abandon their project of forming a settlement, and Christian, finding his authority gone, proposed to return to Otaheite. Those who wished to remain were landed, and Christian, with the eight remaining mutineers and fifteen Otaheitans, of whom eleven were women, left the island. Nothing was known of their fate until 1808, when captain Folger, of Boston, having touched at Pitcairn's island, was surprised to find it inhabited. After landing, he received an account of the colony from an old English sailor, who called himself John Adams, but who is supposed to have been Alexander Smith, the only surviving individual of the crew of the Bounty. Christian had destroyed the ship soon after their arrival. A few years afterwards, the English were all killed by the Otaheitans, except three, who concealed themselves; the Otaheitans quarrelled among themselves, and were all killed or died of their wounds. Two of the Englishmen died soon after, and Adams, or Smith, with several women and children, remained the only inhabitants of the island. Captain Folger gave a circumstantial account of his discovery in 1813. In 1814, the island was visited by the British frigates Briton and Tagus, and has been repeatedly visited since. By the visitors in 1814, the inhabitants were thus described:—"This interesting new colony now consisted of about forty-six persons, mostly grown up young people, besides a number of infants. The young men, all born in the island, were very athletic, and of the finest forms, their countenances open and pleasing, indicating much benevolence and goodness of heart; and the young women were objects of particular admiration; tall, robust, and beautifully formed, their faces beaming with smiles and unruffled good humour, but wearing a degree of modesty and bashfulness that would do honour to the most virtuous nation on earth; and all of them, both male and female, had the most marked English features. Their native modesty, assisted by a proper sense of religion and morality, instilled into their youthful minds by John Adams, the leader of the colony, has hitherto preserved these interesting people perfectly chaste. The greatest harmony prevails among them. But what was most gratifying to the visitors, was the simple and unaffected manner in which they returned thanks to the Almighty for the many blessings they enjoyed. Their habitations are extremely neat; and the village of Pitcairn forms a pretty square." John Adams died in 1830. Recent accounts state that the island was abandoned not long after, on account of the scarcity of water, and that the whole colony of about sixty individuals had arrived at Otaheite.

PITCH. See *Pine*.

PITCH; the acuteness or gravity of any particular sound, or of the tuning of any instrument. Any sound less acute than some other sound, is said to be of a lower *pitch* than that other sound, and *vice versa*. The *opera pitch* is tuned above most others, and is therefore said to be higher than the common *concert pitch*. See *Acoustics*.

PITCHER PLANT. See *Nepenthes*.

PITCH-PIPE; an instrument used by vocal practitioners to ascertain the *pitch* of the key in which they are about to sing. It is blown at one end like a common flute, and being shortened or lengthened by a graduated scale, is capable of producing, with mechanical exactness, all the semitonic degrees within its compass.

PITCH ORE. See *Uranium*.

PITCHSTONE, PEARLSTONE, PUMICE, and OBSIDIAN. All these substances, formerly regarded as distinct, are now included under one species in mineralogy, the character of which is the following: cleavage none; fracture conchoidal, sometimes highly perfect, sometimes less distinct; in the granular masses, the fracture is more or less uneven and splintery; lustre vitreous and resinous; colours black, brown, red, yellow, green, gray and white; hardness between that of feldspar and quartz; specific gravity 2.3. The variety called *obsidian* possesses the most perfect conchoidal fracture and the highest degree of lustre. Agreeably to the degree of transparency, it is divided into *transparent* and *translucent* obsidian; the former of which is sometimes called *marekanite*. If the high perfection of the conchoidal fracture disappears, the mineral takes the name of *pitchstone*. Pitchstone often contains those faces which are called the faces of distinct concretion; if these are numerous, variously curved, and contain but little matter between them, *pearlstone* is formed. The obsidian is often vesicular, the cavities being small, and keeping a constant direction; if there are a great many of them of larger sizes, the whole mass becomes apparently very light, the original colour disappears, and gives place to a pearly or silky lustre; and thus arises the variety called *pumice*. The analysis of these varieties presents the following results:

	Obsidian.	Pitchstone.	Pearlstone.	Pumice.
Silex	72.00	73.00	75.25	77.50
Alumine	12.50	14.50	12.00	17.50
Potash	10.	0.00	4.50	3.00
Soda		1.75	0.00	
Oxides of iron and manganese	2.00	1.10	1.60	1.75
Lime	0.00	1.00	0.50	0.00
Water	0.00	8.50	4.50	0.00

Before the blow-pipe, they all melt with more or less facility into a vesicular glass, or they yield an enamel, according to the fusibility of their ingredients. The geological relations of these species are very remarkable. Pitchstone forms mountain masses, and is generally in close connexion with porphyry. Many of the other varieties occur under similar circumstances. Pitchstone veins sometimes occur in sandstone. Pumice and obsidian are among the products of volcanoes. The southern countries of Europe, South America, Mexico and the Sandwich islands are rich in the varieties of pitchstone. Pearlstone, in particular, occurs in Hungary, and at Cabo de Gates, in Spain. Obsidian is very frequent in Iceland and Mexico; pumice in the Lipari islands, Teneriffe and Peru. Obsidian is employed for mirrors, vases, snuff-boxes, &c. In Mexico and the island of Ascension, very sharp fragments are used as tools and weapons. Pumice yields a well known material for grinding and polishing, and is also employed for a filtering stone.

PITH. See *Medulla*.

PITT, Christopher, an English poet, born in 1699, at Blandford, received his education at Winchester, whence he was elected, upon the foundation, to New college, Oxford. In 1722, a relation presented him to the family living of Pimperne, where he passed his life in the performance of his clerical duties, and the pursuit of elegant literature. He is principally known by his translation of the Æneid and of Vida's Art of Poetry. Mr Pitt died in 1748. (See Johnson's *Lives of the Poets*.)

PITT, earl of Chatham. See *Chatham*.

PITT, WILLIAM, second son of the earl of Chatham, was born May 28, 1759. He received a private education in the first instance, and, at the age of fourteen, was entered of Pembroke hall, Cambridge. On quitting the university, he visited France, and studied at Rheims, and, on his return, became a student of Lincoln's inn; and, in 1780, was called to the bar. He attended the western circuit once or twice, when he was introduced into parliament by Sir James Lowther, as representative for his borough of Appleby. His maiden speech was delivered in support of Mr Burke's financial reform bill, and he also spoke in favour of a reform in parliament. On the breaking up of the Rockingham administration, he became chancellor of the exchequer, at the age of twenty-three, under the premiership of the earl of Shelburne. A general peace soon followed, which being made the ground of censure by a strong opposition, the cabinet was dissolved, and the Fox and North coalition took its place. On his retirement from office, Mr Pitt resumed his efforts for a reform in parliament, and submitted three specific motions on the subject, which, although supported by Mr Fox, then secretary of state, were rejected. On the failure of the India bill of the latter, which produced the dismissal of the coalition, Mr Pitt, although at that time only in his twenty-fourth year, assumed the station of prime minister, by accepting the united posts of first lord of the treasury and chancellor of the exchequer. Although strongly supported by the sovereign, he stood opposed to a large majority of the house of commons, and a dissolution took place in March, 1786. At the general election which followed, the voice of the nation appeared decidedly in his favour, and some of the strongest aristocratical interests in the country were defeated; Mr Pitt, himself being returned by the university of Cambridge. His first measure was the passing of his India bill, establishing the board of control, which was followed by much of that fiscal and financial regulation, which gave so much *éclat* to the early period of his administration. The establishment of the delusive scheme of a sinking fund followed in 1786. Whatever may be the utility of the sinking fund in the regulation of funded sale and purchase, as a miraculous mode of liquidating the public debt, its pretensions are now set at rest for ever. A commercial treaty with France followed in 1787, and soon after, the minister began to exhibit that jealousy of Russian aggrandisement, which, but for the manifest unpopularity of hostilities, might have involved the two countries in war. A similar spirit was displayed towards Spain, respecting the free trade at Nootka sound; and in defence of the stadtholder against the machinations of France. In 1788, Mr Pitt resisted the doctrine of the opposition, that the regency, during the king's indisposition, devolved upon the prince of Wales by right. The minister maintained, that it lay in the two remaining branches of the legislature to fill up the office, but that the prince could not be passed over in nominating to this post. By the adoption of this principle he was enabled to pass a bill restricting the regent's power, which the king's recovery rendered unnecessary.

One of the most momentous periods in modern history had now arrived. The French revolution broke out, and produced a vibration in every neighbouring state; and a sensation was created in Great Britain, which, previously excited as she had been on subjects of parliamentary and general reform, in a great measure broke up the previous party divisions. A war against French principles was declared on the one side, by which all amelioration was opposed; while, on the other, the friends of rational reformation found themselves confounded with ignorant and heated men, who espoused some of the wildest and most visionary notions of the innovators of France. To make alarm as effective as possible; to encourage the dissemination of high principles of government, and involve in common obloquy all measures of opposition, and all projects of reform; to augment, according to the apparent urgency of circumstances, restrictions upon personal liberty, and make temporary sacrifices of the spirit of the constitution to what he deemed the public safety,—such, according to one party, were the principles of Mr Pitt's government at this crisis; while others would have had him gone much farther, and, purely on a conservative principle, would, in a constitutional sense, have left him nothing to preserve. The details of the momentous contest which followed, form no subject for the biographer. Great Britain was successful by sea; but, during the life of Mr Pitt, the conflict on the continent was in favour of France. The suspension of cash payments in 1797, the necessity of attending to home defence, the mutiny in the fleet, and the accumulation of the public burdens, which still press so heavily on the nation, were some of the bitter fruits of this struggle; which were, however, on the other hand, alleviated by a commercial monopoly, that, assisted by the temporary operation of an unlimited paper issue, materially modified the consequences both in form and in fact. In 1800, the Irish union was accomplished.

Soon after the accomplishment of this event, the hopeless aspect of the war with France began to turn the national attention towards peace; and Mr Pitt determined to retire. The alleged reason for his retreat, not publicly avowed, but communicated to his friends, was the opposition of the king (see *George III.*) to all further concession to the Irish Catholics, which had been promised by the articles of the union. (See *Catholic Emancipation.*) He accordingly resigned his post in 1801; and the crisis of revolutionary fervour having for some time abated, he carried with him into retirement the esteem of a powerful party, which hailed him as "the pilot that weathered the storm." The peace of Amiens succeeded; and the Addington administration, which concluded it, Mr Pitt supported for a time, and then joined the opposition, and spoke on the same side as his old antagonist Mr Fox. The new minister, who had renewed the war, unable to maintain his ground, resigned; and, in 1804, Mr Pitt once more resumed his post at the treasury. Returning to power as a war minister, he exerted all the energy of his character to render the contest successful, and found means to engage the two great military powers of Russia and Austria in a new coalition which was dissolved by the battle of Austerlitz. Mr Pitt, whose state of health was previously declining, was sensibly affected by this event; and his constitution, weakened by a hereditary gout, and injured by a too liberal use of wine, by way of stimulant, rapidly yielded to the joint attack of disease and anxiety. The parliamentary attack upon his old associate, lord Melville (see *Dundas*), not wholly parried either by ministerial influence or the merits of the case, is thought to have deeply wounded his feelings, and completed his mental depression. A state of extreme debility ensued, which terminated in death, encountered with great calmness and resignation, January 23, 1806.

As a minister, it would be impossible to sum up the character of Mr Pitt in terms that would not encounter a host of predilections and prejudices on every side. It is, however, generally conceded, that his genius was better adapted to the regulative process of peaceable and domestic government, than to the arrangement and conduct of that warlike exertion, which his policy entailed upon the country. At the same time, it must be confessed, that he had to encounter overwhelming energies—the result of a social crisis of most extraordinary character. If, therefore, he can be acquitted of a want of foresight in volunteering such a conflict, the result of the warfare, in establishing French ascendancy on the continent, may be regarded as the effect of causes which no abilities could have controlled. According to the theories with which he set out in life, and as the son of lord Chatham, much constitutional and political improvement was to be expected from him; and much prudent and useful regulation he certainly effected. In higher points, he was, perhaps, more the man of expediency than of principle. It has been seen how he advocated and dropped the subject of parliamentary reform. In a similar spirit, he spoke and voted in favour of the abolition of the slave-trade; but although supported by the voice of a decided national majority, he would not make a ministerial measure of it, as was done without difficulty by his immediate successor; nor can we trace any decided social amelioration to his influence. As a financier, he was expert in practice rather than scientifically grounded; while the waste and profusion of his warlike expenditure were extreme, and will long be felt in their consequences. Although love of power was certainly his ruling passion, he was altogether above the meanness of avarice, and his personal disinterestedness was extreme. So far from making use of his opportunities to acquire wealth, he died involved in debt, which negligence and the demands of his public station, rather than extravagance, had led him to contract; his tastes being simple, and averse from splendour and parade. Mr Pitt possessed no advantages of person and physiognomy; a loftiness approaching to arrogance was the habitual expression of the latter in public, although in private circles he has been described as complacent and urbane. His eloquence, if not more elevated or profound, was, upon the whole, more correct than that of any other orator of his time, and remarkably copious and well arranged. Although neither illuminated by the flashes of genius which characterized his father's oratory, nor by the imagination which distinguished the eloquence of Burke, it was more uniformly just and impressive than that of either; while the indignant severity and keenness of his sarcasm were unequalled. On the whole, Mr Pitt was a minister of commanding powers, and still loftier pretensions; and he died in possession of the esteem of a large portion of his countrymen. A public funeral was decreed to his honour by parliament, and a grant of £40,000 to pay his debts. The reader may consult Gifford's *Life of Pitt* (3 vols. 4to., London, 1809) or the later work of his tutor, doctor Tomline (Prettyman), bishop of Winchester (London, 1821), a review of which, in the 35th volume of the Edinburgh Review, gives the Whig opinions of Mr Pitt. For the Tory views of Mr Pitt's conduct, the reader is referred to a series of papers in Blackwood's Mag. for 1836.

PITTSBURGH; a city and capital of Allegheny county, Pennsylvania, 230 miles west-north-west of Baltimore, 297 west-by-north from Philadelphia, and 225 from Washington; lat. 40° 32′ N.; lon. 80° 8′ W.; population, in 1800, 1565; in 1810, 4768; in 1820, 7248; in 1830, 12,542. Pittsburgh is situated in a beautiful plain, on a point of land where the Allegheny and the Monongahela unite to form the Ohio. The site of the town was early regarded as very important, and was selected by the French for fort Du Quesne. Afterwards this was called fort Pitt. In 1760, a considerable town rose about the fort; but the present town was commenced in 1765. The Indian wars and other troubles of the western country prevented its rapid growth till 1793. It is now the rival of Cincinnati in manufactures, and, in population, wealth, and importance, is the third town in the Mississippi Valley. In its manufactures it resembles Birmingham. The inhabitants are a mixture of Germans, Irish, English, Scotch, French, Swiss, and many other nations, and are distinguished for industry and economy.

PIU (*Italian*); more; as *più presto*, quicker; *più piano*, more soft.

PIUS II. See *Piccolomino*.

PIUS VI., pope, whose secular name was *John Angelo Braschi*, was born at Cesena, in 1717. On the death of Clement XIV., in 1775, he succeeded to the papal throne, and shortly after made a reformation in the financial department, and also improved the museum of the Vatican. But the greatest of his undertakings was the draining of the Pontine marshes, a district between the Apennine mountains and the sea, overflowed with water exhaling pestilential effluvia, which gave rise to numerous diseases, and depopulated the surrounding country. While, however, this pontiff was successful in his domestic administration, he had the mortification to witness the absolute decay of the temporal power of the holy see. In 1782, he made a visit to the emperor Joseph II., at Vienna, to endeavour to dissuade him from the prosecution of some ecclesiastical reforms which he meditated; but the journey was wholly useless, though the death of the emperor put a stop to his schemes. Pius encountered many other misfortunes. In France, he witnessed the confiscation of the property of the church, and the suppression of the religious orders, by virtue of the decrees of the national assembly; in Germany, the congress of Ems, for the abolition of the nunciature, in 1785; in Naples, the contempt of his authority, by withholding the customary tribute of a horse; and, in 1791, he lost Avignon and the country of Venaissin, which were reunited to France. But all this was only the prelude to greater adversity. In the first coalition against France, the pope ranged himself among the enemies of the republic. In January, 1793, Basseville, the French secretary of legation, was massacred during a popular commotion at Rome. After the victories of Bonaparte in Italy, in 1796, general Augereau marched into the territories of the pope, who, unable to resist, was glad to accept an armistice, which was signed at Bologna, June 13. The pope having renewed hostilities, Bonaparte attacked and beat his troops at Senio, Feb. 2, 1797, and proceeded towards Rome. He stopped, however, to treat with ministers sent by his holiness, and, Feb. 19, was signed the treaty of Tolentino, by which the pope lost Romagna, Bologna, and Ferrara. Dec. 28, 1797, in consequence of another commotion, in which general Duphot was killed, Joseph Bonaparte, the French ambassador, quitted Rome. An army, commanded by general Berthier, entered that capital, Feb. 10, 1798, and, on the 15th, proclaimed the establishment of the Roman republic, governed by consuls, a senate and a tribunate. The pope, after this deprivation of his authority, was conveyed to France as a prisoner, and died at Valence, Aug. 29, 1799. In 1802, his body was removed to Rome, and solemnly interred.

PIUS VII. (GREGORY BARNABAS CHIARAMONTI) was born at Cesena in 1742, and, at the age of sixteen, was received into the order of Benedictines. After serving as teacher in several abbeys, he became professor of philosophy in Parma, and subsequently of theology in Rome, where his fellow-townsman, Pius VI., created him bishop of Tivoli, and, in 1785, cardinal and bishop of Imola. By the peace of Tolentino, he became a citizen of the Cisalpine republic, and displayed an inclination to republican principles. It appears to have been under French influence that he was chosen to fill the papal chair, March 14, 1800, after which his notions underwent a total change. His domestic administration was conducted with a rigorous economy and a wise policy in the encouragement of commerce and manufactures. In 1801, he concluded a concordate with France; in 1804, revived the order of Jesuits in Sicily, but was obliged to consent to the sale of the church lands by the Spanish court. Pius, desirous of saving the wreck of the papal power, complied with the invitation of Napoleon to be present at the coronation; but he was treated with little respect, either by the Parisians or by the emperor, who crowned himself and the empress with his own hands. The pope, finding that he was to expect no favours, refused to appear at the coronation in Milan, and was received by his subjects, on his return, (April 4, 1805,) with loud expressions of dissatisfaction. The reforms of Joseph in Naples, and the secularizations in Germany, were new sources of mortification, and, having offended Napoleon by refusing to recognize his brother Joseph as king of Naples, and to shut his ports against English ships, he was obliged to witness the occupation of Rome by French troops (February 2, 1808). The papal cities were incorporated with the kingdom of Italy, and the firm resistance of Pius to these aggressions, and his threat of excommunicating the emperor, could not prevent Rome from sharing the same fate (May 17, 1809). June 10 and 11, the pope issued two bulls of excommunication against all violators of the papal territory. July 6, he was arrested in his chamber by French troops, and, on refusing to renounce all claims to temporal power, conducted to Florence, and thence to Savona. In his confinement, he rejected with firmness the offers of Napoleon, and refused to confirm the bishops appointed by the latter. In 1812, he was removed to Fontainebleau, where Napoleon obliged him to accede to a new convention (Jan. 23, 1813), by which he promised to confirm the bishops; but the emperor having, contrary to agreement, proclaimed the concordate before its completion, Pius, whose consent had been entirely conditional, refused to concur in any concordate that should not settle all disputed points. He was therefore treated as a prisoner; but it is not true that he was personally abused by Napoleon. In 1814, the pope was released and restored to the possession of all the papal territories except Avignon and Venaissin in France, and a narrow strip of land beyond the Po. Although attached to the old hierarchal policy, as appears from his bulls and briefs against the distribution of the Bible, against Catholic Switzerland, &c., yet none of his plans for restoring the old state of things, except the revival of the Jesuits, August 7, 1814, were successful. The concordates with France, Bavaria, and the two Sicilies, and the convention with Prussia, were, however, triumphs of the policy of the Roman court. His administration, which was moderate and wise, was much indebted for its character to cardinal Consalvi, his intimate friend and minister. Rome became again not only the refuge of fallen princes and proscribed families, but the seat of the fine arts. Pius VII. died in consequence of a fall, July 6, 1823, and was succeeded by Leo XII. In his exterior, he was simple; in disposition, devout, benevolent, and mild.—See Gaudet's *Esquisses Historiques et Politiques sur Pie VII.* (Paris, 1824); and the *Storia di Pontificato di Pio VII.* (Venice, 1815).

PIUS VIII. (Francis Xaviero Castiglione) was born at Cingolia, a small town in the States of the Church, in 1759, of poor but respectable parents. He was early distinguished for his industry, talents, and learning, and having entered the church young, passed through all the orders of the hierarchy, having been created cardinal by Pius VII., and March 31, 1829, unanimously elected pope by the conclave of cardinals, on the death of Leo XII. Pius VIII. died December, 1830, and was succeeded by Clement XVI.

PIZARRO, Francisco; the name of a celebrated Spanish adventurer, one of the conquerors of the new world. His origin and early habits were sufficiently humble, he being the fruit of an illicit connexion between a peasant girl and an hidalgo of Truxillo, in the neighbourhood of which place he first saw the light about the close of the fifteenth century. Receiving neither support nor countenance from his father, he was thrown entirely upon his mother's resources, who, so far from being in circumstances to give him even an ordinary education, employed him as a swineherd, and left him totally illiterate. The spirit of adventure which at that period pervaded Spain, induced him at length to quit his inglorious occupation, and, in company with some other soldiers of fortune, to seek an improvement of his condition by a voyage of discovery towards the newly found continent of America. In 1525, the adventurers, over whom the enterprising disposition and daring temper of Pizarro had gained him considerable influence, sailed from Panama, Diego Almagro, a person of as obscure an origin as himself, and Hernandez Lucque, an ecclesiastic, being joined with him in the command. The Spaniards arrived, after experiencing several difficulties in Peru, where, taking advantage of a civil war then raging in that country, they became the allies, and, eventually, the enslavers, of Atahualpa, or Atabalipa, as he is variously called, the reigning inca. Treacherously seizing upon the person of the monarch, at a friendly banquet to which they had invited him and his whole court, they first compelled him to purchase, at an enormous price, a temporary reprieve from a death which they had determined he should eventually undergo; and, having succeeded in extorting from him, it is said, a house full of the precious metals by way of ransom, after a mock trial for a pretended conspiracy, condemned him to be burnt, allowing him to be first strangled, as a reward for becoming a Christian. The news of their success brought a considerable accession of strength from Europe to the invaders; and Pizarro, in order to consolidate his empire, founded, in 1535, the city of Lima, which he intended as the capital of his possessions; but the discord between the chiefs of the expedition, which even a sense of their common danger had from the beginning failed wholly to suppress, when this, their sole bond of union, was withdrawn, broke out into open violence, and, in the struggle which ensued, Almagro, now in his seventy-fifth year, was defeated, taken prisoner, and strangled, by Ferdinand Pizarro, brother to the general. This catastrophe, which took place in 1537, was avenged four years afterwards by the son of the victim, and bearing the same name, who, having organized a conspiracy against the destroyers of his father, broke into the palace at Lima, and, after an obstinate resistance, succeeded in despatching Francisco Pizarro. It is impossible to refuse to this adventurer the credit of considerable military as well as political talent, though the one was sullied by his extreme barbarity, the other by his perfidy and heartless dissimulation. His assassination took place, June 26, 1541. See *Atahualpa* and *Peru*.

PIZZICATO, or **PIZZ.** (*Italian*); an expression particularly applicable to violin music, and implying that the movement, or the passage over which it is written, is to be performed by the fingers instead of the bow.

PLACE, LA. See *Laplace.*

PLAGIARISM. See *Plagium.*

PLAGIUM, in the Roman law, is the crime of stealing the slave of another, or of kidnapping a free person, in order to make him a slave. According to German law, it is the getting forcible possession of a man's person, so as to restrain him of his liberty. Metaphorically, it is used for the act of stealing the thoughts and words of another, by publishing them as one's own. Plagiarism, though often practised, is not unfrequently charged where a second invention has taken place, since the most striking figures, for instance, are those which are most likely to suggest themselves to a variety of persons. The idea of raising all the roofs of a city, and looking into the interior of the houses, used by Quevedo and Le Sage, might easily occur to a person unacquainted with their works, as the writer has had occasion to know. Such repetitions of course become more and more likely in proportion as the number of books and educated men increase.

PLAGUE; a disease characterized by a contagious typhus, and entire prostration of the strength, and certain local symptoms, as buboes, carbuncles, and livid spots (*petechiæ*). The latter are in this connexion the peculiar characteristics of the plague, since the former also appear in other malignant diseases. In the beginning, the patient generally experiences great mental dejection and debility of body, slight chills alternating with heats, which are afterwards succeeded by a burning heat within, and a heaviness about the head; then follows stupor; the eyes are glaring, glazed, or wild and sparkling; the face appears whitish and livid, and the patient is melancholy, morose or anxious, faint and delirious. In many cases, nausea and vomiting occur. The thirst is unquenchable, the tongue reddish or yellowish, the speech indistinct. In the progress of the disease, the face often becomes red, the respiration quick and uneasy, and bilious, green, or bloody and black matter, is vomited. The delirium often becomes fierce; the urine is sometimes turbid, black, whitish, or bloody; and hemorrhages take place, when death does not immediately ensue; buboes appear in the groins, the arm-pits, the parotids, and other places, with carbuncles, small, white, yellowish, black spots, over the whole body. The fear, anxiety, and despair, which seize the patient with the first appearance of the plague, increase the danger of the disease. Death, in many cases, takes place on the first day, and frequently in a few hours after the appearance, but sometimes not till the second or third day. It is considered favourable if the buboes and carbuncles appear at the same time, are very numerous, and terminate in suppuration. They either terminate in suppuration, or become indurated, are healed, or cut out.

In regard to the origin of the plague, and the manner in which it is communicated, very different opinions have been entertained, according to the state of medical science. In early times, when calamitous events, the causes of which were not understood, were attributed to spirits and demons, the plague was also ascribed to their influence. At a later period, it was accounted for by changes in the air, poisonous vapours which descended from the atmosphere, or to clouds of insects which were received into the body by inspiration, or in the food, or by absorption through the skin, and thus corrupted the blood. Physicians, according to the tendency of their theories, found the cause in the excess of sulphureous matter in the blood, or in its coagulation or resolution, &c. Many have considered it as not contagious: at present, most have been convinced by experience of its contagious character.[*]

The plague is a specific disease, and can originate of itself only in certain countries. Hot weather, bad air and food, and filthiness, favour its production and propagation.[†] The nature of the disease seems to consist in a diminution of the vital energy, which may be so rapid and universal, that the component parts of the system, particularly the blood, lose their natural properties, and become corrupted, and life is destroyed before the nervous system is able to counteract the effects. When the progress of the disease is not so rapid, the vital energy which remains is exhausted by febrile excitements and local inflammation. Dissections have shown collections of coagulated or decomposed fluid, black blood, inflammations of large portions of the skin, and carbuncles in great numbers. The buboes discharge an offensive matter, and extend far inward. The carbuncles which precede the approach of death, and contain dead parts, also generally reach deep inwards. When nature possesses sufficient vigour, the inflammations are on the skin rather than in the interior. The buboes soon terminate in suppuration, and the carbuncles, when cut, discharge a less corrupt matter, and fall off. The fever is carried off by a violent sweat: the recovery is slow. When the disease is completely developed, it is contagious: to this are owing the terrible devastations which it causes.

There is little doubt that the plague appeared in the most ancient times, particularly where a numerous population was crowded together in the warm climates; but we must not consider every disease as the plague which has been so called by historians, as they often mean by the term nothing more than a malignant disorder prevailing over a considerable extent of country. Among the most famous instances is the plague described in so masterly a manner by Thucydides, which, in the third year of the Peloponnesian war (430 B. C.), ravaged Athens, then besieged by the Spartans. A large number of the inhabitants of Attica had fled into the city: fear, anxiety, want, or badness of provision, and the corruption of the air, caused by the crowded state of the population, produced and propagated the plague in the city. Death generally ensued on the seventh or ninth day. The plague in Jerusalem (A. D. 72,) when it was besieged by the Romans, is described by Josephus. In Rome, the plague existed (A. D. 77) in the reign of Vespasian; of Marcus Aurelius (170,) when it raged over almost all Europe and Asia; of Commodus (in 189), and particularly of Gallienus (in 262), when 5000 persons are said to have died daily in Rome. From that time, the plague has always continued to exist in Italy, Greece, Asia, and Africa, and raged particularly in the populous cities, for instance in Constantinople, in the reign of Justinian, in 544, when 1000 grave-diggers are said to have been insufficient for the interment of the dead. This terrible plague continued its ravages for fifty years, with but short intervals. In 565, it appeared under the name of *pestis inguinaria*, in Treves, in 588 in Marseilles. In the seventh century, it was in Saxony. In 823, it prevailed all over Germany, and, from 875 to 877, was particularly malignant in Saxony and Misnia, as was also the case in 964. In the eleventh century, it broke out in Germany at least six times, mostly after or during a famine, and raged with so much violence that it was believed that all mankind was doomed to be swept away by it. This unfortunate belief prevented the taking of effectual means to check it; and apathy in suffering was considered as an act of piety. In some cases, however, the Jews were suspected of having poisoned the wells, as, in our own times, the Hungarian peasantry suspected the nobility, when the cholera morbus swept away so many of the poorer classes: in fact, the ignorant of all ages have been inclined to ascribe general and far-spreading diseases, whose true causes are unknown, or disbelieved by them, to poisoned wells. Thus the writer recollects that, when the ophthalmia broke out in the Prussian army in 1813, many believed the French had poisoned the wells. Similar notions were entertained by many French soldiers during the plague which swept them off in Egypt. In the twelfth century, the plague prevailed in Germany above twenty-five years. In the thirteenth century, it was brought into Europe by the crusaders. From 1347 to 1350 it traversed all Europe, and was then called the *black death*. Since that time it has never raged with so much violence. Boccaccio, in the introduction to his *Decameron*, has given a lively description of its physical and moral effects in Florence in 1348. In the latter half of the fifteenth century, it raged in all Europe, and was accompanied with the most terrible sufferings. The historians of that time give the most horrible picture of distress. In the sixteenth century, the plague again raged, and, in 1563, was introduced into England, by the return of an English army from the continent. At the same time, the sweating sickness prevailed on the continent, which had been imported from England, towards the close of the fifteenth century: it was called in Germany the *English sweat*, and spread from the seaports over Germany, France, the Netherlands, Italy. Though some means were already taken against the plague, for instance, lazarettos built, yet it raged in Europe during the seventeenth century. In 1603, 1625, 1636 and 1665, it made great ravages in England. As the plague never entirely ceases in the East, in Greece, and European and Asiatic Turkey, it has continually been introduced by vessels into the ports of Italy and France, and has also been propagated in Western Europe, through Hungary, Poland and Transylvania. The quarantine rules have not in general, been strictly observed, and, as late as 1720, a Levantine vessel imported the plague into Marseilles, which soon spread all over Provence. In 1795 and 1796, it extended over the countries on the Turkish frontiers, but was checked by the skill of the physicians.—See *History of the Plague in Sirmia* (in German).—It broke out in 1816 at Noia, a town in Naples.

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[*] Doctor Madden, who paid much attention to this subject, says, "I am thoroughly persuaded that plague is both contagious and infectious; at one period epidemical, at another endemical; in plain English, that the miasma may be communicated by the touch or by the breath; that in one period it is confined to a particular district, and at another is disseminated among the people. But if plague have one form more decided than another, it is the endemic." He considers, however, that the contagion generally derives its violence and virulence from want of ventilation, the plague chambers in the East being generally closed and crowded with patients, by which means the air in them is rendered extremely foul.—See Let. XVIII., in his *Travels in Turkey, Egypt, &c.*

[†] "Both plague and malaria," says Doctor Madden, "have their origin in putrefaction, exhaling an invisible vapour, which can only be estimated by its consequences. Malaria originates in the decomposition of vegetable matter. Plague, according to my opinion, originates in the putrefaction of animal matter. The production of both, of course, depends on certain states of moisture and heat, which, in other places, of even a damper climate and higher temperature, are wanting to the generation of these diseases."—Mad. *ub sup.*

The ancients endeavoured to avert the plague by sacrifices, the Christians by processions and prayers. The ancient physicians tried several modes of treatment, among them sweating. The researches of modern physicians have given us a greater insight into the nature of the disease, and of its remedies, than were possessed formerly, when want of courage was quite as fatal as want of knowledge. Precautions against contagion, and when that has once occurred, the speedy expulsion of the poison from the system, the diminution of the internal inflammation, the preservation of the vigour of the arterial blood, the strengthening of the nerves, the promotion of suppuration, the seasonable resolution of the carbuncles, are the main points of the treatment. Baldwin, English consul-general at Alexandria, recommended, (1795) oil friction, which has been tried with success. Having observed that the oil porters were never attacked, he concluded that olive oil was a preservative against the plague; and his expectations were surpassed by the favourable results of his process. As soon as any symptom of the plague is perceived, the body of the patient is vigorously and quickly rubbed with warm oil, and the patient is put to bed. This application is followed by a profuse sweat, which is promoted by elder tea. The friction is repeated once or twice a day, until a violent sweat is produced. If there are buboes, they must be frequently rubbed with oil, until suppuration follows.

Doctor Madden, in the work already quoted, gives the following as the results of his experience, both in regard to the nature of the disease, and the treatment of it: "I have given plague the name of *typhus gravissimus*. The symptoms, from the first, are general debility, congestion about the heart, not depending on inflammation, but on the putrescent state of the circulation. It differs little from putrid typhus, except in its duration and eruptions. In every stage of plague, nature appears to lie prostrate under the influence of the poisonous miasma; and, when the patient sinks at last, it is from the want of force in the constitution to drive out the eruptions on the surface. The bubo recedes, or the carbuncle diminishes, or neither appear at all externally; but they have seized on the internal vital organs, and the immediate cause of death has been shown by dissection to have been carbuncles on the liver, lungs, spleen, or mesenteric glands: in short, it appears that the whole glandular system is the seat of the disease. I have seen all the different species of plague enumerated by Russel and the French authors, and I have no hesitation in pronouncing all these different species of plague to be the symptoms of one class only; and I assert, there is but one indication to fulfil, namely, to assist nature to expel the poison by strengthening the exhausted powers of the constitution, and enabling it to throw out the morbific matter. By what means is this to be done?—whether by emetics, by purgatives, by bleeding, by calomel, by mercurial unction, or by oil friction? There is none of these means I have not tried, and out of the first eleven patients so treated I lost nine. I had recourse to another mode of cure; strong stimulants, diffusable and permanent, I now tried. I commenced with wine and brandy the first moment I saw the patient. Whether the eye was suffused, the cheek flushed, and the skin arid, or the low delirium set in or not, I administered it in the following manner: The first dose was a tumbler of hot brandy and water, about one third spirit. This sometimes was vomited, and again repeated: the second time it usually remained on the stomach, and, in the course of two hours, it generally produced perspiration, even after James's powder had failed. Two or three hours after the first dose, another was exhibited, and the patient would feel less of the burning pain at the heart. If vomiting supervened, it was again repeated; and during the day, it was now given every four or six hours, according to circumstances. The buboes commonly increased in size, and profuse sweating was often followed by *petechiæ*, or livid spots on the chest: when I saw this, I was always sure of my patient. The second day, I increased the strength of the dose; instead of one-third spirit, I gave one-half, every eight hours: no intoxication came on, but a lethargic drowsiness was common enough, continuing till the perspiration broke out, or carbuncles appeared externally. If, on the third day, the patient was decidedly better, I kept up the excitement with strong Cyprus wine, in frequent but small doses of two table-spoonsful every two hours; but, if the bad symptoms were unabated, I continued to give the hot brandy and water in increased quantities, till some decided change took place. This active treatment it was seldom necessary to pursue beyond the sixth day; indeed, in plague, if the patient live to the sixth day, he is very likely to recover; but the third day is that which is most to be feared. The only other treatment was once or twice opening the bowels with enemas, for purgatives by the mouth do no service, and sponging the body frequently with vinegar and water; the head was constantly kept soaked with towels dipped in vinegar, and the buboes were poulticed with very hot cataplasms, sufficiently hot to give pain, and they were allowed to burst spontaneously. With this treatment, at the rate of seventy-five per cent. recovered. In Candia, of nine patients, five recovered; and some of these were almost hopeless cases when I began to treat them. Every thing in plague of course depends on early treatment; for, in a disease which commonly runs its course in three days, there is no time to be lost."

PLAIN-SONG; the name given to the old ecclesiastical chant, when in its most simple state, and without those harmonic appendages with which it has long since been enriched by cultivated science.

PLANE, INCLINED. See *Mechanics*.

PLANETARIUM. See *Orrery*.

PLANE TREE. The Occidental plane, or buttonwood (*platanus Occidentalis*), is, among deciduous trees, the largest production of the American forest. It abounds most and attains the largest size along the interior waters of Pennsylvania and Virginia, and especially along the banks of the Ohio. Here stocks are sometimes found from ten to fourteen feet in diameter, often beginning only to give out their vast branches at the height of sixty or seventy feet, and near the summits of the surrounding trees. At other times, this tree divides at the base into several huge trunks, equally surpassing its neighbours in bulk. A moist and cool soil seems indispensable, for it is never found on dry grounds. In the Western States, this tree is usually known by the name of *sycamore*, and in some districts is called *cotton-tree*. The trunk and branches are covered with a smooth, pale-green bark, the epidermis of which detaches itself in portions; the roots, when first taken from the earth, are of a beautiful red colour, which disappears on exposure to light in a dry place; the leaves are alternate, palmated, or lobed; and the flowers are united in little globular, pendent balls. The wood, in seasoning, takes a dull red colour, is fine-grained, and susceptible of a good polish, but speedily decays on exposure to the weather. When thoroughly seasoned, it may be used in the interior of houses, but the defect of warping is attributed to it, and cabinet-makers rarely employ it except for bedsteads, which, when coated with varnish, retain their colour.

The oriental plane, so celebrated by the ancients for the majesty of its appearance, resembles the preceding in every respect, and bears the same relation to the forests of Western Asia. The wood, in those regions where it abounds, is frequently employed in the arts, and is said to acquire great hardness by being kept under water for some years.

PLANETS (from πλανάω, to wander); moving stars, which shine by reflecting the light of the sun, around which they revolve. Homer and Hesiod were already acquainted with Venus, but considered the morning and evening stars as two different bodies. Democritus supposed that there were several planets. Pythagoras discovered the identity of the morning and evening stars; and, in the fourth year before Christ, Eudoxus brought the knowledge of the motions of the five planets then known, from the Egyptians to the Greeks. In addition to these five planets, Mercury, Venus, Mars, Jupiter, and Saturn, five others have been discovered in modern times: Herschel (Georgium Sidus, or Uranus), Ceres, Pallas, Juno, and Vesta; so that, including the earth and moon, there are now known eleven primary and eighteen secondary planets (satellites, or moons). Like the earth, many of them, if not all, have the motion of rotation on their axis, whence arise day and night, and a common motion around the sun, around which they revolve from west to east, through south, in elliptical orbits, generally making a small angle with the ecliptic in different times, depending on their distances from the sun.

The planet nearest the sun is *Mercury*, though thirty-seven millions of miles distant from it. It completes its revolution around the sun in eighty-eight days, moving with a velocity of 315 miles a second. It is the smallest of the six old planets, its bulk being only one-eighteenth of that of the earth. Its time of rotation on its axis is twenty-four hours, five and a half minutes, and its eccentricity is much greater than that of either of the other five old planets, or of Uranus.

Next to Mercury is placed *Venus*, at a distance of sixty-eight millions of miles from the sun, around which it revolves in 225 days, having a mean velocity of twenty-one miles a second. It turns on its axis in twenty-three hours twenty-one minutes, as is known from observation of the spots on its surface. Mountains have also been observed in it, the height of some of which is computed to exceed eighteen miles. Seen from the earth, Venus and Mercury exhibit phases similar to those of the moon, sometimes appearing nearly full, sometimes half illuminated, or in the form of a crescent, and sometimes becoming invisible by turning to us the dark side. In size, Venus is nearly equal to the earth, and in her perigee approaches it within 27,600,000 miles, though in her apogee, she may recede 165,600,000 miles from it. We have no certain knowledge of a moon belonging to Venus; the supposed discovery of one seems to have been founded on a mistake. Mercury and Venus appear, at times, like black spots passing across the face of the sun, whenever, in their motion in their orbits, like the moon in solar eclipses, they enter the plane of the ecliptic within a few hours of their inferior conjunction. This phenomenon is called a *transit* of Mercury or Venus. A transit of the latter planet is of rare occurrence, two only taking place in about 120 years. Those of Mercury are much more frequent. The next transit of Venus will take place in 1874. These two planets, which are nearer to the sun than the earth, are called the *inferior* planets, and those more distant are called the *superior*.

Next in order to the earth (q. v.) and its moon (q. v.) is *Mars*, 143 million miles distant from the sun. In its orbit, which it accomplishes in one year and 322 days, it moves with a velocity of fifteen miles a second. It is flattened at the poles about one-sixteenth of its diameter, and turns once in twenty-four hours thirty-nine minutes on its axis, which is inclined to the plane of its orbit at an angle of sixty-one degrees. The surface of Mars is about one-fourth that of the earth, and, his density being less, the quantity of matter is only one-seventh. Spots and belts are often observed on Mars; from which it is conjectured that it has a dense atmosphere.

Between Mars and Jupiter there is a great distance, which led to the supposition that there was some body between them; and this conjecture was verified, in the beginning of this century, by the discovery of four new planets. January 1, 1801, Piazzi, at Palermo, discovered *Ceres*, which, at a distance of 263,000,000 miles from the sun, completes its revolution in four years seven months, moving with a mean velocity of 11¼ miles a second. On account of its small size, it is not visible to the naked eye, and, viewed through a telescope, has the appearance of a star of the seventh magnitude.

This discovery was followed, March 28, 1802, by that of *Pallas* by Olbers, at Bremen. It is about the same distance from the sun, and accomplishes its revolution in about the same time as Ceres. It is supposed to be rather larger than either Vesta, Juno, or Ceres. This planet is distinguished from every other by the great inclination of its orbit to the ecliptic.

Juno, which revolves around the sun in four years and four months, commonly appears like a star of the eighth magnitude, and was discovered Sept. 1, 1804, by Harding, at Lilienthal.

Finally, March 29, 1807, Olbers discovered *Vesta*, which appears of the fifth to the seventh magnitude, is 225,000,000 miles from the sun, and completes its revolution around the sun in three years and eight months.

Jupiter, the largest of the known planets, at a distance of 490,000,000 miles from the sun, accomplishes its revolution, at the rate of seven miles a second, in eleven years and 314 days, and is attended by four moons, which were discovered by Galilei at Florence, January 7, 1610, and the largest of which has a diameter nearly equal to the semi-diameter of the earth. The diameter of Jupiter itself is 11½ times greater than the diameter of the earth; its surface is 118 times, and its bulk 1281 times greater than that of the earth. In nine hours fifty-six minutes it revolves on its axis, which is inclined at an angle of eighty-seven degrees to its orbit, and at the poles it is flattened one-fourteenth of its diameter. On the surface of this planet belts parallel to the equator are usually observed.

At nearly twice the distance of Jupiter, or 900 million miles from the sun, *Saturn* passes through its orbit, 5760 million miles in length, in twenty-nine years and 169 days, accompanied by seven moons (of which five were discovered in the seventeenth century by Huygens and Cassini, two in 1789 by Herschel), and by a very remarkable double ring, which is 21,000 miles from the surface of the planet, and 27,000 miles in breadth; and the interval between them is about 3000 miles. According to Herschel, this ring completes its rotation in ten hours thirty minutes, while that of the planet itself is ten hours eighteen minutes.

Finally, the knowledge of our solar system was enlarged, March 13, 1781, by Herschel's discovery of the *Georgium Sidus* (*Herschel, Uranus*), which is 1800 millions of miles distant from the sun, and, accompanied by six satellites, accomplishes its revolution in eighty-four years nine days, at the rate of about four miles a second. Its surface is nineteen times larger than the earth's, but so much less solid, that its quantity of matter is only 17½ times larger.

To render the vast distances from the planets to the sun more comprehensible, an illustration, addressed to the senses, is often drawn from the velocity of a cannon-ball, moving at the rate of eight miles a minute. With this velocity a cannon-ball would go from the sun to Mercury in nine and a half years, to Venus in eighteen, to the earth in twenty-five, to Mars in thirty-eight, to Vesta in sixty, to Juno in sixty-six, to Ceres and Pallas in sixty-nine, to Jupiter in 130, to Saturn in 238, and to Uranus or Herschel in 479, while it would go from the earth to the moon in twenty-three days.

PLANIMETRY; that part of geometry which considers lines and plane figures, without any regard to heights or depths. Planimetry is particularly restricted to the mensuration of planes and other surfaces, as contradistinguished from *stereometry*, or the mensuration of solids, or capacities of length, breadth, and depth.

PLANISPHERE; a projection of the sphere, and its various circles on a plane, as upon paper, or the like. In this sense, maps of the heavens and the earth, exhibiting the meridians and other circles of the sphere, may be called *planispheres*.

PLANT. See *Botany*.

PLANTAGENET, FAMILY OF. See the article *Britain*.

PLANTAIN (*plantago major*); a common weed, the leaves of which are all radical, oval, and petiolate, and from amongst them arise several long cylindrical spikes of greenish inconspicuous flowers.

PLANTAIN-TREE. This name is frequently applied to a species of banana (*musa paradisiaca*), now cultivated in all tropical climates. The stem of this plant is soft, herbaceous, fifteen or twenty feet high, with leaves often more than six feet long, and nearly two broad. The spike of flowers is nearly four feet long, and nodding. The fruit, which succeeds the fertile flowers on the lower part of the spike, is eight or nine inches long, and above an inch in diameter, at first green, but when ripe, of a pale-yellow colour, and has a luscious, sweet pulp. It is one of the most useful fruits in the vegetable creation, and, as some of the plants are in bearing most of the year, forms the entire sustenance of many of the inhabitants of tropical climates. When used as bread, it is roasted or boiled when just full grown; and when ripe, it is made into tarts, sliced, and fried with butter, or dried and preserved as a sweetmeat. Three dozen plantains are esteemed sufficient to serve one man for a week, instead of bread, and will support him much better.

PLASTER OF PARIS. See *Gypsum*.

PLASTIC, in the English language used as an adjective only (from the Greek *πλαστικος*, from *πλασσω*, I form or shape); but in some other languages a word exists, to which, in English, *plastics* would correspond (Greek *πλαστικη*). The term is of much importance in the theory of the arts, and in criticism. With the Greeks, Germans, &c., it comprises the whole art of shaping figures from hard or soft masses. Three species are distinguished:—1. The art of shaping forms from soft masses, as clay, wax, gypsum, wheat-flour—the *ars plastica* proper, according to the original meaning of *πλασσω*: it precedes sculpture: 2. Sculpture, or the art of making statues of harder masses (e. g. marble, alabaster, sandstone)—the *ars statuaria*: 3. The *sculptura* of the ancients, comprising works cut in wood and ivory. The materials which the ancient artists used chiefly were, 1. Clay. Dibutades of Sicyon invented among the Greeks figures of clay. There are very ancient figures of this kind, of Greek and Egyptian origin. 2. Gypsum, used for stucco-work, and still found in antique buildings. The art of casting in gypsum was not known to the Greeks till late. Lysistratus, brother to Lysippus, who lived in the time of Alexander, invented it. Mengs, among the moderns, has devoted great attention to this art. In

Dresden and Madrid are collections of his casts, taken from the finest works of the plastic art in Italy. (See *Mengs.*) 3. Wax. The same Lysistratus invented the art of casting figures of wax. The Roman images were formed of wax, and numberless figures, parts of bodies, &c., are made of it at present in Catholic countries, as offerings to be presented to saints. 4. Wood. The Greeks made many works of wood, from the earliest times to the most flourishing period of art. Wooden statues were erected to the victors in the Olympic games. 5. Ivory. The use of this material for plastic works is also very old, and the Greeks continued to use it much in the times of their highest perfection. The naked parts of the Olympian Jupiter and Minerva, in the Parthenon, were of ivory. 6. Stone. (*a*) Marble. Among the ancients, the Pentelican and Parian marbles were the most celebrated. Under Vespasian were discovered the Lunensian quarries, at present called *Carrara* quarries, the marble of which is whiter than the Greek. The Vatican Apollo is made of it. (*b*) Alabaster. The Etrurians worked much in it: the Indian was most esteemed. (*c*) Basalt. (*d*) Granite. Only the Egyptians worked in this; their statues and obelisks are generally of granite and sienite. There are two sorts of the granite, a red and a bluish sort. (*e*) Porphyry, of which there are also two sorts, one red, the other greenish, with golden spots. This, the hardest of all stones, was yet frequently wrought by the ancients into statues, as well as vases. (*f*) Egyptian lime-stone, soft and white, or dark green. 7. Glass, the invention of which is very old. The ancients made of glass not only many utensils for domestic purposes, but also urns of the dead, and great drinking vessels, ornamented with raised work, or cut. Obsidian must be mentioned here, a kind of mountain-crystal, discovered by a certain Obsidius. (See *Pitchstone.*) 8. Murrhinum. (See *Murrhine Vases.*) It is probable that it was a kind of Chinese steatite. 9. Metal. (*a*) Gold, partly employed for entire statues, partly for the covering of ivory statues. (*b*) Silver. (*c*) Bronze. This metal was very much used; the best ore for preparing it was obtained by the Greeks from the islands of Delos and Ægina; at a later period, the Corinthian became the most popular. The most common mixture was 12¼ parts tin to 100 copper. Metals were at first wrought with the hammer; at a later period they were cast. At first, figures were cast in several pieces, which were united by *swallow tails*, so called, shaped thus, ≍; at length the art of casting whole figures was invented, but it afterwards went out of use; and it was not till the sixteenth century that the Italians began again to cast large bronze figures. The first large statue cast in Italy was that of Pope Paul III. by Guglielmo della Porta. In 1699, the first great work in bronze was cast in Paris. The first of all the figures cast in bronze is ascribed by the Greeks to Rhœcus and Theodoros of Samos. (*d*) Iron, which was the last used for plastic purposes. Glaucus discovered the art of casting iron; at Delphi were consecrated offerings made by him. Never was the art of casting in iron carried to greater perfection than in our times, particularly at Berlin. See *Sculpture.*

Plastic, in its narrowest sense, signifying that which is fit to be represented in forms, or is well represented in forms, is opposed to *picturesque* in its widest sense, signifying that which is fit to be represented, or is well represented, in painting. Intimately connected with the general difference between the spirit of ancient and that of modern art, to which we have already often alluded, is the circumstance that the Greeks had a much greater disposition to express their ideas in forms than in pictures, so far as the fine arts are made use of for the expression of ideas. They accordingly carried the arts which speak through the form to the highest perfection; i. e. the plastic arts. The religion and prevailing sentiments of the Greek led him to view this life as the most important part of his existence, and the perfection of this life as the chief perfection to which he could aspire; whilst the modern, or Christian, considers every thing with reference to a future life, to which he aspires. The chief aim of the latter, in the fine arts, therefore, is the expression of glowing feeling. He makes the forms and beings which he finds on the earth express his views of a more perfect and purer world for which he longs (and colours and tones are the most ready means of so doing), whilst the Greek embodies all his ideas in forms to which he does not attempt to give an expression superior in kind to the terrestrial, like the Christian, but merely idealizes them, i. e. developes their excellences so as to give them what would be terrestrial perfection. On the whole, we may say the ancients strove much more to represent the beautiful for its own sake, whilst with the moderns it is made subsidiary to the expression of feeling. Hence the necessary consequence that, wherever it was admissible, the Greeks represented naked human beauty, the most perfect in creation; and to such a degree did that gifted and finely organized people develope their sense of beauty, and the power of embodying it in forms, that they have ever since remained the models of successive ages. So great and general, indeed, was the sense for plastic beauty with the Greeks, that it influenced most of the other branches of art, as painting, which has with the Greeks a decidedly plastic character; and Schlegel is quite correct when he says that, in order to understand perfectly well the tragedy of the Greeks, it is necessary to be thoroughly acquainted with their plastic art, because the mind of the Greek has, in every thing connected with the beautiful, an eminently plastic turn; and the poet does not develope before our eyes great and peculiar characters by a series of events and actions, nor does he present views which are the consequence of connecting all our present existence with another world; but he conceives the existing world idealized, perfected by its own laws, and, if he composes for representation, this view closely allies itself to the spirit which pervades the sculpture of his country.

Plastic is also used in praise of modern poems or historical writing, if they are so well executed that they represent characters or actions as expressively as a sculptor would do by a fine statue.

PLATA, RIO DE LA (that is, *river of silver*); a large river of South America, which flows into the Atlantic ocean between latitude 34° 55′ and 36° 21′ S. It is formed by the union of the Parana and Uruguay. The former rises in Brazil, and receives the Paraguay coming from the same country, after which it unites with the Uruguay, also coming from Brazil, at about 175 miles from the ocean. At this point the Plata is thirty miles wide, at its mouth about 100 miles. The Paraguay rises in latitude 13° 30′ S., and receives the large rivers Pilcomayo and Vermejo from the west. The whole length of the Plata, from the head waters of the Paraguay to the ocean, is about 2300 miles. The basin which it drains extends from lat. 13° to 38° S., and from lon. 51° to 74° W., and is therefore about 1800 miles from north to south, by 1500 from east to west. Excepting the Amazon, it has the largest volume of water of any river in the world. The navigation of the Paraguay is difficult on account of the shoals and falls. The Parana is deeper than the Plata, and is rendered dangerous by its numerous sandbanks. The ports on the Plata are Montevideo and Buenos Ayres. It was first discovered by Solis, who gave it the name of *La Plata*, but from whom it was often also called the *river of Solis*. Sebastian Cabot, then in the service of Spain, visited the river a few years afterwards (1526), and penetrated to the Paraguay.

PLATA, United Provinces of the (***Provincias Unidas del Rio de la Plata***, or ***Republica Argentina***); a republic of South America, consisting of a part of the former Spanish viceroyalty of the Rio de la Plata, or Buenos Ayres. The republic of Bolivia, the state of Paraguay, and the republic of the Banda Oriental, which were comprised within the limits of the viceroyalty, now form independent states. The United Provinces are bounded on the north by Bolivia; on the east by Paraguay, from which they are separated by the river Paraguay, the Banda Oriental (which the Uruguay separates from them), and the Atlantic ocean; south by Patagonia; and west by Chile and the Pacific ocean. The extreme length, from lat. 20° to 40° 10′ S., is about 1400 miles; the breadth varies from 500 to 800 miles. The viceroyalty extended over an area of about 1,500,000 miles; the Argentine republic comprises about two-thirds of this surface, with a population estimated at 2,000,000, of which 600,000 are Spanish creoles, 600,000 mestizoes, 800,000 Indians, and 25,000 negroes.

This part of the country was first discovered by Juan Diaz de Solis, in 1517, and was further explored by Sebastian Cabot, then in the service of Spain, in 1526. In 1553, the first Spanish colony was founded here by Don Pedro de Mendoza, who built Buenos Ayres. The government was at first dependent upon that of Peru, and, in consequence of the restrictions imposed on its commerce, had no other communication with other parts of the world than by the annual fleet from Spain. But as the population multiplied, and the agricultural produce increased, some relaxations in the monopoly system took place, and finally, to put a stop to the smuggling, which had been carried on to a great extent, register ships were allowed to sail, under a license from the council of the Indies, at any time. The annual flotilla sailed for the last time in 1748; in 1774, a free trade was allowed between several of the American ports; and, in 1778, several Spanish ports were allowed an open trade to Buenos Ayres. In the same year, the viceroyalty of Buenos Ayres was constituted, and, as it included the rich provinces of Upper Peru, became not only important as an agricultural colony, but for its valuable mines. The commerce continued to increase in value until the war between England and Spain (1797), after which it never revived, and has been entirely annihilated by the recent events.

In 1806 and 1807, the inhabitants, having victoriously repelled the attacks of the British, under generals Beresford and Whitelocke, learned to know their own strength, and, in 1810, the first insurrection against the mother country broke out at Buenos Ayres. In none of the Spanish colonies were there so few blacks; none had been so much neglected by the mother country; hence in none were shown a greater unanimity of purpose, and firmness in resistance. The inhabitants of this colony were also superior to most of the colonists in cultivation and character. Liniers, a French officer who had conducted the successful resistance to the British, was declared viceroy in the place of the Spanish governor. But as he favoured the cause of Joseph Napoleon, he was soon after deposed, and the junta of the province of Buenos Ayres managed the government under Cisneros, the new Spanish viceroy; the latter, however, was deposed by the junta, on account of his attempts to revive the old Spanish policy and sent home. The junta took upon itself the administration, in the name of Ferdinand VII. Chile followed this example, and sent troops to the assistance of Buenos Ayres. The insurgents likewise took possession of Upper Peru, where an insurrection had already broken out at La Paz, August 16, 1809. Liniers, who was supported by some of the internal provinces, made an unsuccessful attempt against Buenos Ayres; he was deserted by his troops, and, having been made prisoner with some of his adherents, was shot. The other provinces joined Buenos Ayres, and the creoles were every where victorious. In 1811, the junta was dissolved, in consequence of the intrigues of its president; and a congress, assembled at Buenos Ayres, vested the executive power in the hands of a triumvirate; but the progress of the Spanish arms in Peru led the congress, in 1814, to name Pozadas, supreme director of the republic, with a council of seven; and the government thus acquired more unity and vigour. Monte Video was yet occupied by a Spanish garrison, but was soon after taken by the Buenos Ayrean forces; Artigas, the commander in the Banda Oriental, then declared himself independent, defeated the troops of Buenos Ayres, and took possession of Monte Video, which, in 1817, fell into the hands of a Brazilian force. (See *Artigas*, and *Banda Oriental*.) At the same time, Paraguay, under doctor Francia, declared itself independent. (See *Paraguay*.) In 1816, a new congress met at Tucuman, which named Pueyrredon director of the republic, on July 19, declared the countries on the Plata independent, and, having transferred its sessions to Buenos Ayres, issued a declaration (*Manifestacion historica y politica de la Revolucion de la America*, *Oct.* 25), containing a list of twenty-eight grievances.

The republic now assumed the title of United Provinces of South America, and December 3, 1817, proclaimed a *reglamento provisorio* as preliminary to a constitution. The congress, chosen in compliance with the *reglamento*, was opened in February, 1819, and, on the 25th of May, the new constitution was published. It was on the model of that of the United Northern States, and secured personal freedom and equality, liberty of conscience, and of the press, and the right of suffrage. Pueyrredon, who declined re-election to the place of supreme director, was succeeded in that post by general Rondeau. The country still continued in a disturbed state, and, in 1820, colonel Rodriguez was placed at the head of affairs by the federalists. The nomination of Rivadavia, who had previously been plenipotentiary to Paris and London, to the place of secretary of state in 1821, contributed to restore order; the province of Buenos Ayres yielded its claims to superiority over the other provinces, which established separate provincial governments, and sent deputies to a general congress at Buenos Ayres, May 1, 1822. The treaties of peace and amity, concluded with Santa Fé, Entre Rios, and Corrientes, restored peace, and general amnesty established domestic tranquillity. The confederacy now consisted of the nine provinces of Buenos Ayres, Tucuman, Cordova, Salta, Cujo, Potosi, Cochabamba, La Paz, and Puno. The vigilant and prudent policy of Rivadavia, who was also at the head of the department of foreign affairs, changed the condition of the country. The revenue of 1823 exceeded the expenditures; the customs, in particular, were much increased by the commercial prosperity. In 1822, the congress of the United States, considering that the provinces of Buenos Ayres, after having, from the year 1810, proceeded in their revolutionary movements without any obstacle from the government of Spain, had formally declared their independence in 1816; and that, after various intestine commotions and external collisions, those provinces had attained domestic tranquillity, and a good understanding with all their neighbours, and actually exercised, without opposition from within, or the fear of annoyance from without, all the attributes of sovereignty,—resolved that they ought to be recognised as an independent nation; and a minister plenipotentiary was, therefore, appointed to Buenos Ayres (1824). In 1825, a treaty of peace, commerce and navigation was concluded with Great Britain. At this time the republic assumed the title of United Provinces of La Plata. The principal functions of government were discharged for several years by a constituent congress, the executive power being intrusted to the provincial government of Buenos Ayres. In February, 1826, Rivadavia was chosen president of the United Provinces. In December preceding, the emperor of Brazil had declared war against the Argentine republic, in consequence of its having taken possession of the Banda Oriental. Garcia, who was sent by Rivadavia to negotiate a peace, having ceded the Banda Oriental to the emperor, the president was induced, by the general dissatisfaction with this step, to resign. The successes of the Argentine arms led to articles of agreement with Brazil (August, 1828), by which it was stipulated that the Brazilians should evacuate the disputed province, which was declared an independent state. (See *Monte Video.*) On the resignation of Rivadavia, congress dissolved, each of the provinces again became independent, and colonel Dorrego was chosen governor of the province of Buenos Ayres. The new governor was expelled from the city in December of the same year, by general Lavalle, the head of the Unitarios, who caused himself to be proclaimed governor, and, having made Dorrego prisoner, caused him to be shot on the spot. A civil war of the most bloody description ensued, and, in August, 1829, general Lavalle found himself compelled to resign. He was succeeded by general Viamont, who was at the head of the federal party, who, in turn, gave way to general Rosas in December of the same year.—See Funes, *Historia civil del Paraguay, Buenos Ayres y Tucuman* (Buenos Ayres, 1825); Nunes, *Historical, political and statistical Account of the United Provinces of La Plata* (translated from the Spanish, London, 1825); Head's *Journey across the Pampas*; Miers, *Travels in Chile and La Plata* (2 vols., London, 1826); Haigh's *Sketches in Peru, Chile and Buenos Ayres* (London, 1831); Miller's *Memoirs* (2 vols., London, 1828); the *American Annual Register* (I. II. III. IV.).

PLATÆÆ; a town in Bœotia, celebrated for the battle in which the Persians, under Mardonius, were defeated by the Greeks, B. C. 479. After Xerxes had been defeated at Salamis he returned with the greatest part of his forces, but left 300,000 men, under Mardonius, in Thessaly, to influence the negotiations of that commander with the Greeks. On the failure of his attempts to negotiate, Mardonius advanced towards Attica, and laid waste every thing with fire and sword. One hundred thousand Greeks, under Pausanias and Aristides, having solemnly sworn to prefer death to subjugation, advanced against the Persians, and the two armies met near the small town of Platææ, September 25. The loss of the Greeks was inconsiderable. Mardonius fell, and hardly one tenth part of his army escaped by flight; but few ever returned to their country. On the same day, the remnant of the Persian fleet, which had escaped from Salamis, was destroyed off Mycale by the Greeks, under the Athenian Xanthippus and the Spartan Leotychides. From that time, Greece was freed from invasions from Persia. The Platæans distinguished themselves both at Marathon and Platææ.

PLATE GLASS. See *Glass.*

PLATINA is a metal of modern discovery, and owes its name to the idea at first entertained of its being related to silver, it being a diminutive of the Spanish word *plata*. We shall first describe its ore, denominated in mineralogy *native platina*. It occurs in very small, irregularly formed grains, of uneven surface, usually flattened, and having the appearance of being worn by attrition. They are destitute of cleavage, and possessed of a hackly fracture; lustre metallic; colour perfect steel-gray; streak unchanged and shining; ductile; hardness a little above that of fluor; specific gravity 17.3. It generally contains a little iron, and is accompanied, besides, by iridium, osmium, rhodium, palladium, and also by copper, chrome and titanium. It is very refractory, and soluble only in nitro-muriatic acid. The pieces in which it occurs rarely exceed a few grains in weight. It has been found principally in secondary deposits, and was first brought from Peru, and from Choco, in New Grenada. It also occurs in Brazil and St Domingo; but of late comes, in the largest quantity, from Siberia, where it is found in the auriferous sands of Kuschwa, in the Uralian mountains. The richest beds of these sands are from two and a half to five feet in thickness, and yield from one to three pounds of metal for about 3700 pounds of sand. Native platina is also abundant on the western slope of the Uralian mountains, More recently, it has been found in a sienitic rock, along with oxide of iron and gold. The grains in which it occurred, possessed the same shape as those found in the sands. This locality is near Santa Rosa, in the province of Antioquia.

To procure the pure metal from its ore has been one of the most difficult problems in metallurgy; and all the processes formerly employed have given way to the ingenious one invented and practised, for a long time privately, by doctor Wollaston, and which he made public, through the Philosophical Transactions, in 1829. The crude platina is dissolved in nitro-muriatic acid (formed in the proportion of three pounds of muriatic acid to two of the simple aqua fortis). The acid should be allowed to digest three or four days, with a heat which ought gradually to be raised. The solution, being then poured off, should be suffered to stand until a quantity of fine pulverulent ore of iridium, suspended in the liquid, has completely subsided, and should then be mixed with a solution of muriate of ammonia (the salt being dissolved in five times its weight of water). A yellow precipitate of platina will immediately fall, which must be well washed in order to free it from the various impurities known to exist in native platina, and must ultimately be well pressed in order to remove the last remnant of the washings. It is next to be heated, with the utmost caution, in a black lead pot, with so low a heat as just to expel the whole of the muriate of ammonia, and to occasion the particles of platina to cohere as little as possible; for on this depends the ultimate ductility of the product. When turned out of the crucible, it will be found of a gray colour, and, if prepared with due precaution, lightly coherent. It now requires to be rubbed between the hands, in order to procure, by the gentlest means, as much as can possibly be so obtained of metallic powder, so fine as to pass through a fine lawn sieve. The coarser parts are then to be ground in a wooden bowl, with a wooden pestle, but on no account with any harder material, capable of burnishing the particles of platina (because burnished particles of platina will not weld); and indeed every degree of burnishing would prevent the particles from cohering in the further stages of the process. And since platina cannot be fused by the utmost heat of our furnaces, and consequently cannot be freed, like other metals, from its impurities during igneous fusion by fluxes, nor be rendered homogeneous by liquefaction, the mechanical diffusion through water should here be made to answer, as far as may be, the purposes of melting, in allowing earthy matters to come to the surface by their lightness, and in making the solvent powers of water effect, as far as possible, the purifying powers of borax and other fluxes, in removing soluble oxides. By repeated washing, shaking and decanting, the finer parts of the gray powder of platina may be obtained as pure as other metals are rendered by the various processes of metallurgy; and if now poured over, and allowed to subside in a clean basin, a uniform mud, or pulp, will be obtained, ready for the further process of casting. The mould to be used for casting the metallic powder, is a brass barrel, 6¾ inches long, turned rather taper within, with a view to facilitate the extraction of the ingot to be formed, being 1.12 inches in diameter at top, and 1.23 inches at a quarter of an inch from the bottom, and plugged at its larger extremity with a stopper of steel, that enters the barrel to the depth of a quarter of an inch. The inside of the mould being now well greased with a little lard, and the stopper being fitted tight into the barrel by surrounding it with blotting paper (for the paper facilitates the extraction of the stopper, and allows the escape of water during compression), the barrel is to be set upright in a jug of water, and is itself to be filled with that fluid. It is next to be filled quite full with the mud of platina, which, subsiding to the bottom of the water, is sure to fill the barrel without cavities, and with uniformity—a uniformity to be rendered perfect by subsequent pressure. In order, however, to guard effectually against cavities, the barrel may be weighed after filling it; and the actual weight of its contents, being thus ascertained, may be compared with that weight of platina and water which it is known, by estimate, that the barrel ought to contain. A circular piece of soft paper first, and then of woollen cloth, being laid upon the surface of the barrel, allow the water to pass during partial compression by the force of the hand with a wooden plug. A circular plate of copper is then placed upon the top, and thus sufficient consistency is given to the contents to allow of the barrel being laid horizontally in a forcing press. After compression, which is to be carried to the utmost limits, the stopper at the extremity being taken out, the cake of platina will easily be removed, owing to the conical form of the barrel; and, being now so hard and firm that it may be handled without danger of breaking, it is to be placed upon a charcoal fire, and there heated to redness, in order to drive off moisture, burn off grease, and give to it a firmer degree of cohesion. The cake is next to be heated in a wind-furnace; and, for this purpose, it is to be raised upon an earthen stand, about two and a half inches above the grate of the furnace, the stand being strewn over with a layer of clean quartzose sand, on which the cake is to be placed, standing upright on one of its ends. It is then to be covered with an inverted cylindrical pot of the most refractory crucible ware, resting at its open end on the layer of sand; and care is to be taken that the sides of the pot do not touch the cake. To prevent the blistering of the platina by heat, which is the usual defect of this metal in its unmanufactured state, it is essential to expose the cake to the most intense heat that a wind-furnace can be made to receive, more intense than the platina can well be required to bear under any subsequent treatment, so that all impurities may be totally driven off. The furnace is fed with coke, and the action of the fire maintained for about twenty minutes from the time of lighting it. The cake is now to be removed from the furnace, and, being placed upright upon an anvil, is to be struck, while hot, upon the top, with a heavy hammer, so as at one beating effectually to close the metal. If in this process the cylinder should become bent, it must on no account be hammered on the side, by which treatment it would be cracked immediately, but must be straightened by blows given upon the extremities, dexterously directed, so as to reduce to a straight line the parts that project. The ingot of platina, when cold, may be reduced by the processes of heating and forging, like any other metal, to any form that may be required. After forging, the ingot is to be cleaned from the ferruginous scales which its surface is apt to contract in the fire, by smearing over its surface with a moistened mixture of equal parts, by measure, of crystallized borax and common salt of tartar, which, when in fusion, is a ready solvent of such impurities, while it does not act, like caustic alkali, upon the platina itself. It is then to be exposed upon a platina tray, under an inverted pot, to the heat of a wind-furnace. The ingot may then be flattened into leaf, drawn into wire, or submitted to any of the processes of which the most ductile metals are capable. The mean specific gravity of the metallic cake of platina powder, when taken from the press, is 10; that of the cake fully contracted by heat, before forging, is from 17 to 17.7; that after forging is about 21.25, and that of wire, 21.5, being the maximum density of the metal.

Pure platina has a white colour, very much like that of silver, but is inferior in lustre to that metal. Its malleability is far less than that of gold or silver, but superior to that of tin. It may be drawn into wires that do not exceed the 2000th part of an inch. It is a soft metal, and, like iron, admits of being welded at a high temperature. A wire one tenth of an inch supports 590 pounds without breaking. As a conductor of heat, it ranks between gold and silver. It undergoes no change from the combined agency of air and moisture, and it may be exposed to the strongest heat of a smith's forge without suffering either oxidation or fusion. On heating a small wire of it, by means of galvanism, or the compound blow-pipe, it is fused, and afterwards burns with the emission of sparks. Platina is not attacked by any of the pure acids. Its only solvents are chlorine and nitro-muriatic acid, which act upon it with greater difficulty than on gold. The resulting orange-red coloured liquid, from which the excess of acid should be expelled by cautious evaporation, may be regarded as containing either chloride of platinum, or the muriate of its oxide. According to Berzelius, there are two *oxides* of this metal, the oxygen of which is in the ratio of 1 to 2. The *protoxide* prepared by the action of potash on protochloride of platina is of a black colour, and is reduced by a red heat. The *peroxide* is obtained with difficulty; for, on attempting to precipitate it from the muriate, by means of an alkali, it either falls as a sub-salt, or is held altogether in solution. It is of a yellowish-brown colour, resembling rust of iron when dry, and is nearly black when anhydrous. Like peroxide of gold, it is a very feeble base, and is much disposed to unite with alkalies.

Chlorides of platina. The *perchloride* is procured by evaporating muriate of platina to dryness, by means of a gentle heat. It is deliquescent, and a soluble in water, alcohol, and ether. The muriate of platina is the *protochloride*, and is resolved, on heating, into platina and chlorine. According to Mr E. Davy, there are two *phosphurets* and three *sulphurets* of platina. The salts of platina have the following general characters; their solution in water is yellowish-brown; sulphureted hydrogen throws down the metal in a black powder; hydriodic acid produces a thin film of platina upon the surface of the solution, after a few hours' standing. The *sulphate* of platina is formed by the action of nitric acid upon the sulphuret, or hydro-sulphuret. It is soluble in water, alcohol, and ether. When a strong aqueous solution of it is mingled with alcohol, in equal volumes, and heated, it will deposit a black powder, which, on being washed and dried, and heated to the temperature of 400°, explodes with violence. This detonating compound is analogous to those which ammonia forms with the oxides of gold and silver.

The useful *alloys* of platina are not numerous. With silver it forms a tolerably fusible white alloy, malleable and brilliant when polished; but it scales and blackens by working. Gold, by a forge heat, combines with platina, and the alloys, in all proportions, are more fusible than platina. In the proportion of 38 grs. to 1 oz., it forms a yellowish-white, ductile, hard alloy; it is so elastic after hammering, that it has been proposed to use it for watch-springs. Mercury, by trituration with spongy platina, forms an amalgam at first soft, but which soon becomes considerably firm, and has been much used in obtaining malleable platina. A coating of platina can be given to copper and other metals, by applying to them an amalgam of spongy platina, and five parts of mercury; the latter metal is then volatilized by heat. Lead combines with platina readily; and iron and copper in like manner: the last mentioned, when added in the proportion of 7 to 16 of platina and 1 of zinc, and fused in a crucible, under charcoal powder, forms the alloy called *artificial gold*. Steel unites with platina in all proportions, and, especially in the proportion of from 1 to 3 per cent. of platina, forms a tough and tenacious alloy, well adapted for cutting instruments. Arsenic unites easily with platina, and was once employed for rendering the latter metal fusible. Platina is a metal of great utility. It is used for the construction of large boilers for the concentration of sulphuric acid, the larger ones of which cost upwards of 300 guineas. Its uses in chemistry are numerous, and very important. It is also employed for staining pottery; and has lately been coined in Russia, and forms a part of the circulating medium of that country.

PLATO (from πλατυς, broad). The celebrated Greek philosopher of this name was so called on account of the breadth of his chest and forehead. His original name was *Aristocles*. He was the son of Ariston and Perictione, and was born about 429 B. C. Among his ancestors were king Codrus and the lawgiver Solon. Circumstances were favourable to his early education; his body and mind were equally developed. In gymnastics, he was instructed by Ariston, in the rudiments of letters by the grammarian Dionysius, in painting and music by Draco and Metellus, in philosophy at first by Cratylus. Until his twentieth year, the gifted youth tried his creative power in epic, lyric, and dramatic poetry with much ardour. Nothing satisfied him. We now see him introduced by his father to the wise Socrates, who, the story says, was just relating to his pupils a dream, in which he had seen a young swan fly from the altar of Cupid into the academy, and alight in his lap, whence he soared, with an enchanting song, into the air:—"See, here, the academic swan!" he exclaims, perceiving Plato. He cultivated the mind of his new pupil for eight years, and the acute and profound views of the scholar tasked his faculties, and awakened in him admiration and love. After the sage—accused of deriding the gods of his country—had drank the hemlock, Plato, thirsting for the highest knowledge which his times could afford, left Athens. He first visited Megara, where he staid for some time with Euclid (the head of the Megarean school, and formerly also the disciple of Socrates); exchanging opinions, and calling to mind the lessons of their teacher. He then visited Magna Græcia, where he held intercourse with the Pythagoreans; Cyrene, a Greek colony in Africa, where he became acquainted with Theodorus; also Egypt, the land of ancient wisdom, and was prevented only by the breaking out of a war from visiting Syria and Persia. At the age of about forty years, he returned, and arrived at Syracuse, then ruled by the tyrant Dionysius. He formed a friendship with Dion, a relative, indeed, of Dionysius, but hostile to the effeminate luxury of his countrymen, and inspired with a noble zeal for the improvement of his country. Dion introduced him to the tyrant, to try whether intercourse with his friend might not dispose the ruler more favourably towards liberty. But Plato's philosophic and independent spirit offended the tyrant, who became suspicious of him, and, when Plato embarked, in consequence of the representations of Dion and Aristomenes, he bribed the latter to kill or sell him. Aristomenes did the latter, but Anniceris ransomed him; and Plato at last returned to Athens, where, about the 99th Olympiad, he taught philosophy in the academy—a gymnasium situated in the suburbs. In the second year of the 103d Olympiad (368 B. C.), Dionysius I. died, and Dionysius II. succeeded him. Dion now entertained new hopes, and Dionysius, who was desirous of having learned men at his court, joined him in an invitation to Plato to visit Syracuse again. The philosopher was fully conscious of the danger and probable failure of his visit; but the hope of being useful made him once more resolve to leave the shores of Attica. Speusippus accompanied him. The beginning promised well: his entrance into Syracuse was solemnly celebrated. He instructed the prince in mathematics: but he soon became again the object of jealousy and intrigue. Philistius, the historian, who had been banished under the late reign, was recalled, in order, as was pretended, to support the tottering throne. He fanned the suspicions of the tyrant against Dion, and hardly had three months elapsed from the time of Plato's arrival in Sicily, when his friend was carried to the coast of Italy. Plato was obliged, by repeated and urgent invitations, to take up his residence in the royal palace, where he was closely observed; and if it had not been for the breaking out of a war, his request for dismission would probably not have been complied with. It was granted at length, but on condition that he should return after the conclusion of peace. He now went back to Athens, where he tried to console Dion. Peace was concluded, and Plato was reminded of his promise. He, however, resisted all the flattering assurances which were made him for some time. At last Dionysius sent a vessel bearing letters and personal friends of Plato to prevail on him to repair to Syracuse. He yielded at last with the hope of doing something for his friend Dion. But his situation became worse than it had been on his previous visit. Dion's income was kept back, and Plato's life was even endangered. Archytas, however, persuaded the tyrant that a political measure required the return of Plato; he was allowed to depart, and even his travelling expenses were paid.

He landed in Elis, where he found Dion, who formed a plan for punishing the tyrant; but Plato was unwilling to accede to it. It cannot surprise us that a man of so elevated a character was calumniated, and accused of avarice, intemperance, vanity, and even flagitious crimes. These charges are refuted by the high esteem in which Plato was held, by his life and actions. He died in the first year of the 108th Olympiad (348 B. C.), on his eighty-second birth-day, a hale old man, breathing out his life in soft slumber among friends, at a wedding banquet. An inscription in the Ceramicus, where he was buried, proclaimed his merit, and the love of his contemporaries.

In order to understand the whole of Plato's philosophy, and seize its true spirit, it is necessary to acquaint one's self with the gradual unfolding of the Greek philosophy, and the different modes in which it was cultivated in the various schools, and, at the same time, to be acquainted with the spirit of Oriental metaphysics. The conceptions of a mind like Plato's, inspired with the most lofty and glowing desire to show the connexion of the human soul with the original fountain of light and perfection, and its aspirations for a reunion with it (which can be expressed only in feeble comparisons and imperfect images); of a mind to which the greatest earthly good appeared to be the union of kindred souls in the love and zealous search for truth (the Platonic love); of a mind which conceived the human soul to contain, in its present state of lost perfection, all the germs of regeneration and restoration to the kingdom of truth—the works of such a lofty, pure and gifted spirit require to be studied with peculiar attention, and with a spirit superior to the temptation to ridicule images and comparisons that attempt to convey thoughts for which language is insufficient, and which remind us of St Augustine's expression, that we are placed too high for our own understanding. We must expect, indeed, to meet some strange mistakes, when a spirit like Plato's enters into the details of particular subjects, as, for instance, in his Republic; but this very treatise affords most insight into the mind of the philosopher, although it discloses but a part of his whole system or doctrine. Of such a system of philosophy, however, it would be impossible, within our limits, to give a view that would convey any satisfactory idea. No scholar of late has done so much for the just appreciation of this great mind as professor Schleiermacher, by his arrangement of the various writings of Plato, accompanied by profound and learned commentaries, and by a translation of them into German. Professor Schleiermacher first arranged the dialogues according to the connexion of their subjects, and thus formed three groups: 1. the elementary dialogues, in which are contained the first indications of that which is the foundation of all the following: of dialectics, as the technical part of philosophy, of ideas, as the proper subject of it, therefore of the possibility and the conditions of knowledge, in which, however, the theoretical is separated from the practical. In this class he places the Phædrus, Lysis, Protagoras, Laches, Charmides, Eutyphron, Parmenides, likewise the apology of Socrates, Criton, Ion, the Lesser Hippias, Hipparchus, Minos, Alcibiades II. 2. Those dialogues which treat of the application of these principles, of the difference between philosophical and common knowledge in their application to the two great sciences, ethics and physics. These are the Gorgias, Theætetos, Menon, Euthydemus, Cratylus, the Sophist, the Politician, the Banquet, Phædon, Philebus, &c. 3. Those in which the theoretical and practical become one and the same. These are Timæus, Critias, the Republic, the Laws, Epinomis. In addition to Schleiermacher, we would mention Tiedemann's *Dialog. Plat. Argumenta exposita et illustrata* (Bipont, 1786), and Tennemann's System of the Platonic Philosophy (Leipsic, 1792—95, 4 vols.); further, Heusde's *Initia Philosophiæ Platonicæ* (Utrecht, 1827).

The effect which a mind so vast was calculated to produce was very great. The school of Plato was called the *academy*, and has been generally divided into the old, middle and new. Among the philosophers of the first division are Speusippus, Xenocrates, Polemo, Crates, Crantor, the immediate followers of Plato. The founder of the middle academy is Arcesilaus, whose successors were Lacydes, Evander, Hegesinus and Carneades, the last of whom was the founder of the new academy: his successor was Clitomachus. His pupils, Philo and Charmides, again deviated from the doctrines of the new academy, and approached more to those of Plato himself. Some others adopt a fourth division, whose founder was Philo, who again took the dogmatic direction. Cicero (*Qu. Acad.* i. 43, et seq) only adopts the division of old and new. Aristotle, Plato's pupil for many years, became the founder of the peripatetic school. (See that article, and *Aristotle*.) The difference between these great men is striking: Goethe calls Aristotle "a man of an architectural genius, who seeks for a solid basis for his building, but looks no farther, who describes an immense circuit for its foundations, collects materials from all sides, arranges them, lays one above the other, and thus ascends in regular form pyramidally, while Plato, like an obelisk, nay, a flame, seeks the heavens." Aristotle was critical, scrutinizing whatever came within the range of his comprehensive mind, while Plato brings every thing into connexion with his elevated view of the human soul; and we may be allowed to mention the beautiful conception of the difference of these powerful minds, in Raphael's School of Athens—one of the grandest pictures ever produced, of which they form the two chief personages—Aristotle, with a look of deep reflection, and eyes directed forward, while Plato lifts up his right arm, as if testifying of the worlds above, like a prophet. Plato was considered, when Christianity began to spread, as the firmest prop of heathenism; but the followers of the new faith attempted to reconcile his doctrines with the Christian. The chief supporters of his doctrine at this time were the *New Platonists* (q. v.), also called *Alexandrian philosophers*, and *eclectics*. Aristotle had the decided predominance until the fourteenth century, when Platonism revived, and the greatest struggles ensued between the Platonists and the Aristotelians. Gemesthius Pletho inspired Cosmo de' Medici with a love for Plato, so that the duke established a Platonic academy, took the son of his physician, the translator of Plato, Marsilius Ficinus, into his house, and gave him a villa near to his own of Careggi. The best editions of Plato are, besides the Aldine, that of Henry Stephens (1578, 3 vols., folio; the Frankfort edition, 1602, folio, and the Bipont edition, 1781—86, 13 vols.) The latest are by Bekker, Stallbaum and Ast. Pr. Cousin has translated Plato's Works into French—*Œuvres complètes de Platon* (Paris, 1827, 7 vols.)

PLATOFF, or PLATOW, hetman of the Cossacks, was born in the southern part of Russia, about 1763. He entered young into the military service, and in 1806 and 1807, he had the rank of lieutenant-general in the Russian army sent to the assistance of Prussia. He was afterwards employed against the Turks in Moldavia, and was made a general of cavalry. When the French invaded Russia, in 1812, Platoff was again called into actual service, and, though he was defeated at Grodno, and obliged to retire into the interior, he returned during the retreat of the enemy from Moscow, and, with twenty regiments of Cossacks, he harassed them in their flight, and contributed greatly to the advantages gained over them. In 1813, after the battle of Leipsic, he entered France, and was at Paris with the emperor Alexander, whom he accompanied to England. At London, he was the object of popular admiration, and a magnificent sabre was presented to him. In 1815, he commanded the Cossacks destined for the second invasion of France, and again made his appearance at Paris. After the restoration of peace, he retired to Tcherkash, on the river Don, where he died in February, 1818.

PLATONIC LOVE. See *Plato.*

PLATTE, OR LA PLATTE RIVER, in Missouri Territory, rises in the Rocky mountains, and flows east into the Missouri. It is of great length, and is 600 yards wide at its mouth.

PLATYPUS (*ornithoryncus*). This extraordinary animal, which is peculiar to New Holland, almost appears to be a link between the aquatic birds and the mammalia. It is about a foot long, having a flattened body like that of the otter, covered with a thick soft fur, moderately dark brown above, and whitish beneath. The muzzle is elongated, enlarged and flattened, resembling the beak of a duck, like which its edges are armed with transversal plates. The teeth are situate in the back part of the mouth, two on each side, with flat tops and no roots. The feet are furnished with a membrane uniting the toes, and in the anterior feet extending beyond the nails. The tail is flat and obtuse. From the form of this animal it is fitted to reside in the water, and it must feed on soft food, as the structure of the beak will not enable it to grasp any thing firmly. From the accounts of travellers, it seems probable that these animals produce eggs; if so, their alliance to birds becomes still greater; this fact, however, is not substantiated. The platypus is armed with a spur on each hind leg, having a canal in it similar to that in the poison-fang of venomous serpents, and, like this, also, furnished with a gland at base, secreting a fluid; hence it is likely that wounds produced by them would be dangerous. They have no external ear, and their eyes are very small. There is a genus closely resembling the platypus, also peculiar to New Holland, viz. *echidna*, or *spinous ant eater*, which, however, is not amphibious. See Memoirs on the anatomy of this animal, by Sir E. Home, Meckel, Cuvier, St Hilaire, &c.

PLAUTUS, MARCUS ACCIUS, one of the oldest Roman comic writers, was born at Sarsina, in Umbria, and flourished, about B. C. 200, as the manager of a company of players in Rome. Aulus Gelius tells us that, for some time, he was in a very destitute condition, and was compelled to earn his livelihood by turning a mill. He must have possessed an inexhaustible fund of gayety, since, even in a condition so unfavourable to poetry, he seems to have composed some comedies. About twenty of them, principally entire, have come down to us. The names are either borrowed from the persons of the piece, as Amphitryon (the husband of Alcmena, mother of Hercules), Curculio (Corn-Worm, the name of a sponger), Epidicus, Pseudolus, Stichus (names of slaves), Bacchides (name of two frail fair ones), Menaechmi (the name of a pair of twins), Miles Gloriosus (the Braggart Soldier), Captivi (the Two Captives), Mercator (the Merchant), Pœnulus (the Carthaginian), Persa (the Persian), Truculentus (the Fierce), or from something which serves as a foundation of the play, as Aulularia, Cistellaria, Mostellaria, sc. Fabula (the Pot or the Treasure, the Casket, the Ghost.) Plautus's merit consists in having introduced into the Latin language the plays of Diphilus, Epicharmus and others, by translations or imitations, and by this means contributed to improve and enrich it. The ancients praise his pithy, antique language; and, according to Varro, the Muses, if they had spoken Latin, would have used the language of Plautus. The wit and sententiousness of the old comedian were no less admired. Much may be learned from Plautus of the language of conversation and common life, although much of it is obsolete and not to be imitated. Much, too, is vulgar, the jests often low, and sometimes obscene. The subject of his pieces is frequently an obscene story, humorously treated. In general, his dialogue has more merit than his plots and dramatic action. An excellent edition of the comedies of Plautus was issued by Ernesti (Leipsic, 1760, 2 vols.). A later edition, with a running commentary, appeared at Bipont in 1788 (3 vols.); another by Schmieder (Gottingen, 1804 to 1805, 2 vols.); and the latest by Bothe (Berlin, from 1809 to 1811), in four volumes. There is an English translation, by Thornton, in five volumes (1769).

PLAYFAIR, JOHN; a distinguished natural philosopher and mathematician, was born at Bervie, near Dundee, in Scotland, in 1748. His father was a parochial clergyman of the Scottish church. Having finished his education at the university of St Andrew's, he received ordination, and succeeded to his father's benefice in 1772. After holding it some years, he resigned it, and, going to Edinburgh, obtained the mathematical chair in that university. In 1778, he published, in the Philosophical Transactions, a paper On the Arithmetic of Impossible Quantities; and on the establishment of the royal society of Edinburgh, he was appointed one of the secretaries. To the first volume of its Transactions he contributed an Account of the Life and Writings of Matthew Stewart, Professor of Mathematics at Edinburgh, and an essay On the Causes which affect the Accuracy of Barometrical Measurements; and several other communications from him appeared in the subsequent volumes. Professor Playfair devoted much time to the study of geology; and, in 1816, visited the Alps, for the purpose of making geological observations on the structure of those mountains. He adopted the opinions of doctor James Hutton, which he defended in his Illustrations of the Huttonian Theory of the Earth (4to). His death took place at Edinburgh, July 19, 1819. Besides the productions already noticed, he was the author of Elements of Geometry (8vo); Outlines of Natural Philosophy, (2 vols. 8vo); and of a dissertation on the Progress of the Mathematical and Physical Sciences since the Revival of Letters (first published in the Supplement to the Encyclopedia Britannica, reprinted separately in Boston, 1 vol., 8vo). His works, collected in four volumes, with a memoir prefixed, appeared in Edinburgh in 1822. Professor Playfair's literary and domestic character has been admirably drawn by Lord Jeffrey. His brother, WILLIAM PLAYFAIR, was an ingenious mechanic and miscellaneous writer, chiefly on the passing politics of the day. He died at London, in 1823, aged sixty-four.

PLEBEIANS (*plebs,*) among the Romans; the people, or that class of citizens which did not belong to the senators (see *Patricians*) or knights (see *Equestrian Order*); in the later ages of the republic, all those who had no public station, but lived as private individuals on their own resources, and, in general, all whose fortunes did not amount to at least 400,000 sesterces; they were mechanics, merchants, soldiers, &c. The poorer classes in particular, who lived principally by the largesses made by the state, or the rich, or by their patrons, and by the sale of their votes (which was forbidden by law), were called *plebeians*. A distinction was made between the *plebs rustica* and the *plebs urbana;* the latter comprising the industrious classes, the mechanics and shopkeepers, as well as the numerous idlers and paupers, &c., living in the city; the former, the citizens residing in the country, who lived by agriculture, and were the most respectable. (For an account of the struggles of the patricians and plebeians, see *Rome.*) In the most flourishing period of the republic, after the death of Sylla, the number of Roman citizens was about 400,000, nearly half of whom lived in Rome and its vicinity, and formed, after deducting the senators and knights, the third estate.

PLEBIS-SCITA. See *Civil Law.*

PLEDGE, or PAWN, is a species of bailment, being the deposit or placing of goods as security for the payment of money borrowed, or the fulfilment of an obligation or promise. It is distinguished from a mortgage of chattels, by the circumstance that the legal property in the chattel mortgaged is in the mortgagee, whereas the legal ownership of goods pawned remains in the pawner, though according to the definition of a pawn and pledge, the pawnee not only has the right of possession, but must be in possession. If the money is not paid at the time stipulated, the pawn may be sold by the pawnee, who may retain enough of the proceeds to pay the debt intended to be secured. In some cases the terms of the deposit are the forfeiture of the pawn in case the pawner does not fulfil the promise or obligation to guarantee which the pawn is given.

PLEIADES; the seven daughters of Atlas, who, being pursued by Orion, were changed, by Jupiter, into doves. They were translated to the heavens, and form the assemblage of the Seven Stars in the neck of Taurus, called by the Latins *Vergiliæ*. There are, however, only six stars visible in Pleiades,—a fact noticed by Ovid. The *Poetical Pleiades* is a name given by the Greeks to seven celebrated poets of the time of Ptolemy Philadelphus. (See *Alexandrian School.*) A French Pleiades was formed in imitation of it, in the reign of Henry II.; it consisted of Ronsard, du Belloy, Jodelle, &c.

PLEONASM (from *πλεονασμος*, a redundancy), in rhetoric, is a figure of speech by which we use more words than seem absolutely necessary to convey our meaning, in order to express a thought with more grace or greater energy; it is sometimes also applied to a needless superabundance of words.

PLESIOSAURUS. See *Organic Remains.*

PLESSIS is found in a number of French geographical names, and is derived from the Low Latin *plexitium*, signifying a *hedge, fence.*

PLEURISY (*pleuritis*); an inflammation of the pleura, or membrane which lines the internal surface of the cavity of the breast, and covers the external surface of the lungs. The pleurisy is generally caused by colds, rheumatism, bleeding, &c. It comes on with an acute pain in the side, and is accompanied by a difficulty of breathing, attended with pain, by coughing, and feverish symptoms. At first the cough is dry, but is afterwards commonly attended with expectoration. The inflammation then disappears, but is sometimes succeeded by suppuration, and the lungs sometimes become attached to the walls of the breast. The disease is not dangerous if the patient has not been previously attacked by it, nor in its first stages, nor if it is properly attended to in season. The application of leeches and other less antiphlogistic remedies, and blistering, are recommended.

PLICA POLONICA. The *Weichselzopf,* or *plica Polonica,* derives its name from its most prominent symptom—the entangling of the hair into a confused mass. It is generally preceded by violent headaches, and tingling in the ears; it attacks the bones and joints, and even the nails of the toes and fingers, which split longitudinally. If so obstinate as to defy treatment, it ends in blindness, deafness, or in the most melancholy distortions of the limbs, and sometimes in all these miseries together. The most extraordinary part of the disease, however, is its action on the hair. The individual hairs begin to swell at the root, and to exude a fat, slimy substance, frequently mixed with suppurated matter, which is the most noisome feature of the malady. Their growth is, at the same time, more rapid, and their sensibility greater than in their healthy state; and, notwithstanding the incredulity with which it was long received, it is now no longer doubtful, that, where the disease has reached a high degree of malignity, not only whole masses of the hair, but even single hairs, will bleed if cut off, and that, too, throughout their whole length, as well as at the root. The hairs, growing rapidly amidst this corrupted moisture, twist themselves together inextricably, and at last are plaited into a confused, clotted, disgusting-looking mass. Very frequently they twist themselves into a number of separate masses, like ropes; and there is an instance of such a *zopf* growing to the length of fourteen feet on a lady's head, before it could be safely cut off. Sometimes it assumes other forms, which medical writers have distinguished by specific names, as the *bird's nest plica,* the *turban plica,* the *Medusa head plica,* the *long-tailed plica,* the *club-shaped plica,* &c. The hair, however, while thus suffering itself, seems to do so merely from contributing to the cure of the disease, by being the channel through which the corrupted matter is carried off from the body. From the moment that the hair begins to entangle itself, the preceding symptoms always diminish, and frequently disappear entirely, and the patient is comparatively well, except that he must submit to the inconvenience of bearing about with him this disgusting head-piece. Accordingly, where there is reason to suspect that a *Weichselzopf* is forming itself, medical means are commonly used to further its outbreaking on the head, as the natural progress and only true cure of the disease; and, among the peasants, the same object is pursued by increased filth and carelessness, and even by soaking the hair with oil or rancid butter. After the hair has continued to grow thus tangled and noisome for a period which is in no case fixed, it gradually becomes dry; healthy hairs begin to grow up under the plica, and at last "push it from its stool." In the process of separation, however, it unites itself so readily with the new hairs, that, if not cut off at this stage, it continues hanging for years, an entirely foreign appendage to the head. There are many instances of Poles, who, suffering under poignant ailments, which were, in reality, the forerunners of an approaching *Weichselzopf,* have in vain sought aid in other countries from foreign physicians, and, on their return, have found a speedy, though a very disagreeable cure, in the breaking out of the plica. But till the plica has run through all its stages, and has begun of itself to decay, any attempt to cut the hair is attended with the utmost danger to the life of the patient; it not only affects the body by bringing on convulsions, cramps, distortion of the limbs, and frequently death, but the imprudence has often had madness for its result; and, in fact, during the whole progress of the disease, the mind is, in general, affected no less than the body. Yet, for a long time, to cut off the hair was the first step taken on the approach of the disease. People were naturally anxious to get rid of its most disgusting symptom, and they ascribed the melancholy effects that uniformly followed, not to the removal of the hair, but merely to the internal malady, on which this removal had no influence; and medical men had not yet learned that this was the natural outlet of the disease. Even towards the end of the last century, some medical writers of Germany still maintained that the hair should instantly be cut; but the examples in which blindness, distortion, death, or insanity, has been the immediate consequence of the operation, are much too numerous to allow their theoretical opinion any weight. The only known cure is to allow the hair to grow till it begins to rise pure and healthy from the skin, an appearance which indicates that the malady is over; it is then shaved off, and the cure is generally complete, although there are cases in which the disease has been known to return. The length of time during which the head continues in this state of corruption, depends entirely on the degree of malignity in the disease.

The *Weichselzopf*, at once a painful, a dangerous, and a disgusting disease, is not confined to the human species; it attacks horses, particularly in the hairs of the mane, dogs, oxen, and even wolves and foxes. Although more common among the poorer classes, it is not peculiar to them, for it spares neither rank, nor age, nor sex. Women, however, are said to be less exposed to it than men, and fair hair less than brown or black hair. It is contagious, and, moreover, may become hereditary. Among professional persons, great diversity of opinion prevails regarding its origin and nature. According to some, it is merely the result of filth and bad diet; but, although it certainly is more frequent among the classes who are exposed to these miseries, particularly among the Jews, whose beards it sometimes attacks as well as their locks, it is by no means confined to them; the most wealthy and cleanly are not exempt from its influence. Others again, allowing that it is much aggravated by uncleanliness and insalubrious food, set it down as epidemic, and seek its origin in some particular qualities of the air or water of the country, just as some have sought the origin of *goitres;* but, though more common in Poland than elsewhere, it is likewise at home in Livonia, and some other parts of Russia, and, above all, in Tartary, from whence, in fact, it is supposed to have been first imported during the Tartar invasion, in the end of the thirteenth century. A third party has made it a modification of leprosy. The more ignorant classes of the people believe that it is a preservative against all other diseases, and therefore adorn themselves with an inoculated *Weichselzopf*. See Russell's *Tour in Germany*.

PLINTH. See *Architecture*.

PLINY (CAIUS PLINIUS SECUNDUS), the elder, a Roman knight, was born at Verona, A. D. 22. He was one of the greatest scholars of Rome. He devoted himself to jurisprudence, but made a campaign into Germany, and afterwards filled many public offices, among them the office of a procurator in Spain. His uncommon spirit of inquiry was aided by an unwearied industry. Every moment that was not employed in the business of his office, he appropriated to his studies. He was a very early riser, even in winter; very often did not retire to bed at all, and used to read while at meals, and in the bath, or had some one to read to him. He diligently noted down every thing of importance; and often said, that no book was so bad, but that something might be learned from it. If he was not able to write himself, he dictated. In this way, Pliny, notwithstanding his many public affairs, wrote many important works, which give proof of his very extensive learning. He finally became a victim to his curiosity. Being one day in the neighbourhood of Vesuvius, a terrible eruption of this volcano (A. D. 79) induced him to approach for the purpose of viewing it closely, notwithstanding the danger to which he was exposed. The hot ashes even fell upon his vessel; still he continued to take note of every thing he saw. While the earth around him threatened, he passed the night quietly with a friend not far from the mountain, and the next morning, on the sea-shore, he perished by a suffocating vapour which spread over the whole country. The writings of this diligent and active man are principally lost; among them the work on the war in Germany, and his Universal History. The *Historia Naturalis*, or *Historia Mundi*, in thirty-seven books, is extant; it is a rich collection of facts of every kind, from the whole circle of nature and science, and also from the history of art, which is the more valuable, as Pliny drew from many lost books. Of the old critical editions, that of Hardouin (Paris, 1723), is the best.

PLINY (CAIUS PLINIUS CÆCILIUS SECUNDUS), the younger, a nephew of the former, was born A. D. 62, at Comum (Como). Having been adopted by his uncle, he learned to make a wise use of time, applied himself early, with the greatest assiduity, to the study of eloquence and philosophy, and, when a boy of thirteen years of age, made an attempt to write a tragedy in the Greek language. In Syria, where he was the commander of a legion, he enjoyed the society of the philosopher Euphrates, and afterwards made his appearance in Rome as an advocate with success, filled several public offices, and was consul in his thirty-ninth year. By the favour of the emperor Trajan, he was appointed augur and governor of Pontus, in Bithynia, which office he administered for two years, to the general satisfaction. He was one of the most distinguished, and best, and, we may also add, one of the most fortunate men of his age. He had most of the requisites for the enjoyment of life,—a cultivated mind, a generous heart, friendship and love. As an author he laboured with ardour. He attempted several departments of literature, both in prose and poetry. Of his writings, only a collection of letters, in ten books, and a panegyric on Trajan, remain. The letters are addressed to different friends, some of them to the emperor, and are on various subjects. Their elegance and intellectual tone make them attractive, and very instructive. In his Panegyric on Trajan, he is, as some think, extravagant in his praise, and in his rhetorical ornaments. It is not, indeed, to be recommended as a model, yet it is an important work for the history of the noble emperor and his time. The Letters and the Panegyric were edited together, with notes, by Gesner (Leipsic, 1739); Ernesti (Leipsic, 1770), and others. A later critical edition of the Letters, with notes, was edited by Gierig (Leipsic, 1800), and the complete works of Pliny, by the same (Leipsic, 1806); afterwards by G. H. Schafer (Leipsic, 1815); and by Titze (at Prague, in 1820). The Panegyric was edited by Gierig, with notes (Leipsic, 1796), who also published a work On the Life, Moral Character, and Literary Reputation of the Younger Pliny. The Epistles of Pliny have been translated into English by lord Orrery and Mr Melmoth.

PLOTINUS, the most distinguished among the New Platonists, was born at Lycopolis, in Egypt, A. D. 205, is said to have studied philosophy at Alexandria, under Ammonius, travelled, at the age of thirty-nine into the East, to learn the doctrines of the Magi, and in his fortieth year, became a teacher of philosophy in Rome. His writings and instructions excited the most enthusiastic admiration among his disciples. He died A. D. 270, in Campania, his death having been hastened by his austerities. His pupil Porphyry wrote his Life, and arranged his writings. Marsilius Ficinus first edited and translated them. Creuzer has published his Dissertation on Beauty (Heidelberg, 1814), and Engelhardt has translated his Enneades into German, with a commentary (Erlangen, 1820—1823.) See *New Platonists*.

PLOUGH MONDAY; the next Monday after Twelfth Day. On Plough Monday, the ploughmen in the northern part of England used to draw a plough from door to door, and beg money for drink.

PLOVER (*charadrius*); a genus of the *grallæ*, or waders, distinguished by having a moderate-sized compressed beak, enlarged at the end, and the hinder toe exceedingly small, not touching the ground. They inhabit all parts of the world, traversing temperate climates in the spring and autumn. They are gregarious, and are generally seen in meadows, or on the sea-shore, in search of food, which they procure by stirring the earth or mud with their feet, and thus inviting worms and aquatic insects to the surface. The female lays about four eggs in a rude nest in the sand. Their flesh is excellent, and hence they are much sought for by sportsmen. They are thus enumerated by C. Bonaparte: *C. semipalmatus* (ring plover), peculiar to America; *C. melodius* (ring plover), peculiar to America; *C. Wilsonius* (Wilson's plover), peculiar to America; *C. vociferus* (killdeer), peculiar to America; *C. pluvialis* (golden plover), inhabits throughout the world; *C. helveticus* (black-bellied plover), inhabits the north of Europe and America. The ruddy plover belongs to the genus *tringa*, and is also found in both continents.

PLUM (*prunus*); a genus of plants belonging to the *rosaceæ*, and now separated from the cherry, chiefly on account of the large oval fruit covered with a fine whitish dust, the oblong, compressed, and acute stone, and the different manner in which the young leaves are folded. About a dozen species are known, all inhabiting the north temperate regions of the globe. They are small trees or shrubs, with alternate leaves, and white flowers, either solitary, or disposed in fascicles in the axils of the ancient leaves. The common garden plum (*P. domestica*) does not seem to be a native of Europe, and probably was introduced from Syria. It is mentioned by Dioscorides and Theophrastus, and now is very generally cultivated. It is a robust tree, of middling stature, seemingly adapted to every kind of soil, though most flourishing where it is light and a little sandy. The varieties are very numerous, and differ in colour, taste, size, and form; some are not larger than cherries, while others are nearly two inches in diameter; some are oblong or ovoid, and others perfectly globular; the colour is either white, green, yellow, red, purple, blue, or blackish; the taste acid, austere, insipid, sweetish, or aromatic; the consistence of the flesh coriaceous, hard, soft, melting, dry, or watery; all, however, have a smooth skin, which is always more or less covered with a fine whitish dust, easily removed by rubbing. The most esteemed of all these varieties is the green gage, or *reine Claude*. (See *Green Gage*.) The Washington plum is similar to the green gage, but the skin is dull yellow, assuming an orange cast on the side exposed to the sun, and is more or less mottled with crimson dots; the flesh is yellow, firm, very sweet, and luscious, and separates freely from the stone. The origin of the Washington plum is remarkable, and deserves a passing notice. The parent tree was purchased in the New York market, and remained barren for several years, when it was struck by lightning, and destroyed. The root afterwards threw up a number of vigorous shoots, which were suffered to remain, and in due time produced fruit. The foliage of this tree is also among plums remarkable for its beauty. Almost all the varieties of plums may be dried and converted into prunes, but those which are most fleshy, and best retain their quality, are preferred. Prunes now form a considerable article of commerce, and are imported chiefly from France, particularly from the port of Marseilles. Plums may also be preserved in various manners, in spirits of wine or sugar, or formed into marmalade, jellies, &c. The wood of the plum tree is hard, compact, traversed with reddish veins, and susceptible of a fine polish. It is frequently employed by turners and cabinet-makers, but requires to be thoroughly dried. The sloe (*P. spinosa*) is a thorny shrub, growing wild in most parts of Europe, and bearing a small, round, and nearly black fruit, of an extremely austere taste. The juice of this plum is frequently employed to communicate a red colour and astringent flavour to wines.

PLUMBAGO, OR GRAPHITE. This valuable mineral is sometimes found in thin, irregular, six-sided tables; but more generally in scales, or compact. Lustre metallic; colour iron-black, or dark steel-gray; streak black, shining; opaque. It is ductile and flexible in thin laminæ; hardness between talc and gypsum; specific gravity 2. It consists of carbon 96, and iron 4. In a high degree of heat it is combustible, and leaves a residue of oxide of iron. It is infusible alone, and with additions. It sometimes occurs in beds in primitive rocks, particularly those of the trappean variety. When found in primitive limestone, it is disseminated in scales, after the manner of talc. It is also found in the coal formation. Its most remarkable depository is at Borrowdale, in Cumberland, (England), where it exists in a bed of trap, alternating with clay slate. The chief employment of plumbago is in manufacturing pencils and crucibles; the latter particularly for the mint. It is also used for giving a gloss to iron stoves and railings, and for diminishing the friction of machinery.

PLUMBER'S SOLDER. See *Bismuth*.

PLURALITY is used in contradistinction to *majority*, in reference to votes given in at elections. *Majority* signifies at least one more than half of all the votes given in, whilst *plurality* means only the greatest number of votes, so that if there are three or more candidates for an office, one of them may have a plurality without a majority, which latter is required in many cases by law. If none of the candidates for the presidency of the United States has a majority, the election of the president devolves upon the house of representatives of the United States, who are bound to elect one of the three candidates who had the most votes,—a case which occurred when Mr John Q. Adams was chosen. In France, majority, in this sense, is called *majorite absolue*.

Plurality of benefices signifies the holding of more benefices than one by the same clergyman (pluralist) at the same time.

PLUS, more, in mathematics, signifies addition; the sign by which it is indicated is +; thus, A + B, which is read, A plus B, denotes that the quantity A is to be added to the quantity B. *Plus*, or its sign, +, is also used to indicate a positive magnitude or relation, in opposition to *minus* (—), which indicates a negative.

PLUTARCH; a learned and prolific Greek

writer, born at Cheronæa in Bœotia, A. D. 50. According to some, Trajan was his pupil. In the reign of that emperor, he was invested with some civil offices in Rome, where he taught philosophy; and, having returned to his own country, he died there in 120 or 130. He is said to have written about 300 philosophical and historical works, of which 125 are extant, but some of these are falsely ascribed to him. The philosophical works, which commonly go under the name of *Ethica* or *Moralia*, explain the Platonic doctrines, combat the Stoic and Epicurean, and treat of various practical subjects in a popular way; they show him to have been of an active turn of mind, and contain happy applications of extensive learning. His historical writings are yet more distinguished, and are valuable, as throwing much light on ancient history, particularly his Lives (44) and Parallels of Illustrious Greeks and Romans (edited by Bryan, London, 1729, 5 vols., 4to; Leipsic, 1812—14, 9 vols., 12mo; by Coray, Paris, 1809—17, 6 vols.; translated into English by the Langhornes); his Greek and Roman Researches, Iris and Osiris, or of Egyptian Antiquities, and Apothegms. The treatise On the Doctrines of Philosophers (edited by Cassini, 1751, and by Beck, 1786), which contains valuable materials for the history of philosophy, is probably not by him. His manner of treating his subject is easy, often superficial, and this is also the character of his style, which is censured as being too much ornamented by quotations from poets and philosophers. Among the editions of his complete works, those of H. Stephens (Paris, 1572, 13 vols.); of Rualdus (Paris, 1624, 2 vols., folio); of Frankfort (1599 and 1620, 2 vols., folio); of Reiske, (Leipsic, 1774—82, 12 vols.), and of Hutten (Tubingen, 1791—1805, 14 vols.), are the best. Amyot's French translation of the Lives (*Les Vies des Hommes Illustres*) was republished at Paris in 1825 (10 vols.), with a *Notice sur Plutarque* by Coray. The name *Plutarch* is often given to a collection of lives of distinguished men. Such collections exist not merely in English, but also in French, Italian, Russian, German, and Swedish.

PLUTO (among the Greeks, *Ais*, *Aides*, *Hades*, the Invisible), third son of Saturn and Rhea, a brother of Jupiter and Neptune, to whom, on the partition of the world, fell the kingdom of the shades. There, under the surface of the earth, he is enthroned as the ruler of the dead. As far beneath his habitation as the heaven is above the earth, lies Tartarus, the access to which is by a gate guarded by himself; thither, after death, must all men descend. Powerful, terrible, inflexible to prayers or flattery, is the dark-haired god. Hercules, however, carried off his dog, the fearful Cerberus, who lies before Pluto's dreadful abode. He rides on a chariot drawn by four black horses, which he guides with reins of gold. His helmet makes the wearer invisible. So says the *Iliad*. The *Odyssey* gives a somewhat different account. It does not explicitly place his habitation beneath the earth. Ulysses sailed from Ææa with a north wind, passed over the ocean, and landed near the lofty rocks and the grove of Proserpine, where the Cimmerians dwell in everlasting darkness. Having arrived there, he proceeded along the ocean until he reached the nocturnal darkness, the abode of Ais, where dwell the dead. But according to Hesiod, on the western margin of the northern hemisphere, wrapt in eternal darkness, one cleft, in a cavity under the surface of the earth, leads down to the dead, another to Tartarus. Yet both of these subterranean abysses are mentioned by him under the latter name. Homer, and those poets who followed next after him, described the realms of Hades as being under the surface of the earth, where the dead, like the living on earth, good and bad, dwell together, and a few enemies of the gods alone suffer torments; Tartarus was a distinct region. But as philosophy, by bolder conjectures concerning the surface of the earth, and, finally, by the doctrine of a floating sphere, did away the old notions of Tartarus, and the belief of a future retribution gained ground: the realms of the dead, placed at first under the surface of the earth, and then by some in the centre, were separated into Elysium and Tartarus. These changes had also an influence on the notions entertained respecting the sovereign of the lower world. He not only gained in outward power and supremacy, but the conceptions of his character were changed; he became a benevolent being, who held in his hand the keys of the earth, and blessed the year with fruits; for from the abyss of night come all riches and plenty. It is therefore not strange, that the later ages, confounding Hades with Plutus, called him *Pluto*, and attributed to him dominion over the treasures concealed in the bowels of the earth. He fought with his brothers against the Titans, and received from the Cyclops, whom he had released, the helmet that makes its wearer invisible, which he lent to Mercury in the war of the giants, and to Perseus in his expedition against the Gorgons, and which afterwards came into the possession of Meriones. The Furies and Charon are his ministers. He judges every open and secret deed, and to him are subordinate the three judges Æacus, Minos, and Rhadamanthus. Bacchus, Hercules, Orpheus, and Ulysses entered his realms alive, and left them uninjured; but Theseus and Pirithous, whose object is said to have been the abduction of his wife, he caused to be chained, though the former is said to have been subsequently released by Hercules. The worship of Pluto was extensively spread among the Greeks and Romans. The cypress, the box, the narcissus, and the plant adiantum (maiden-hair), were sacred to him: oxen and goats were sacrificed to him in the shades of night, and his priests were crowned with cypress. He is represented in gloomy majesty, his forehead shaded by his hair, and with a thick beard. His head is sometimes covered with a veil. He frequently also wears his helmet, or a crown of ebony, or a wreath of adiantum or narcissus. In his hand he holds a two-forked sceptre, a staff or a key; by his side is Cerberus. He is either seated on a throne of ebony or in a chariot. His epithets are "the subterranean Jupiter," "the Stygian," &c.

PLUTUS, son of Iasion and Ceres, was the god of riches. His genealogy show the meaning of the allegory, which is merely this, that "Agriculture produces wealth." At first Plutus had the use of his eyes, but Jupiter struck him blind, because he confined his gifts to the good; and he thenceforth conferred them equally on the good and the bad. His residence was under the earth. He is weak, and limps when he comes to mortals, but swift-footed or winged when he leaves them. Fortune carries him in her arms, and he also forms one of Minerva's retinue. He is sometimes confounded with Pluto.

PLUVOISE. See *Calendar*.

PLYMOUTH; a borough town of England, in Devonshire, and, on account of its harbours and the docks in its neighbourhood, one of the most important maritime places in the kingdom. It is situated at the head of the capacious haven of Plymouth sound, on the eastern side of a tongue of land formed by the estuaries of the rivers Plym and Tamar, which here empty themselves into the sea. Plymouth stands at the mouth of the Plym, within about a mile and a half of the town of Devonport, formerly called *Plymouth Dock*, to which it is united by the intervening town of East Stonehouse. The town having gradually risen from the condition of a small fishing town to its present size, most of the streets are irregular, and by no means elegant or commodious; but the new parts of the town are handsome, and are spreading rapidly. The public buildings are, the custom-house, the exchange, the Athenæum, the public library, the theatre, the royal hotel, places of worship, the classical and mathematical school, the mechanics' institute, &c. Plymouth is divided into two parishes. Of the two parish churches, the most ancient is that of St Andrew, built previously to 1291, a handsome building of the Gothic order; Charles's church is also a Gothic structure. Among the charitable institutions, which are about thirty, are a work-house, a public dispensary, an eye infirmary, a lying-in charity, a public subscription school, alms-houses, Bible societies, &c. &c. Government has several military and naval establishments at this port. Of the fortifications, the most remarkable is the citadel, which was erected in the reign of Charles II. It was placed in a most commanding situation on the eastern end of the height called the *Hoe* (which shelters the town from the sea). It is exceedingly well fortified, and is constantly garrisoned. It contains the residence of the governor of Plymouth, and barracks for five or six hundred troops. Under the eastern walls of the citadel is the victualling office, an extensive range of buildings, containing the granaries and ovens for supplying the bread, as also the cellars and storehouses for wine, spirits, meat, &c., for the use of the king's vessels in harbour. The port of Plymouth is distinguished for its capacity, and the security which it affords in its several parts. It is capable of containing 2000 sail, and is one of the finest harbours in the world. It consists of three divisions or harbours,—Sutton pool, immediately adjoining the town; Catwater, an extensive sheet, formed by the estuary of the Plym; and the harbour or bay of Hamoaze. At the mouth of these harbours the great bay of Plymouth sound forms an excellent roadstead, which is now completely secure by the erection of the breakwater across its entrance. This work is an insulated mole, or vast heap of stones, stretching across the entrance of the sound, so far as to leave a passage for vessels at either end, and opposing a barrier to the heavy swell rolling in from the Atlantic. Its length is 1760 yards, the eastern extremity being about 60 fathoms to the eastward of St Carlos's rocks; and the western, 300 west of the Shovel rock. The middle part is continued in a straight line 1000 yards, and the two extremities incline towards the northern side of the straight part in an angle of about 120 degrees. This great work was begun Aug. 12, 1812. During its progress, convincing proofs of its efficacy and utility were afforded. The expense of erecting the breakwater is estimated at £1,171,100. The Eddystone light-house is an important appendage to the harbour; the entrance of which would, without this beacon, be extremely dangerous. (See *Eddystone*.) Besides the importation of coals, culm, corn, wine, timber, and articles for home consumption, Plymouth carries on a considerable trade much promoted by the establishment of a chamber of commerce, in the year 1813. The garrison at this port is under the command of a military officer styled the *governor*, who is also generally commander-in-chief of the western district. The naval affairs are under the direction of the port-admiral, whose residence is at Devonport. In the 18th year of Henry VI., Plymouth was incorporated as a borough. Plymouth is 218 miles from London, and 44 from Exeter; lon. 4° 7' W.; lat. 50° 23' N. Population in 1831, 75,534.

PLYMOUTH; a post-town, port of entry, and shire town of Plymouth county, Massachusetts, formerly the capital of the Plymouth colony, and the oldest town in New England. It was settled by the pilgrims, who arrived in the May Flower, December 22, 1620. It stands on a fine harbour of the same name, 36 miles south-east of Boston. The court-house is in lat. 41° 57' N.; lon. 70° 42' 30' W. The township, though often divided, is still sixteen miles long, and five broad. The harbour is spacious, but shallow. The town has considerable commerce, and valuable manufactures of iron. An elegant hall has been erected for the use of the Pilgrim society. Population, in 1820, 4348; in 1830, 4751. The Indians called this town *Accomack*. A part of the rock on which the pilgrims landed has been conveyed to the centre of the town.

PLYMOUTH, COLONY OF. See *New England*.

PNEUMATICS (from the Greek *πνευμα*, air) is that branch of natural philosophy which treats of the mechanical properties of elastic fluids (see *Elasticity*), the inelastic fluids belonging to the province of hydraulics and hydronamics (*see the articles*). The elastic fluid with which we are most familiar is atmospheric air; and it possesses all the mechanical properties, which it is necessary to notice in any elastic fluid. The laws of pneumatics will be found treated of under the heads of *Air*, *Air-pump*, *Barometer*, *Pump Acoustics*.

PNEUMONY; inflammation of the lungs. The species, according to Cullen, are peripneumony and pleurisy. (See *Pleurisy*.) The most general cause of this inflammation is the application of cold to the body, which gives a check to the perspiration, and determines a great flow of blood to the lungs. It attacks principally those of a robust constitution and plethoric habit, and occurs most frequently in the winter and spring. Other causes are violent exertions in singing, speaking, or playing on wind instruments. The true peripneumony comes on with an obtuse pain in the chest or side, great difficulty of breathing (particularly in a recumbent position, or when lying on the side affected), together with a cough, dryness of the skin, heat, anxiety and thirst. If relief is not afforded in time, and the inflammation proceeds with violence, the face will alter to a purple colour; an effusion of blood will take place into the cellular substance of the lungs, so as to impede the circulation through that organ, and the patient will soon be deprived of life. When it goes off by resolution, some very evident evacuation attends it; the evacuation which most frequently terminates the complaint, and which does it with the greatest effect, is a free and copious expectoration of thick white or yellow matter, slightly streaked with blood; and by this the disease is carried off generally in the course of ten or twelve days.

PO (*Padus*, *Eridanus*), the largest river of Italy, rises in mount Viso, in the Cottian Alps, Piedmont, at an elevation of 6000 feet above the sea. It flows from west to east through Piedmont, and from Pavia forms the southern boundary of the Lombardo-Venetian kingdom, which it separates from the Sardinian territories, from Parma, Modena, and the States of the Church. It receives, during a course of 320 miles, the Doria, Sesia, Tessino, Adda, Oglio and Mincio from the left, the Tanaro with the Stura, the Scrivia, Trebia, Taro, Lenza, Crostolo, Sechia, Panaro and Reno from the right, and empties itself by four mouths into the gulf of Venice. It is the main channel of commercial communication in Upper Italy, but it often does great mischief by its inundations, and it occasionally changes its bed; the swamps which it leaves are used for the cultivation of rice. In many parts of its course it is confined by dikes. The canal Gran Naviglio connects the Tessino with the Po, in a straight line.

POCAHONTAS, daughter of Powhatan, a celebrated Indian warrior in Virginia, was born about the year 1595. She discovered the warmest friendship for the English, who colonized Virginia when she was about twelve years old, and was eminently useful to the infant settlement. The first remarkable evidence of this attachment was displayed in 1607, when captain John Smith was taken prisoner by her countrymen, and brought before Powhatan, that he might put him to death. As the savage lifted his club to dash out the brains of the prisoner, whose head was laid on a stone at his feet, Pocahontas threw herself on Smith's body, and prevailed on her father to spare his life. Captain Smith was suffered to return to Jamestown, where he sent presents to Powhatan and his benefactress. From this time, Pocahontas frequently visited the settlements of the whites, to whom she furnished provisions at times when they were particularly needed. In 1609, Powhatan invited Smith to pay him a visit, promising him a supply of provisions, but designing to entrap and destroy him and his party. Pacahontas, becoming informed of this plot ventured through the forest at midnight, to disclose it to Smith. For three or four years she continued to assist the settlers in their distresses, and to save them from the effects of her father's animosity. During this period the infant colony had experienced numerous vicissitudes of good and bad fortune. Smith had been driven by faction to England, and the rapacity of his successors plunged the settlement into an Indian war. An attack was made on one of the forts by the Indians under Powhatan, when the commander and thirty men were slaughtered, only one person, a boy, surviving, who was saved by Pocahontas. About the year 1612, Pocahontas,—from what cause is not ascertained, but most probably on account of her extraordinary attachment to the whites,—incurring her father's resentment, left her home, and visited the territory of Japazaws, chief of Potowmac. Captain Argall, coming up the river on a trading expedition, and conceiving that Pocahontas would be a valuable hostage, prevailed on Japazaws, by the tempting offer of a copper kettle, to surrender her to him. Powhatan refused to ransom her on the terms proposed. During her detention, Mr Thomas Rolfe, an Englishman of respectable character, became attached to her, and offered her his hand. It was accepted, and, the consent of Powhatan being obtained, the marriage was solemnized in presence of the uncle of Pocahontas and her two brothers. This event relieved the colony from the enmity of Powhatan, and preserved peace between them for many years. In the year 1616, Pocahontas embarked with her husband, and several Indians, of both sexes, for England, where she was baptized, exchanging her Indian name for that of Rebecca. She became a subject of curiosity to all classes of people. She received, in London, a visit from her former friend, captain Smith, whom, for some unknown purpose, she had been taught to believe was dead. When she first beheld him, she was overcome with emotion, and, turning from him, hid her face in her hands. During her stay in England, she advanced greatly in the knowledge of the English language, and her conversation was much sought after at court. Her residence among civilized men, however, was destined to be short. While about to embark from Gravesend, in company with her husband and an infant son, to revisit her native land, she died, at the age of twenty-two years, leaving one son, who was educated by his uncle, in London, and afterwards became a wealthy and distinguished character in Virginia. His descendants still exist in that commonwealth.

POCOCK, Edward, an Oriental critic, was born November 8, 1604, and educated at Oxford, his native place. He prepared for the press such parts as had not been edited of the Syriac New Testament, from a manuscript in the Bodleian library (Leyden, 1630, 4to). In 1629, Pocock was appointed chaplain to the English factory at Aleppo, and applied himself there to the cultivation of Oriental literature. He was employed by Laud to collect manuscripts and coins for the university of Oxford; and, in 1636, was invited to fill the newly founded Arabic professorship at Oxford. He subsequently undertook a second voyage to the East, and remained some time at Constantinople collecting ancient manuscripts. He returned in 1640, and assisted Selden in the publication of part of the annals of Eutychius, under the title of *Origines Alexandrinæ* (1641.) In 1648, he was appointed Hebrew professor at Oxford, to which the king, then a prisoner in the Isle of Wight, added the rich canonry of Christ-church; and the grant was confirmed by the parliament. In 1649, he published *Specimen Historiæ Arabum* (4to, reprinted at Oxford, in 1805). In 1650, he was deprived of his canonry, for refusing to subscribe the engagement required by the parliament. In 1655, he published some of the writings of Maimonides, under the title of *Porta Mosis*, and assisted in Walton's Polyglot Bible. In 1658 appeared his edition of the Annals of Eutychius, in Arabic, with a Latin version (2 vols., 4to.) The restoration, in 1660, enabled him to recover his church preferment; and the same year he printed an Arabic translation of Grotius's work on the Truth of Christianity. In 1663, he produced an Arabic and Latin edition of the *Historia Dynastiarum* of Abulfaragius (2 vols., 4to.) He died at Oxford, in 1691, leaving Commentaries on the Minor Prophets, and some other works.

POCOCKE, Richard, a divine and Oriental traveller, was born in 1704, at Southampton, and received his education at Oxford. He engaged in a voyage to the Levant, in 1737, and, after visiting Egypt, Arabia, Palestine, and other countries, returned home, through Italy and Germany, in 1742. He published, in 1743—1745, A Description of the East (2 vols., folio), comprising an account of those parts of the world in which he had travelled, and containing much curious information. He was promoted to the see of Ossory, in 1756; whence, in 1765, he was translated to Elphin and Meath. He died of apoplexy the same year.

PODAGRA (from *ϖους*, foot, and *αγρα*, pain); that species of gout which recurs at regular intervals, attacking the joints of the foot, particularly of the great toe, and attended with sharp pain. The pain is described as resembling that produced by laying a burning coal upon the toe, or by forcing asunder the joint with a red hot iron. When the disease is violent, the whole foot is so sensitive, that the slightest pressure, the lightest touch, or even the agitation occasioned by a strong draught of air, causes the most excruciating pain. The first stage of the disease is peculiarly painful, on account of the inflammation of the surfaces of the joints, by which the nerves are affected. In a week, or sometimes a fortnight, the inflammation subsides, the pain ceases, and the part becomes swollen. The swelling contains the product of the gouty inflammation, lymphatic mixed with earthy substance. It gradually subsides, leaving here and there swellings on the foot. The attacks usually recur once a year, in spring or autumn, sometimes twice, and even oftener. As long as they are regular, they are not dangerous, as nature has the power of throwing off the disease in the extremities. The notion that there is no remedy against the podagra, and that a person who has been once attacked can never be cured, is erroneous. By shortening the period of inflammation, the secretion of the gouty matter may be promoted, and the pain more speedily assuaged. In the interval of the attacks, if attention is paid to the diet and manner of living, if the patient confines himself to simple food, and avoids the exciting causes of the disease, its violence may be gradually diminished, and the disease itself may be eradicated; while, by the neglect of these precautions, it continually becomes aggravated, and, as the system grows weaker, irregular and retrocedent, in which stage it is often fatal. See *Gout*.

PODALIRIUS. See *Æsculapius*.

PODOLIA; a government of Russia, bounded north by Volhynia and Grodno, east by Ekaterinoslav and Cherson, south by Moldavia and the Dniester, and west by Bukowine; population, 1,462,000 square miles, 20,350. It is divided into 12 circles. The inhabitants are mostly Poles, but Russians and Jews are numerous.

PŒCILE (ποικιλη); a portico in Athens, containing a picture gallery. (See *Polygnotus*.) Zeno taught his doctrines here, whence he was called the *stoic* (from στοα, a portico), and his school, the *stoic school*. See *Zeno* and *Stoics*.

POELENBURG, Cornelius, a painter, born at Utrecht, 1586, became a pupil of Bloemaert, and afterwards went to Rome. Here he studied Raphael's works; but he was deficient in design, and therefore confined himself principally to natural scenes on a small scale, in which he excelled. Rubens adorned his own cabinet with Poelenburg's productions. Charles I. invited him to England, where he painted a portrait of the king and other works, but soon returned home, and died at Utrecht, in 1660. His works are rare, and esteemed for delicacy of touch and sweetness of colouring.

POETICS. See *Poetry*.

POET LAUREATE. Among the Greeks, from whom the custom was also adopted by the Romans, it was the practice to crown the successful poets in the musical contests (see *Music*) with a wreath of laurel. The emperor Domitian crowned with his own hand poets and orators, at the Capitoline games, which had been instituted by him. In the thirteenth century, the custom was renewed by the Italians, and the crowning of Petrarca in the capitol was solemnized with great pomp. Every one must recollect the description of the coronation of Corinne. The German emperors conferred the title of poet laureate (*gekrönte dichter*, or, as he is called by the Italians, *poeta cesareo*) on their court poet. Conrad Celtes was the first who received that honour. The emperors also granted to the counts palatine the right of conferring that title. In England, the first mention of a king's poet, under the title of poet laureate, occurs, according to Warton, in the reign of Edward IV. from whom John Kay received it. *Poeta laureatus* was, however, also an academical title in England, conferred by the universities when the candidate received the degrees in grammar (which included rhetoric and versification). The last instance of a laureated degree at Oxford occurs in 1512. Skelton was laureated at both universities (in 1489 and 1493), and seems also to have been court laureate to Henry VIII. Ben Jonson was court poet to James I., and received a pension, but does not appear to have had the title of laureate formally granted him. Dryden was appointed laureate to Charles II., and afterwards to James II., by regular patent under privy seal. (See his prose works by Malone.) The first patent of this kind, issued in the reign of Charles I. (1630), assigns as the yearly gratuity to the laureate £100, and a tierce of Canary wine out of the royal cellars. Nahum Tate, Rowe, Eusden, Cibber, Whitehead, T. Warton, Pye (who consented to a commutation of his wine for £27), and Southey (1813), have been the successors of Dryden.

POETRY, POESY (from the Greek ποιησις, from ποιω, I create, or produce, with reference probably to the creative power essential to a poet). The numberless unsuccessful attempts to define poetry warn us against circumscribing within the compass of a few words, a subject so vast, so variegated, and so interwoven with all the activities of the human spirit. The definitions usually given, even if true, amount only to illustrations or explanations. To make a full exposition of our views on this subject would far exceed our limits. One of the chief traits of the poetical is, that it peculiarly affects the imagination and the feelings. When we speak of actions or the creations of genius as poetical, the term implies further that they had their origin in conceptions in which the imagination and the feelings were chief agents. Hence the universality of poetry; hence the preponderance of the poetical in the language and conceptions of early nations. A common idea, the result of experience, or simple reasoning may be conceived (and accordingly expressed) by the poet in such a way as to strike our feelings with peculiar force, or ideas which, though elevated in themselves, are familiar to all, may receive new impressiveness from a new and striking way of expressing them. For instance, the precept to love our enemies; who does not feel that this elevated sentiment is rendered still more striking by the illustration of Menou, who adds to the precept, "like the sandal tree, which sheds perfume on the axe that fells it?" A great part of poetry, in fact, consists in a striking expression of common ideas, because it is impossible that a poet should always have new ideas. It is gratifying to find a new conception of a familiar idea presenting the subject in a light in which we had never viewed it. But if the language addressed to feeling and imagination chiefly, is often used to convey a plain idea poetically, or to give a familiar one a new charm, this language, on the other hand, is often the natural expression of an elevated imagination, which soars through regions to which our wishes, hopes and faith aspire, and speaks in metaphors because common language is inadequate to express its conceptions. Poetry has been divided into natural and artificial; the former signifying that poetry which consists in conceptions only, and not in the expression and arrangement of them by the rules of art. According to its subjects, and the relation which the poet holds to his productions, it is divided into the poetry of subjective feeling, or lyrical poetry (see *Lyrics*); narrative poetry (see *Epic*), and that which presents actions as happening, while the poet himself is kept entirely out of view; dramatic poetry (see *Drama*). The name *machinery* is given in epic and dramatic poetry to superhuman beings introduced by the poet to solve difficulties or perform exploits which surpass human power.

Poetics is the theory of poetry, and is partly a branch of practical æsthetics, partly a branch of philology; the former, as far as the principles of the beautiful and of the fine arts are applied to poetry; the latter, as far as it is the theory of poetic style, or the technical part of poetry. It is one of the theories earliest developed,—nay, æsthetics grew out of it. Among the Greeks, Aristotle treated it in his περι Ποιητικης, of which we only possess a fragment (best edition by Gottfr. Hermann). Horace, in his *Ars Poetica*, or letter to the Pisos, shows himself his pupil. In modern times, it has been treated by Marc. Hier. Vida, Torquato Tasso and many other Italians, Nic. Boileau, Jul. Cæs. Scaliger, Ger. Voss, L. Racine, D'Alembert, Marmontel, Baumgarten, the founder of æsthetics, Joh. Ad. Schlegel, Salzer, Engel, Jean Paul Fr. Richter (in his *Vorschule der Æsthetik*) and Clodius. Besides these, the theory of poetry in general has been treated by Lessing, Klopstock, W. von Humboldt, Herder, Schiller, Goethe, the Schlegels, Muller and others; in English, by Blair, Wordsworth, Campbell, Hazlitt, and others.

We may divide the history of poetry into two periods; the one before the birth of Christ, the other since. The Hebrews are the first people from whom poetical productions have descended to our times. Only obscure traces remain of any earlier poetry of the Indians, Persians, Syrians and Arabians. The religious poetry of the Hebrews is of very ancient date, and possesses a solemn character, distinct from that of the other nations of antiquity. It begins with cosmogony, becomes at a later period of a warlike character, then assumes the form of sacred songs in the time of David, and attains under Solomon (from 1044 to 975) its greatest elevation, after which it assumes a prophetical character. (See *Hebrews*.) We next come to classic antiquity, and become acquainted with poetry in the plastic character, which it assumed in Asia Minor and Greece, under the influence of the prevailing paganism, which received such rich and various hues from the glowing imagination of the people. Greek poetry may again be divided into three periods: the first of these extends from the earliest times of Greece to the Persian war. Greek poetry begins in Thrace and Asia Minor, and the great national epic of Homer, or the Homerides, the rhapsodists, the cyclic and gnomic poets, indicate a wide diffusion of poetry at that time. Lyric poetry soon attained a peculiar eminence. The second period extends from the Persian war to the time of Alexander the Great. It is the flourishing period of the dramatic art, and of cultivated Greek poetry in general. The third period shows the decline of Greek poetry under the successors of Alexander, and the revival of the same in Alexandria. (See *Greek Literature*.) From the Greeks we turn to their imitators, the Romans, whose language was not employed in poetry till a late period, and who, until the second Punic war, or until the time in which they became closely connected with the Greeks, made only rude essays in poetry. The era of Augustus and Tiberius was the golden age of their poetry, and it thence declined continually, until the introduction of the Christian religion, and the irruption of the barbarians. The fragments which have come down to us from the flourishing period of Indian poetry, some centuries before Christ, are of an original character and peculiar delicacy. The second chief period of the times since Christ (see *Modern* and *Romantic*), first shows us the Latin language applied in the Christian worship to a mystic religious poetry; and later, in the ninth, tenth, and succeeding centuries, employed by learned men in imitations of the old Roman poetry; contemporary with these we witness the rise of Arabian poetry, (q. v.) A peculiar poetry sprung up in the modern languages among the French, at the time of the Provençals or Troubadours, in the eleventh century. In its devotion, valour, and love, the spirit of chivalry is apparent. (See *Romantic*.) This romantic poetry of the Franks declined into mere artificial rhyming, after the end of the twelfth century. Under the dominion of Francis I., poetry somewhat revived; but the age of Louis XIV. was the golden era of French poetry; although it often, but in its own manner, imitated the ancients, and modernized ancient materials. Rhetorical elegance and easy wit were its chief aim. (See *French Literature*.) The modern Italian poetry sprung from the Provençal. But a poetry of a natural character began in Sicily, after the thirteenth century, and flourished, peculiarly from the time of Dante and Petrarch to to that of Ariosto and Tasso, in the thirteenth, fourteenth, and fifteenth centuries, and thence declined into bombast and imitation. (See *Italian Poetry*.) The Spanish poetry appears originally the sister of the Provençal, but mingled with the Oriental character. The earliest Castilian poetry, properly so called, belongs to the thirteenth century; but it began to flourish under the administration of Charles I., and declined under Philip IV. Simultaneous with it, and in connexion with it, flourished the Portuguese. (See *Spanish Literature*, and *Portuguese Literature*.) The German poetry, which is closely connected with the northern, and has its own epic cycle, flourished at various times, and with much variety of character, but most vigorously when free from the influence of foreign models. (See *German Poetry*.) The origin of the English and Scottish poetry is lost, like that of the German in the distant period of the bards; it was refined by the Norman French poetry. But the flourishing period of English poetry is placed in the times of queen Elizabeth, although Chaucer is esteemed the father of modern English poetry. The Scandinavian poetry, otherwise called northern, presents chivalry peculiarly coloured by the northern character, since the thirteenth century, when the German *Heldenbuch* (book of heroes) was introduced into Norway, and foreign tales became blended with native ones. In the fourteenth century, the poetry of the mastersingers took the place of that which had been founded on the ancient sagas. (See *Danish and Swedish Language and Literature*.) These are the principal divisions in the history of poetry. For further information, see Warton's *History of English Poetry*, Sismondi's *Littérature du Midi de l'Europe*, Bouterwek's *History of modern Poetry and Eloquence* (in German.)

POGGIO BRACCIOLINI, one of the early promoters of literature in Italy, was born at Terranuova, in the Florentine territory, in 1380. On completing his education, he went to Rome, where he obtained the office of writer of apostolical letters, and in 1414 attended John XXII. to the council of Constance. In 1416 he undertook the task of searching the monasteries for ancient manuscripts; in that of St Gall he discovered a complete copy of Quintilian, with a part of the Argonautics of Valerius Flaccus, and in other religious houses several of Cicero's orations, and obtained copies of the works of Silius Italicus, Vegetius, Ammianus Marcellinus, Columella, &c. In 1418, on the invitation of cardinal Beaufort, he visited England; but the barbarism of the country at that period soon led him to return, and he finally attached himself to Cosmo de Medici. In 1440, he published his Dialogues on Nobility, one of the most finished of his works. In 1453, he was chosen chancellor to the Florentine republic. His History of Florence had not received its last polish at his death, in 1459. Poggio was licentious, quarrelsome, and intemperate in controversy; but his sentiments are in general liberal and manly, and he may be deemed the most elegant composer in Latin (the language of all his works) of that period. His writings are numerous, and upon various topics. Many are discussions on moral arguments, a few are philosophical, and several controversial: the remainder are chiefly translations, orations, and letters, the chief fault of which is diffuseness. His *Historia Florentina*, which comprises the period from 1350 to 1455, is to be found in the collections of Grævius and Muratori. The whole of the works of Poggio were published together at Basil, 1538.—See his life by Shepherd (Liverpool, 1802).

POICTIERS. See *Poitiers*.

POINT, in music, as conjoined with others, has various significations. The different uses to which points were formerly applied, render the perusal of old compositions extremely difficult and perplexing. In those works we meet with the *point of perfection*, *point of augmentation*, *point of division*, and *point of alteration*. The *point of perfection* was added to those notes which were denoted by the modal signs to be perfect, or equal to three notes of the same value, but which were rendered imperfect by position. The *point of augmentation* is that in modern use, which the old masters used only in *common* or *imperfect* time. The *point of division*, or *imperfection*, was placed between two shorter notes that followed, and were succeeded by two longer, in perfect modes, to render both the long notes imperfect. The *point of alteration*, or of *duplication*, was placed before two shorter notes preceding a longer, in order to double the length of the second short note. In modern music, the *point*, taken as an increased power of the note, is always equal to the half of the note to which it appertains.

POINT, in geometry, as defined by Euclid, is a quantity which has no parts, or which is indivisible. Points are the ends or extremities of lines. If a point is supposed to be moved any way, it will, by its motion, describe a line.

POINT is also an iron or steel instrument, used with some variety in several arts. Engravers, etchers, cutters in wood, &c., use points to trace their designs on the copper, wood, stone, &c.

POINT, in manufactures, is a general term used for all kinds of laces wrought with the needle: such are the *point de Vénise*, *point de France*, *point de Gènes*, &c., which are distinguished by the particular economy and arrangement of their points.

POINT, among sailors; a low arm of the shore which projects into the sea, or into a river, beyond the contiguous part of the beach. *To point a gun*; to direct it towards any particular object or point.

POINT BLANC, in gunnery, denotes the shot of a gun levelled horizontally.

POINT COMFORT, OLD; a cape on the coast of Virginia, at the mouth of James river, on the north side, about ten miles south-east of Hampton, twenty north of Norfolk; lon. 76° 20′ W.; lat. 37° 3′ N. Extensive fortifications have been erected here; and at the Rip Raps, one mile distant, a mount has been formed by placing stones in the water, thus forming an island of four acres, with fortifications commanding the entrance of the river.

POINTER. The dog called *pointer* is found in Spain, Portugal, and France, with but slight difference of form. It is not a native of England, but has long since been naturalized there. "Those pointers," says Johnson in his Shooter's Companion, "which I have seen direct from Spain, are heavy and clumsily formed; those from Portugal are somewhat lighter; while the French breed is remarkable for a wide furrow which runs between the nostrils, and gives to the animal's countenance a very grotesque appearance. They are all thick and heavy, with large, chubby heads, long, pendent ears, and short, smooth hair; they are often ill tempered and snappish, and, in fact, are good for little in this country till they have been crossed with the more generous blood of these islands. Yet the conjunction of the setter and pointer is by no means advisable. Excellent pointers have been produced by the fox-hound and the Spaniard. In crossing with the Spanish pointer, the deep-flewed hound is to be preferred, and from judicious crossing excellent pointers are to be met with in most parts of England. They differ from the setter, as, when they have approached sufficiently near the game, they stand erect, whereas the true-bred setter will either sit upon his haunches, or lie close to the ground, generally the latter. Pointers often suffer much from sore feet. I have generally found white-footed dogs much more tender in this respect than those whose feet are of a dark colour. Pointers are sometimes used with bells round their necks in cover shooting. When the dog sets, the ringing ceases, and the shooter proceeds to the spot. Pointers are very susceptible of education, and not so apt to forget their lessons as the setter, and their speed, strength, and persevering spirit, enable them to continue the chase for a length of time almost incredible." Pointers are used in finding feathered game of various sorts, partridges, pheasants, &c.

POINT OF SIGHT. See *Perspective*.

POISON. A poison is any substance of which a small quantity taken into the stomach, mixed with the blood by wounds, or through the lungs, or absorbed through the skin, can produce changes in the bodies of brutes or men, deleterious to the health, and even destructive to life, by means not mechanical. Many poisons operate chemically, corroding the organized fibre, destroying the form and connexion of the parts, exciting powerfully, and causing inflammation and mortification. To this class belong most of the poisons of the mineral kingdom; as, 1. Many metallic oxides and salts, as arsenic, one of the most destructive poisons, of which a few grains produce fatal effects. Many preparations of copper are also poisonous, as verdegris, and many paints; also very acid or salt articles of food or drink cooked in copper vessels. Many preparations of quicksilver, as corrosive sublimate, red precipitate, &c., some common preparations of antimony, should also be named here. 2. Strong mineral and vegetable acids, when introduced into the body in an undiluted state, as concentrated sulphuric acid or oil of vitriol, nitric acid, or aquafortis, muriatic acid, &c. 3. Some plants contain an extremely powerful and corrosive substance, as the wolf's milk (*euphorbium esula*), the *daphne mezereum*, &c. 4. Of the animal kingdom, the *cantharides* (q. v.), or *Spanish flies*, as they are called. The operation of all these poisons is very expeditious; when they enter the stomach, violent sickness is felt, incessant straining and vomiting take place, with most excruciating pains in the stomach and bowels, as if knives were driven through them; then follows inflammation, if relief be not speedily obtained, and this is succeeded by mortification. Other poisons operate more by a powerful action upon the nerves, and a rapid destruction of their energy. These are the sedative or stupifying poisons, and belong for the most part to the vegetable kingdom. Their effects are sickness, violent headache, dizziness, darkness or spots before the eyes, powerful and involuntary motions of the limbs and of the whole body; distortion of the eyes, anguish, loss of consciousness, and at last apoplexy and death. To this class belong opium, hemlock, henbane, belladonna, &c. There is also a similar poison contained in the bitter almond and in the kernel of peaches, which is rapidly destructive of life (the Prussic acid), which shows its effects either when those substances are taken into the stomach in great quantities, or when their concentrated oil, obtained by distillation, is swallowed.

The same substance is found in the cherry laurel; and, among the productions of the animal world, in the Prussian blue. Among plants, there are many which unite the properties of both kinds, which stimulate by means of a sharp, acid substance, and are also subsequently sedative, from the operation of a narcotic principle. To these belong the purple foxglove (*digitalis purpurea*), the monks-hood (*aconitum napellus*), &c. Other poisons operate by suddenly and entirely destroying many of the functions necessary to life. To this class belong all the kinds of gas and air which are irrespirable, suffocating vapours, as carbonic acid gas, or fixed air in cellars, where beer is working, wells, &c., fumes of sulphur and charcoal, air corrupted by the respiration and perspiration of many people in closed rooms, concentrated effluvia of flowers in similar places, &c. Many preparations of lead, as sugar of lead, white lead, wine sweetened by the addition of lead, are to be counted in this class, since they destroy the activity of the absorbent vessels in the abdominal canal, contract the bowels, produce colicky pains, and finally prevent the absorption of the chyle by which the body is to be nourished. Pope Clement XIV., according to the common belief in Italy, was destroyed by a terrible poison, called *l'acquetta*. The Indians of South America, between the Amazon and the Orinoco, apply a very powerful poison, called the *Wourali* poison, to the heads of the arrows with which they shoot their game. It destroys life very quickly, without corrupting or imparting any bad quality to the flesh. (See Waterton's *Wanderings*, description of his first journey.) The so called *morbid poisons*, or *contagions*, do not belong to this class, and are very improperly called *poisons*, as for instance, the poison of hydrophobia. See *Contagion*.

Every substance is called an *antidote*, which counteracts the effect of a poison, more especially the remedies which belong to each kind of poison respectively. Antidotes are as various as poisons. They sometimes protect the body against the operation of the poison, sometimes change this last in such a manner that it loses its injurious properties, and sometimes remove or remedy its violent results. Thus, in cases of poisoning by acrid and corrosive substances, we use the fatty, mucilaginous substances, as oil, milk, &c., which sheath and protect the coats of the stomach and bowels against the operation of the poison. Against the metallic poisons, soap and liver of sulphur are most efficacious, as they prevent the operation of the poison by combining the alkali and sulphur with the corrosive particles of the metal. Oil, alkalies and soap are the best remedies for the powerful acids. For cantharides, mucilage, oil and camphor, are employed. We oppose to the narcotic poisons the weaker vegetable acids, vinegar, the acid virus, coffee. Prussic acid is neutralized by alkalies and iron. To arouse those poisoned by opium, we use wine, coffee, brandy, camphor, &c. It was formerly believed that all poisonous matters could be thrown out of the body with the perspiration; and hence we find among the old antidotes a large number of sweating medicines. In this idea originated the *alexipharmacon* of the ancients, the famous *mithridate*, the *theriaca*, &c., which produced, however, no other effect than increased activity of the nervous and circulatory system, from which followed sweats, and perhaps as much harm as good to the sufferer.

POITIERS (anciently *Pictavi*); a town of France, on the Clain, formerly capital of the province of Poitou, at present of the department of the Vienne; population, 21,562; lat. 46° 35′ N.; lon. 21′ E.; 68 leagues south-west of Paris. It is a very old place, surrounded by a wall, with narrow, crooked streets; its cathedral is only remarkable for its age; it contains several literary institutions, and some manufactures. Poitiers is celebrated for the battle fought in its vicinity (at Maupertuis), between the French, under their king John, and the English, under Edward the Black Prince, Sept. 19, 1356. (See *Edward III.*, and *Edward, Prince of Wales.*) The English army did not exceed 12,000 men; the French was not less than 60,000; but the English were superior in discipline and subordination. The French van was at once routed, and their centre was broken almost at the first onset. John was made prisoner after an obstinate resistance, and, though treated with great courtesy by the conqueror, was detained prisoner in London for four years, and obliged to purchase his freedom by the cession of several provinces and the payment of 3,000,000 crowns of gold. (See Froissart, liv. i, ch. 158—174, and ch. 212.)

POITIERS, DIANA OF. See *Diana of Poitiers*.

POITOU, OR POICTOU; before the revolution, one of the provinces of France, in the western part of the kingdom, between Brittany and Anjou on the north, Berry on the east, the Atlantic on the west, and Angoumois and Saintonge on the south. The departments of the Vienne, the Deux-Sevres and the Vendèe have been formed out of this province. (See *Department.*) Henry II. of England acquired possession of Poitou by his marriage with Eleanor, heiress of the last duke of Aquitaine. Philip Augustus conquered it. It was ceded to the English by the peace of Bretigny (1360), but was recovered by Charles V.

POLA (*Pietas Julia*); a town of Istria, belonging to the circle of Trieste, in the Austrian kingdom of Illyria. It is a bishop's see, and, although reduced to a population of 8—900, contains traces of its flourishing condition under the Romans. Within its ancient walls are seen the ruins of an amphitheatre, which is estimated to have been large enough to accommodate 18,000 persons. Spon first directed the attention of the public to Pola, and Cassa's excellent sketches of its ruins have increased the interest. (See his *Voyage pittoresque de l'Istrie et de la Dalmatie.*) The amphitheatre is equal to any thing of the sort that has come down to us. It differs from the others with which we are acquainted, in having four buttresses at the four corners of a quadrangle. According to Cassa, it is not built of the Istrian stone, which is so much esteemed by architects. It consists of three stories, each of which contains seventy-two arcades. There are no stairs remaining, but the exterior walls are almost entire. The two temples, one of which is in good preservation, belong to a period of pure taste. Pola was most flourishing in the reign of Severus, when it assumed the proud title of *Respublica Polensis*. A triumphal arch, erected by Salvia Posthuma in honour of her husband, Sergius Lepidus, is in a pretty good condition, and, under the name of *porta aurea*, is used as a gate of the town.

POLACCA, ALLA. See *Polonaise*.

POLAND (in Polish, *Polska*; in German, *Polen*; in French, *Pologne*); an extensive country in the northern part of Europe, extending from the foot of the Carpathian mountains, and the fertile plains of the Ukraine (lat. 47°), to the shores of the Baltic (56° lat.), and from the 15th to the 32d degree of east longitude. It derives its name, which signifies, in the Sclavonic dialect, a *plain*, from the level character of its surface. Although it has ceased to constitute an independent and single state, still the country is distinctly separated from those which surround it by national character, language, and manners;

it is still the land of the Poles, although its detached fragments have become Austrian, Prussian, or Russian provinces, containing about 20,000,000 Poles. (See *Galicia*, *Cracow*, *Posen*, *Lithuania*, &c., and the following article.) After the annexation of Lithuania in the end of the 14th century, the whole Polish territory comprised an extent of 284,000 square miles, and was divided into Great and Little Poland on the west, Masovia and Podlachia in the centre, with Volhynia, Podolia, and the Ukraine towards the east, and Lithuania in the north-east. The inferior divisions were thirty-one palatinates and *starostys*. The face of the country is almost everywhere low and level, and in many places marshy. All the great rivers, except the Niemen, run in shallow channels, and overflow their banks. After a rainy season, whole provinces appear inundated, and the waters of distant streams flow into each other. The Carpathian mountains form the south-western boundary of the country, and another low ridge penetrates it from Silesia. In the rest of the country, the ground is highest along a curved line extending throughout the middle of the (old) kingdom from Hungary to Lithuania, and indicated not by conspicuous elevations, but by the course of the waters; the rivers on the west side flowing into the Baltic, and those on the east into the Euxine. Of the former, the principal are the Vistula, the Bug, the Niemen, the Pregel, the Dwina; of the latter, the Przypiec, the Dnieper and the Dniester. The east winds from the frozen plains of Russia, and the south winds from the Carpathians, render the winters as severe in Poland as in Sweden, although there is a difference of 10° of latitude. Vegetation is a month later than in the same latitudes on the western shore of the continent. The humidity and cold of the climate, joined to the exhalations from the marshes and vast forests, render the Polish countries unhealthy. (See *Plica Polonica*). The most pleasant and fertile part is the south-east (See. *Ukraine*). The country abounds in iron, but of indifferent quality; lead, gold and silver are also found. There are very rich salt mines at Bochnia and Wieliczka, both situated in Galicia. The state of cultivation is extremely wretched; yet the climate is so regular, and the soil so productive, that the average annual export of corn has been estimated at 4,000,000 English quarters. The export of cattle is also of considerable extent. Poland is poor in fruits; flax and hemp are raised, and in some of the provinces there is a great abundance of wood. The peasantry are in a wretched condition, dirty, improvident, indolent, addicted to intoxication, and of course poor. The general aspect of the country is rude and backward; the roads are bad, and the inns miserable. The Russian kingdom of Poland, which, before the cessions at Andrussow in 1667, contained 16,000,000 inhabitants, now contains on a surface of 48,600 square miles, in 482 towns (viz. 211 immediate and 271 mediate towns), and 22,694 villages, 3,850,000 inhabitants (in 1818, the number was 2,734,000), among which are 212,944 Jews. The capital, Warsaw, contained, previous to the late insurrection, 135 000 inhabitants. Poland was divided, in 1816, into eight waywodeships—Masovia (capital, Warsaw,) Kalisch, Cracow (chief town, Miechow), Sandomir (capital, Radom), Lublin, Podlachia (capital, Siedlce), Plock, and Augustow (capital, Suwalki).

Constitution. The state received a constitution from the emperor Alexander, signed by him at Warsaw, Nov. 27, 1815. According to this, the executive power was vested in the king, but the exercise of it intrusted to a council of state, the governor and five ministers. The diet, which the king was to convene every other year, and whose session lasted thirty days, consisted, 1. of the chamber of the senate (thirty members, viz. ten bishops, ten waywodes, and ten castellans); 2. of the chamber of nuncios, in which seventy-seven nuncios, appointed by the seventy-seven assemblies of the nobles of the seventy-seven districts, and fifty-one deputies (from eight assemblies for the city of Warsaw, and forty-three for the rest of the country) as well as the members of the council of state, had a seat and vote. But in this chamber, the five ministers, and the members of the three committees, appointed by the chamber for financial, civil and criminal laws (the first of five members), could alone speak; the other nuncios voted by ballot. The diet examined the projects of laws, framed in the council of state. By this constitution, all Christian denominations enjoyed equal religious and political privileges; the freedom of the press was acknowledged, and all public officers, the members of the council of state, the ministers, &c., were made responsible. The archbishop of Warsaw was primate of the kingdom. The Polish diet was convened, for the first time for twenty-three years, in 1818, and again in 1820, 1825, and 1830.

History. This country, for a thousand years, has been remarkable for its miserable condition. Prior to 1772, this country, the most extensive plain in Europe, contained, with Lithuania, 284,000 square miles, supporting a population of at most 11,500,000 (according to Busching, 8,000,000 or 9,000,000) inhabitants, who, under 100,000 petty masters, derived as little benefit from the freedom of the republic as from the fertility of the soil. Corn and wheat, flax, wood, honey and wax, excellent horses, large herds of fine cattle, and an inexhaustible supply of salt, constituted the natural and commercial wealth of the country, which was easily conveyed to the Baltic and Black seas, by rivers abounding in fish; but, excepting in Warsaw, Bromberg, Posen, and some towns of the Silesian frontier, industry was torpid; the whip of the noble was the only stimulus of agriculture, and the Jew drowned in brandy all activity of mind; for the sentiment of the Polish serf is, "Only what I drink is mine." The least of the evils of the country was legions of wolves and other rapacious animals. In the great convulsions produced by the incursions of the Goths and Huns, and still more in its 200 years' struggles with the Germans, and in its internal troubles, this people (a branch of the Sarmatians of the river Borysthenes) acquired a most wonderful elasticity of character, compounded of pliancy and obstinacy, of submission and defiance, of servility and patriotic pride. The first Sclavonic tribes who, in the sixth century, expelled the old Finnish tribes, marched up the Dnieper, and followed down the course of the Vistula. Here they settled on one side, under the name of Lithuanians, and, on the other, around the shores of the Baltic, under those of Prussians and Lettians; they were followed, in the seventh century, by the Leches, another Sclavonic tribe. These last, more civilized than the other wild hordes, received Christianity about 960, and, at the same time, the art of writing, and, towards the end of the tenth century, were called Poles (i. e. Sclavonians of the plain). It was the fate of this new people to be continually at variance with its neighbours. In 840, those between the Vistula and Warta had been united under Piast, a prince of their own choice; but they were afterwards again divided into smaller principalities among his male heirs, so that there remained no other bond of union than affinity of origin, a common reigning family (the Piasts), and a common name. This unity, rather the result of opinion and feeling than of legal arrangements, had, however, a powerful influence on the imagination of the Poles, and inspired them with the most heroic patriotism. But, like all men destitute of legal order and freedom, and governed by their feelings, they abandoned themselves to every political excess, with equal thoughtlessness and passion. So far the body of the people may be called fickle, and without character; yet there has not been any want of distinguished men among them, who would have done honour to any republic. With youthful enthusiasm they combined manly energy and republican elevation. In the history of Poland, the names of Tarnoffski, Zamoyski, Zolkieffski, besides those of heroes and statesmen of later days, are immortal. Others, however, driven abroad by internal dissensions, betrayed their country to the enemy through blind party rage. Thus Poland, as a state, struggled with the fundamental evils of its constitution, till it fell under them. In this republic there existed no unity, although it received the name of one kingdom in 1025, under Boleslaus Chrobry. The tree of liberty stood without roots, till overthrown by the tempest. The elective franchise was unquestionably the cause of the turbulence of party. Legal order and civil liberty could not thrive because of the prevailing inequality of condition. The nobleman was the only citizen. To this rude, thousand-headed sovereign, its policy was by no means clear; still less did the Poles understand how to unite individual liberty with public power. The nation, therefore, lost one safeguard of its independence after another; first Silesia and the Oder, then the Baltic, the Dnieper, and finally the Carpathians. But a state which has no fixed boundaries, which is cut off from the sea, and which has not the strength of internal unity, will always be the prey of the ambitious policy of its neighbours. The misfortunes of Poland began when the Piasts divided the country among their sons. Boleslaus III., indeed, in 1138, conferred on the eldest, as the possessor of Cracow, a kind of superiority over the other princes; but this only increased the confusion. The arrogance of the hierarchy, and the inveterate hatred nourished between the Germans and Poles by 200 years of war, prevented even Christianity, which was introduced into Poland at the end of the tenth century, from having a beneficial influence on the state of the country. When, at a subsequent period, Conrad of Masovia called in the Teutonic knights against the Prussians, they conquered the Baltic seaboard, from the Oder to the gulf of Finland, between 1230—1404, and Poland lost its northern line of defence and maritime commerce. Ladislaus Lokietek, who was crowned in 1305 as king of Cracow, had indeed united Great Poland, on the Warta, with Little Poland, on the Upper Vistula, into one whole; but it was too late. The Germans were too powerful for the Polish state. His son Casimir, who on account of his wisdom as a legislator, and his exertions in civilizing the interior, was surnamed the Great, was compelled formerly to cede the Oder and Lower Vistula, in the peace of Kalisch, in 1343. This wise prince was more successful in establishing social order. He fortified the towns, and freed them from the oppressions of the nobility, but, on account of his love of a Jewess, conferred favours on her nation, which subsequently monopolized all trade, and impeded the national prosperity. With Casimir (in 1370), the male line of the Piasts became extinct. The nobility now began to barter their votes with the candidates for the throne, in exchange for personal privileges, which could be granted them only at the expense of the whole. The union of Poland with Hungary, under Louis (1370—82), was not, therefore, sufficient to confirm the monarchy. More natural, and therefore more permanent, was the union with Lithuania, in 1386; the Lithuanian grand-duke Jagellon having obtained the Polish crown by marriage and election. But difference of language and manners kept the Lithuanians separate from the Poles. Christianity, which the former now first embraced, was not a political bond, that could unite the two nations into one people; they were, however, now more powerful against their common enemy, the Teutonic knights. Poland seemed to recover its natural boundaries when, by the treaty of Thorn, in 1466, the knights ceded Culm and the Vistula, as far as Elbingen, to Poland, and acknowledged the suzerainty of the republic over the possessions of the order. Livonia, also, was annexed to Lithuania in 1558, and in 1561 Courland became a Polish fief; thus Poland, especially after 1569, when the Lithuanian nobility, with that of Great and Little Poland, constituted one diet, became the most powerful state in the north. But by the traffic which they carried on in the succession to the throne, the hereditary right to which they often contested with the Jagellons, the nobles acquired the entire representation of the nation, to the exclusion of the rest of the people. They appeared at the diets by nuncios, without whose consent (from 1505) no change could be made in the constitution of the state. From the native nobility alone the king could name the archbishops, bishops, waywodes, castellans, and ministers, who formed the first estate of the realm, or the senate in the diet. But the state still wanted a firm hand to keep the whole together. Smolensk, the bulwark of Poland on the Dnieper, was conquered, in 1514, by the Russians, and religious animosity raged in the country; but the dissidents (q. v.), or the Protestants, with the non-united Greeks (see *Greek Church*), obtained, at the diet of Wilna, in 1563, equal rights with the Catholics. The extinction of the Jagellon dynasty, however, in 1572, prevented this religious peace from being a blessing to the Poles. From this time, Poland continued an elective monarchy, till the adoption of the constitution of May 3, 1791. Henry of Anjou, the king-elect, swore to the first *pacta conventa*, as a sort of charter of privileges of the nobility. Thenceforward party hatred divided the leaders of the nobility, and family feuds called foreign arms into the country. Thus the Zamoiski party, which, by the election of the Swedish prince Sigismund, attempted to unite the two first crowns of the north, gave rise not only to domestic dissension, which was in a manner legitimated by the right of confederation and insurrection (belonging to the nobles since 1607), but also to bloody wars with Sweden, which finally gained a superiority over Poland, by the peace of Oliva (q. v.), in 1660. Sweden obtained Livonia, and the great elector of Brandenburg (in 1657) the sovereignty of Prussia. (See *Frederic William*.) At home all political connexion was dissolved in anarchy, when, in the reign of John Casimir (1648—69), the *liberum veto* was established by law, by which the vote of a single deputy could negative the resolution of all the rest. From the confederation there was but a step to political treason. Faction favoured the revolt of the Cossacks, who, in 1654, put themselves under Russian protection, after which Smolensk, Kiev, the Dnieper, and the part of the Ukraine beyond it, were ceded to Russia, in 1667, by the thirteen years' truce of Andrussow. King John Casimir at that time foretold with truth, in his speech to the diet (July 4, 1661), how, by whom, and why, Poland would one day be partitioned. The brave Sobieski ratified those cessions in the perpetual peace of 1686; on the other hand, Russia engaged to assist him in conquering Moldavia and Walachia. After his death, in 1696, the throne was sold to the highest bidder. (See *Polignac*.) When the elector of Saxony (see

Augustus II.) maintained a resistance to the French party, and attached himself to Peter of Russia, the republic, unable to defend itself, and considering the presence of the Saxon army dangerous to its freedom, was involved, by the unsteadiness and ambition of cardinal Radziecowski, in the northern war, which made Russia the first power in the north. (See *Northern War.*) The fate of Poland was now decided. Swedish arms accomplished in 1704, what the Russians achieved at a later period (1733—95). They disposed of the Polish throne. Corruption and luxury now made equal progress among the Polish nobility, and paralyzed and annihilated the strength of the nation. To fill up the measure of confusion, encroachments were made, in 1717, on the constitutional rights of the dissidents, which had been established for 150 years. The Jesuits blew up the flames, and their inquisitorial tribunal, established at Thoren in 1724, became the signal for mortal hatred. Finally, at the diets of 1733 and 1736, the dissidents were excluded from the office of deputy, from access to the courts of justice, and, in general, from all public offices; they were to be treated merely as the privileged Jews. In its moral tone, too, which aimed at uniting French wit and frivolousness with excess and rudeness, Poland went back many steps towards the times of violence. Thus every passion was thrown into a fatal ferment, when Catharine II. placed her favourite, the count Poniatowski, on the Polish throne. Too weak to check the rebellious pride of the nobility, he wavered between Russian protection and the dignity of an independent republic, till he finally lost the respect of all. The fanaticism with which Soltyk, bishop of Cracow, and Massalski, bishop of Wilna, opposed the restoration of religious freedom, was the main cause of the civil war, which plunged Poland into the wildest disorder, and accelerated the final ruin of the state. Russia embraced the cause of the dissidents; a general confederation was formed, but the diet was altogether under Russian influence. On the other hand, the confederacy of Bar was supported by France, and the war broke out with Russia. Foreign troops laid waste the country, and the lawless conduct of some of the Polish party chiefs excited, among the neighbouring powers, such a contempt of the natural rights of the Poles, that, to use the expression of Catharine, they deemed Poland a country in which it was only necessary to stoop to pick up something.

Such being the internal condition of the country, it seemed to the Austrian court a favourable opportunity to take possession of the towns of Zips, which had been mortgaged to Poland by Hungary, in 1402; and the dexterity of Kaunitz, the Austrian minister of state, finally induced the Petersburg, and this the Prussian cabinet, to meditate the partition of Poland. Von Dohm has shown, in his Memoirs (vol. i. p. 433 et seq.), in what manner the plan originated. This project has been, by some, ascribed to Prussia. Whoever must bear the guilt of starting this infamous scheme, the ignominy of all the three accomplices is sufficiently great. September 2, 1772, the Russian minister made known the resolution of the three powers, and September 18, 1773, the republic of Poland confirmed the treaty of partition, by which Poland lost 84,000 square miles. Austria obtained the county of Zips, the half of the Palatinate (waywodeship of Cracow), a part of the palatinate of Sandomir, the palatinate of Red Russia, the greater part of Belz, Pokutia, and a part of Podolia, countries which had formerly constituted the kingdoms of Galicia and Lodomeria, belonging to Hungary (27,000 square miles). Prussia received all Polish Prussia, with the exception of Dantzic and Thorn, and, in Great Poland, the district of Netz, which had formerly belonged to Pomerania, under the name of Pomerelia (13,375 square miles.) Russia received Polish Livonia, half the palatinate of Polotzk, the palatinates of Vitepsk, Mscislav, and a part of Minsk (42,000 square miles). Russia now decided the constitution of the unhappy republic. The Poles at last became aware of their true policy, and of their past folly. To secure their independence, encouraged by the promise of protection from Frederic William of Prussia, they undertook the formation of a new constitution. The elective monarchy was to be abolished, and the third estate to be received into the national representation. This was the basis of the constitution of May 3, 1791, to which Prussia gave its approbation. But Russia rejected it by the declaration of May 18, 1791, and espoused the cause of its opponents, who had concluded at Targowicz a confederation against the constitution which had been adopted by the diet. Prussia abandoned the cause of the republic, in the king's answer to the Poles, given June 8, 1792, through Lucchesini: the Polish republic, he said, had done wrong to adopt, without his knowledge and co-operation, a constitution which he had never intended to support. Prussia consented to a second partition, in 1793, by which Russia received 96,500 square miles, with 3,000,000 inhabitants (the remainder of the palatinates of Polotzk and Minsk, half the palatinates of Novgorod and Brzesc, the crown domains of Polish Ukraine, Podolia, and the eastern half of Volhynia); Prussia 22,500 square miles, with 1,136,000 inhabitants (the palatinates of Posen, Gnesen, Kalisch, Sieradc, Lenczic, and half Rawa, besides Dantzic and Thorn, half the palatinate Brzesc and of the district of Dobrzyn, together with the fortress of Czenstochow). Russian bayonets compelled the indignant members of the diet to acquiesce in this dismemberment of their country. The remnant of Poland was now under Russian guardianship. The heroic Kosciusko, in this situation of affairs, became the head of the confederates of Cracow, in March, 1794, and, in the holy contest for their country, Warsaw and Wilna were liberated. The battle of Raclawice, April 4, 1794, and the relief of Warsaw, which was besieged by the Prussian army, September 5 and 6, 1794, are the most glorious days in the history of the Polish nation. But it was too late: without fortresses, discipline, allies, or even arms; surrounded by Russians, Prussians, and Austrians—the convulsive efforts of national despair must have been unavailing after the battle of Macziewice, October 10, and after the fall of Praga, November 4, even if the Poles had acted with more unity, and had had more heroes like Kosciusko. In October, 1795, the whole country was divided between Russia (43,000 square miles, with 1,200,000 inhabitants), Prussia (21,000 square miles, with 1,000,000 inhabitants), and Austria (17,600 square miles, with 1,000,000 inhabitants) The last king lived at Petersburg, with a pension, and died there in 1798. To the Poles nothing remained but wounded feelings of national pride, a bitter hate against Russians and Germans, and fruitless appeals to French aid and public sympathy. Russia had robbed Poland of upwards of 180,000 square miles, and 4,600,000 inhabitants; Austria of about 45,000 square miles, with 5,000,000 inhabitants; Prussia of 57,000 square miles, with 2,550,000 inhabitants.

The dismembered country, which now first received internal order from foreign hands, continued in this condition till November, 1806, when Napoleon's victories led the emigrant Poles, under Dombrowski, to Posen and Warsaw. By the terms of the peace of Tilsit (July 9, 1807), the greater part of the Prussian Polish provinces was formed into the duchy of Warsaw, which received a German ruler in the king of Saxony, and at the same time with the French code, a constitution similar to the French, by which bondage was abolished. Dantzic was to have been a republic, under the protection of Prussia and Saxony, but remained a French place of arms. The dotations (q. v.) bestowed on the French officers, and still more the continental system which destroyed all trade, exhausted the public revenues, so that Poland, amid all its natural wealth, experienced the fate of Tantalus. The necessity of furnishing troops for the French service, was also a check on the prosperity of the new state, and annihilated all that Prussia had effected at great sacrifices. Yet the woollen and cotton manufactures, that had grown up in Posen and Broomberg, sustained themselves. The government of the duchy did every thing practicable under such unfavourable circumstances. The war between France and Austria, in 1809, augmented, indeed, the sufferings of the country, but developed, to an extraordinary degree, the military energies of the people. Under the command of Poniatowski and French officers, the Polish troops rivalled the best troops of France in valour. They advanced to Cracow, and the peace of Vienna (Oct. 14, 1809) annexed Western Galicia to the duchy of Warsaw, which had hitherto contained 39,000 square miles, with 2,200,000 inhabitants; so that it now comprised 60,000 square miles, with 3,780,000 inhabitants, and furnished a well-equipped army of 60,000 men, which fought in Spain with great bravery. Under these circumstances, the old national pride revived; their former boundaries, a native king, and the restoration of the name of Poland, were the unanimous wish of the nation. On this wish, which he artfully encouraged, Napoleon founded his plan of attack upon Russia, in 1812, which he styled the second Polish war. He contrived that a general Polish confederation, in Warsaw (June 28, 1812), should solemnly proclaim the restoration of Poland; but the ardour was not universal. The exertions of the duchy, which raised upwards of 80,000 men, were, for the most part, rendered useless by Napoleon's method of waging war. Tormassoff kept the Lithuanians in check, and, instead of the "16,000,000 Poles," whom Napoleon boasted that he should find on horseback at his command, only a few battalions of volunteers assembled. A brave resistance was, nevertheless, offered by the fortresses Zamosc, Modlin and Thorn, which, however, were partially garrisoned by French and German troops. The sufferings of Poland, in this war of restoration, and the manner in which Napoleon counterworked his own plans, may be learned from De Pradt, archbishop of Malines, who was his ambassador in Warsaw (*Histoire de l'Ambassade dans le Grand Duché de Varsovie, en* 1812; Paris, 1815, 8th edit.). The Polish bands followed the defeated emperor to France; a part even to Elba.

Meanwhile Russia assumed the administration of the whole duchy. Dantzic, with its territory, reverted to Prussia, and the congress at Vienna (in May, 1815) decided the fate of the country. 1. The city of Cracow, with its territory (466 square miles, 96,000 inhabitants, and a revenue of 250,000 dollars [thalers]), was to be governed by its own laws, as a free and independent republic; 2. the country on the right bank of the Vistula, with the circle of Tarnopola, which had been ceded to Russia by the peace of Vienna, was restored to Austria; 3. the circles of Culm and Michelau, the city of Thorn and its territory, the department of Posen, with the exception of the circles of Powitz and Peysern, and part of the department of Kalisch, as far as the Prosna, excluding the city and circle of that name (these limits were more exactly defined by the boundary-treaty between Russia and Prussia of Nov. 11, 1817), were ceded to the king of Prussia, who united Dantzic, Thorn, Culm and Michelau with West Prussia, and from the remainder (11,400 square miles, with 847,000 inhabitants) formed the grand-duchy of Posen, and appointed prince Radziwill governor; 4. all the rest was united with the Russian empire, under the name of the kingdom of Poland, but with a separate administration, and such a territorial extent as the Russian emperor should see fit. The emperor Alexander, therefore, assumed the title of czar and king of Poland, and received homage in Warsaw. Poland, though thus divided, preserved its name and language, as the treaties of Vienna secured to all Poles, who were subjects of either of the three powers, such an organization as tended to maintain their national existence. A Polish charter was accordingly promulgated (Nov. 27, 1815), consisting of one hundred and sixty-five articles, which, if faithfully executed, would have promoted the welfare of Poland. The government of the country was to be vested in a native Pole, as lieutenant of the kingdom, unless one of the imperial princes should be appointed viceroy. This was rendered nugatory by the presence of the tyrannical Constantine, as commander-in-chief. Equality of religious sects, personal security, liberty of the press, the entire possession of all employments, civil and military, in the country, by Poles, were among the promises of the charter; and these rights were to be secured by a national diet, composed of two chambers. But these promises were kept only to the ear; restrictions on the press, arbitrary imprisonment, arbitrary and cruel punishments, insults added to injuries, a solemn mockery of a diet, which was not allowed to exercise any real authority; the violation of every article of the charter by a Russian barbarian; peculation and extortion practised by the inferior officers;—these were some of the features of the Russian government of Poland.

The first diet was assembled in 1818, and the liberty of the press was abolished by an act of 1819. Another diet was held in 1820, but these meetings were rendered mere ceremonies; they had no freedom of debate, for those members who dared to express opinions unpalatable to the government were banished to their estates, and made to pay the troops that guarded them; it could not refuse supplies; and, in 1825, an ordinance was issued by the government, abolishing publicity of debate. The resources were squandered to maintain a Russian and Polish army, and Russian governors practised all sorts of extortion; state prisoners were sent into Russia, and imprisoned without trial; respectable citizens were flogged or made to work in the highways without any charge being specified against them. On the death of Alexander (December, 1825) and the accession of Nicholas, a conspiracy broke out in Russia, and, on pretence that it extended to Warsaw, several hundred persons were arrested in Poland, and a commission constituted, contrary to the provisions of the charter, to inquire into the affair. The only discovery of this inquisitorial tribunal was, that secret societies had existed in Poland since 1821. In May, 1829, Nicholas was crowned at Warsaw. In 1828, however, a secret society had been instituted, for the purpose of gaining over the officers of the army to the cause of independence; and to their agency is the insurrection of 1830 to be attributed. It appears, nevertheless, that it was immediately occasioned by a sham conspiracy got up by the Russian police, who had thus induced a number of young men to betray themselves, and crowded the prisons with the victims. Not only the Polish officers, the youth of the military school, and the students, had been gained over to the cause of the patriots; but the greater part of the citizens, and the chief nobles, were ready to encourage an effort to save themselves from what they now foresaw—the occupation of Poland by a Russian army, and the marching of the Polish troops to the south of Europe.

Such was the state of things when the insurrection at Warsaw broke out, Nov. 19, 1830. A young officer entered the military school, on the evening of that day, and called the youth to arms. They immediately proceeded to Belvidere, the residence of Constantine, about two miles from the city, for the purpose of seizing his person. They were joined, on the way, by the students of the university, and forced their way into the palace; but the prince was concealed in a clothes-press, by a servant, until he could make his escape by a secret door. Another party of cadets and students paraded the streets, calling the citizens to arms, and they were joined by the Polish troops. The arsenal was seized, with 40,000 stand of arms, and the insurrection now became general. On the next morning, 40,000 troops and citizens were in arms, and the Russians were expelled from Warsaw. The administrative council was summoned to preserve order, and, to give more influence to its measures, several of the most distinguished Poles were invited to sit with it. Measures were taken for the organization of a national guard, and of a new police and municipal government. December 3, the prince was allowed to leave the neighbourhood of Warsaw, with three regiments of Russian cavalry, and two regiments of infantry, without opposition. On the 5th, general Clopicki was proclaimed dictator till the meeting of the diet, which was convoked for the 18th. Meanwhile Nicholas issued a proclamation (December 17), in which he declared that no concessions could be made to the rebels, and, on the 24th, another, addressed to the Russians, telling them that the Poles had dared to propose conditions to their *legitimate* master: "God," he adds, "is with us, and, in a single battle, we shall be able to reduce to submission these disturbers of the peace." January 24, the Polish diet, which had been opened on the 18th of December, declared the absolute independence of Poland, and the termination of the Russian dominion, and, on the 25th, that the Polish throne was vacant. The account of the war which followed, and of the disposition made of Poland, will fall under the article *Russia*.

An excellent work respecting Poland, though written with an evident hatred of Catharine and Poniatowski, is Rulhière's *Histoire de l'Anarchie de Pologne et du Démembrement de cette République* (4 vols., Paris, 1807). Respecting the first partition of Poland, see Von Dohm's *Denkwurdigkeiten* (1 vol.), and *Lettres du Baron de Vioménil* (Paris, 1808), and Malte Brun's *Tableau de la Pologne ancienne et moderne*, of which a new edition has recently been published. Consult also Jekel's historical and statistical works on Poland and Galicia (Vienna, 1804—9); Flatt's *Topographie des Herzogthums Warschau* (Leipsic, 1810); and Von Holsche's *Geographie und Statistik von West-Sud-und Neuostpreussen* (Berlin, 1807). Three works in the Polish language are deserving of recommendation—Y. S. Bandtke's Affairs of the Polish Nation (Breslau, 1826), Ad. Naruscewitsch's History of the Poles, and Jul. Urs. Niemcewicz's Reminiscences of ancient Poland (Warsaw, 1822). To these may be added Alex. v. Bronikowski's History of Poland (4 vols., Dresden, 1827); Salvandy's *Hist de Pologne, avant et sous J. Sobieski* (Paris, 1829); Fletcher's History of Poland (8vo, London, 1831). Much information, especially respecting the period of 1794—98, is contained in Mich. Oginski's *Mémoires sur la Pologne et les Polonais depuis* 1788—1815 (Paris, 1826, 4 vols.); and the same author's *Observations sur la Pologne et les Polonais pour servir d'Introduction aux Mémoires, etc.* (Paris, 1827.)

Polish Language. The uncertainty of the earliest Polish history spreads a deep obscurity over the rise and progress of the language. It is of Sclavonic origin, as its whole structure proves, but borrowed, from the people who had previously inhabited the country, such a multitude of hard consonants, that it differs very much in this respect from its eastern sister, the Russian language. The cultivation of the language early met with a great obstacle on account of the adoption of Christianity, according to the Latin ritual in 965; for the clergy, being the most cultivated order, took possession of the places of honour and the public offices, so that the Latin language became the language of the state, and afterwards, on account of the kings and queens being foreigners, the language of the court, and of all the educated classes also. The language of the country first recovered its rights in the reign of Sigismund, in the sixteenth century, and became, in the middle of that century, the language of books; it then declined in the seventeenth, but flourished again during the reign of Stanislaus Augustus, and ripened to a maturity of which even the subsequent political changes could not entirely deprive it. In 1801, a society for the preservation of the purity of the Polish language was formed at Warsaw, under the direction of the bishop Abbertrandi, and, in 1802, published the first volume of their transactions. The language can appear harsh and rough only to those who are unacquainted with it; notwithstanding the multiplicity of consonants, it is superior in harmony and flexibility to the other Sclavonic dialects. Of the grammars, after that by the Piarist Copczynski, the following may be recommended: that by Mongrovius (3d edition, Dantzic, 1827), and Vater (Halle, 1807), particularly that by George Bandtke (a new edition, Breslau, 1824), and the First Principles of the Polish Language, by Meozinski (Warsaw, 1822). Of dictionaries, that by Bandtke (Breslau, 1806), and the great one by Linde, are the most valuable. The latter is in six quarto volumes.

Polish Literature. Although the marriage of Miecislaw with Dombrowka, the daughter of the king of Bohemia, led to the introduction of Christianity into Poland, in 965, the continual domestic and foreign wars prevented this event from producing any favourable effect on the civilization of the country. The political literature begins, in the twelfth century, with the chronicles of the country, written in Latin by Mart. Gallus (about 1109), Nicholas Kadlubek (died in 1223), and Boguphalus (died 1255), and the chronicle of the popes and German emperors by Mart. Strzempski, or Polonius (died in 1279). A new edition of Vincent Kadlubeck's *Res gestæ Principum ac Regum Poloniæ* appeared at Warsaw in 1824, together with Dziersswan's *Chronicon Polonorum* (of the thirteenth century). After a long cessation, Casimir III., or the Great, who reigned from 1333 to 1370, improved the state of things. He not only built many cities, but, in 1347, drew up a code of laws, first held the diets, encouraged agriculture and manufactures, and founded, in 1347, the university of Cracow, which was revived in 1400, but was not in a flourishing condition till the sixteenth century. The seed sown by him ripened slowly and silently, and the progress of cultivation first became apparent in Joh. Dlugosa's (bishop of Lemberg) Polish history (he died in 1480), which was rich in materials and in documents. The first Polish printing-press was established at Cracow, in 1488. (See Bentkowski, *On the oldest printed Works in Poland*, Warsaw, 1812, and Bandtke's *History of the Cracow Printing-presses.*) Under the prosperous reigns of the two Sigismunds, from 1507 to 1572, the proper national literature began, which, in a remarkably short time, made a wonderful progress. The reformation, which met with the silent favour of government, and found so many adherents, that even the Socinians were tolerated, contributed to increase freedom of thought. Under the vigorous reign of Stephen Bathory, from 1576 to 1586, the literary activity did not cease, and in the following reigns the royal general, Joh. Zamoyski, effected much by the establishment of institutions, and by his own example. But he was the last active promoter of the national culture, and it was owing to him that it did not decline under the feeble reign of the Swedish Sigismund, and the injurious influence which the zealous and ambitious Jesuits exerted on freedom of thought and of the press. That it did not rise higher, is to be attributed to the unhappy fate of the country, distracted by party violences, so that even its national existence was frequently endangered. Under the Saxon princes, literature was not in a more promising condition; but it flourished more under the wise administration of the accomplished Stanislaus Poniatowski, and attained, during his reign, such a vigour, that even the subsequent storms, in the course of which Poland was erased from the list of states, were not able to destroy it.

The Polish literature is not very valuable in a scientific point of view, though it has produced many excellent works in this department; but its greatest interest is owing to its pure nationality, of which the literature of few nations can boast in the same degree. At no period did the bold and aspiring national spirit of this active people fail, however full of foreign usurpation the history of Poland may be. The literature always continued to advance with the state of society, and turned mostly on those points which are of the highest interest in the relations of a state. Hence the almost total absence of philosophers and mathematicians (the astronomers Copernicus, and Pockzobut, Joh. Sniadecki, and the natural philosophers, Rogalinski and Jos. Sosinski, excepted); hence also, on the other side, the abundance of national historians and of lofty poets praising the exploits of their ancestors, or lamenting the present state of their country. In works of mere fiction they met with less success: still the Poles successfully transferred to their own language the productions of other nations. The ex-Jesuit Ign. Nagurczweski translated the Iliad, Virgil's Eclogues, and other writings of antiquity; the excellent critic Francis Dmochowski translated, in noble flowing language and easy versification, the Iliad (Warsaw, 1800, 3 vols.); and there is another translation of this poem, together with the Odyssey, by Przybylski; Pet. Kochanowski translated Tasso's Jerusalem (Cracow, 1687; edited by Czayowski, professor of Polish literature at the university of Cracow, Breslau, 1825); Krasicki, Tymieniecki and Brodzinski translated Ossian; Joh. Kochanowski, and afterwards Naruscewicz, Horace. The latter, in a masterly manner, and perfectly in the spirit of the original, translated Tacitus; and Karpinski, the *Jardins* of Delille. The historians who deserve mention are, Stryikowski (author of the Lithuanian Chronicle, from the best sources), Stanislaus Orzechowski, Mart. Cromer, Joh. Demetr. Sulikowski, Stanislaus Kobielzycki (who wrote a history of Wladislaus IV., in classical Latin), the spirited Piasecki, the impartial Vespasian Kochowski, and, above all, the celebrated Jesuit Naruszewicz, distinguished alike for deep research, critical acuteness, and the excellence of his manner. The latter began the general history of the Poles, the continuation of which several members of the royal Warsaw society of sciences undertook in the name of the society. Niemcewicz esteemed as a statesman, a warrior and a poet, has published national historical songs (with engravings and music, 1815), with historical illustrations. Count Potocki has distinguished himself by his history of the fine arts in his *Polish Winckelmann* (Warsaw, 1816, 4 vols.), by his Rhetoric, and by his Political and Occasional Speeches (Warsaw, 1815, 5 vols.) Count Seb. Sierakowski has published a splendid work on architecture; Bratymowicz, well known for his services in draining the marshes in the vicinity of Pinsk, and for his plan for the union of the navigable rivers of Poland, a work on agriculture. Barth. Paprocki, Okolski, and Casp. Niesiecki, who is not sufficiently valued by many, have published important works on genealogy and heraldry. Stanislaus Konarski is distinguished as a writer on politics and education, and Andr. Zamoyski (1777), as the author of a Polish code of laws, which was unwisely rejected by the diet, that had caused it to be drawn up. Kluk, Ladowski, and Jundzill wrote on natural history.

The oldest and finest monument of Polish poetry is the works of Joh. Kochanowski (born in 1550, and died in 1584), which are distinguished for their pure and noble style, beauty of versification, delicacy and feeling. They consist of a translation of the Psalms, a didactic poem on chess, songs, elegies, and epigrams. Sim. Simonowicz is still a model in the idyl, and Stanislaus Grochowski in sentimental lyric poetry. Vespasian Kochowski and Joh. Twardowski, in the seventeenth century, are not remarkable for taste, but the latter is distinguished for his fire. Of the moderns, Stanislaus Trembecki, Francis Kniaznin, Francis Zablocki, Kajetan Wengierski, Valer. Gorski, Francis Wenzyk, Dysma Tomaszewski, the animated Kajet. Kozmian, Tymowski, Louis Osinski, Rekelewski, the fiery Kasim. Brodzinski, the tasteful Joh. Kruszynski, the epigrammatic and flowing, but incorrect Ant. Gorecki, the correct Alois Felinski, Francis Marawski, the national and Pindaric Joh. Woronicz, deserve to be mentioned. Franzisczek Karpinski is esteemed for his noble and pure language and deep and tender feeling (Lyric and Elegiac Poems, Warsaw, 1790, 2 vols.) The great, but unhappy king Stanislaus Leczynski also composed with success. But the prince-bishop Ignatius Krasicki (q. v.), who died in 1802, is the only writer who is classic both as a poet and prose writer: he is also a witty satirist, the only original epic poet (*Woyna Chocimska*) of the Poles, and the translator of Ossian. In 1817, Dyrma Tomascewski published a heroic poem in 12 cantos, under the title *Jagellonida* (the Union of Lithuania with Poland). (See Bowring's *Specimens of the Polish Poets.)* The literature of Poland is rich in popular songs (*Salanki Polske*, Warsaw, 1778), and also in dramatic works, of which the most celebrated are those of Jos. Bielawski, Francis Zablocki, Jos. Kossakowski, Niemcewicz, Drozdowski, Louis Dmuscewski, Francis Wenzyk, Felinski, Louis Osinski, Alb. Boguslawski, Ant. Hoffman, &c. The dramatic works written between 1770 and 1794 are mostly contained in a collection (*Teatr Polski*, Warsaw, 1778, seq., 56 vols.) As pulpit orators, Lachowski and Wyrwicz are known even in foreign countries by translations.

In general, the old Polish authors, particularly of the time of Sigismund Augustus and Stephen Bathory, are still the classical models of the Polish style, although great changes took place in the Polish language in the eighteenth century. Joh. Kochanowski, Skarga, Wuiek, Bialobrzeski, Gornicki, Stanislaus Grochowski, Seb. Petrycy, Joh. Januszowski, Cyprian Bazylik, Mart. Blazowski, Mart. Bielski, and others, are yet esteemed as classics. Of the modern classical prose writers of Poland may be mentioned Ignatius Krasicki, a model of ease and nature, Joh. Sniadecki, Naruszewicz, Skrzetuski, Jodlowski, Czacki, Louis Osinski, Stanislaus Potocki, Albertrandi, Karpinski, Dmochowski, Alb. Sweykowski, and others. The work which appeared at Warsaw, in several volumes, entitled *Wybor Pisar's zow Polskich*, contains a selection from the classical authors of Poland. The royal society of the Friends of Science at Warsaw has rendered important services to Polish literature. It has published several volumes of transactions. In 1815, three literary journals in the Polish language were published at Warsaw, Wilna and Lemberg. In 1818, there were six.—See *Letters, Literary and Political, on Poland* (Edinburgh, 1823.)

The Polish nobility were never strangers to literature; and of late years the spirit has spread to the other citizens, and both within the limits of what now constitutes the kingdom, and in all the countries formerly belonging to it, a literary activity has prevailed since the general peace in Europe, in 1815, assisted by learned societies, and periodical publications and journals, whose wings, indeed, have been clipped by an arbitrary censorship. Warsaw, Wilna, Cracow, Lemberg, Posen and Breslau have been the central points of intelligence. Learned inquirers have, in the most recent periods, laboured to develop the Polish language, and to purify it from the foreign terms with which it has been overloaded. A literary history of all the Sclavonic nations was undertaken, some years since, by Linde, at Warsaw, assisted by many scholars of distinction. Endeavours have been made to collect the historical documents of former times, which are still in existence, and to obtain better editions of the old original authors. A new edition, in two volumes, of Bandtke's History of Poland, in the Polish language, appeared at Cracow and Warsaw in 1822. Surowiecki, who died in 1827, distinguished himself by his historical and statistical writings, as well as Michael Oginski, by his Memoirs of Poland, in the French language. Efforts have been made also to collect works of art illustrative of Polish history, and the episcopal palace at Cracow has been converted into a museum for such monuments. The *Monumenta Regum Poloniæ Cracoviensia* has been published in numbers, at Warsaw, commencing in 1822, and consisting of engravings, illustrated by a text in Polish, Latin, and French. The Polish nation has erected to the hero Kosciusko, at Cracow, a monument of stupendous proportions, and after the old Sarmatian fashion, consisting of a hill 120 feet high, and about 280 in diameter at base. The rich nobles of Poland have never been deficient in a love for making collections. Count Stanislaus Potocki, while he superintended the department of public instruction, from 1803 to 1821, set the example of throwing open these collections to the public use; and a library, which owes its present consequence principally to Linde, who collected, in 1819, from the suppressed monasteries, 40,000 volumes, including many very valuable works, offers important means of study, which have been diligently improved by the people.

Among the authors who are the favourites of the nation, and have gained the most decided influence, are Fz. Karpinski (who died in 1820); Trembecki (who died in 1812), distinguished as a lyric poet, fabulist, didactic poet and epistolary writer; Stanislaus Zachowitsch, for his Fables and Tales (2d edit. 1826, at Warsaw). Still higher stands Julius Niemcewicz, whose patriotic historical songs have become the possession of the people (Warsaw, 1816 and 1821). A dramatic work of general Boguslawski, *Krakowiani i Gorali* (Warsaw, 1823), is interesting for the number of its patriotic songs. The dramatic works of count F. Wezyk (National Historical Tragedies, Cracow, 1823), and the nine comedies of count Alex. Fredro (in Polish, Vienna, 1826, 2 vols.), deserve mention. There are Polish romances by count Frederic Skarbeck. J. U. Niemcewicz has imitated Sir Walter Scott in his historical romance *Jan. Y. Tenczyna* (Warsaw, 1827, 3 vols.) The exact and experimental sciences, also, have not been neglected of late years. Arnold, at Warsaw, is devoted to the literature of natural history. Botany appears not to have attracted, as yet, the interest which the unexplored treasures of the vegetable kingdom of Poland deserve. Of medical treatises there are not a few, though the influence of foreign models is generally apparent in them. Societies are active for the advancement of agriculture. Gardening has received the attention of men of high standing; and the president of the senate of Cracow, Stan. Wodzicki, has written a treatise to make his countrymen acquainted with the trees and shrubs which will endure the climate of the country. Works upon jurisprudence have been written by Macieiowski, Budny and Senwicki. The present university of Warsaw arose from the law school founded by count Lubienski. With respect to the historical literature of Poland, we refer particularly to the *Revue Encyclopédique* (Oct. 1827).

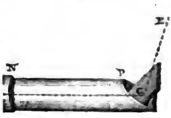
POLAR BEAR. See *Bear*.

POLAR EXPEDITIONS. See *North Pole, Expeditions to. Variation.*

POLARITY. See *Electricity*, and *Magnetism*.

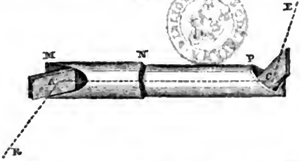
POLARIZATION OF LIGHT. In our article *Optics*, we have considered the primary laws of the refraction, reflection, and inflection of light, but in that article the refracting or reflecting surface was supposed to be homogeneous, or uniform in structure, and not crystalized. It has been found, however, that light suffers peculiar change, when refracted or reflected under particular circumstances, and that these cannot be accounted for by the ordinary principles of optical science. In order to make the reader acquainted with the origin of this new branch of the doctrine of light, we will describe a simple experiment. Let there be a tube N P open at both ends, and let there be a mirror C inclined at the one end, so that a ray of light from some luminous object beyond N may pass through the tube, and be reflected by the mirror C to the eye at E. Let now the tube be turned round on its axis, it will be found that the reflection from the mirror, which turns with it, is equally intense,

Fig. 1.



whether the mirror reflect the ray C E upwards, downwards, sideways, or obliquely. No alteration, in short, has taken place in the reflected light, excepting in the changes of its direction—changes which are accounted for on the ordinary laws of optical science. But if to the extremity N of this tube we attach another (fig. 2.) N M somewhat greater in diameter, and affix to the end of M another mirror A, so that a ray of light R A may fall upon it from a luminous object R, at an angle of incidence equal to 56°, and this reflected ray pass through the tubes in the direction A C, and be reflected from the second mirror C to the eye at E, also at an angle equal to 56°; then will we find that, by causing the mirror C to turn round on the axis of the tube, some singular phenomena will take place, not to be accounted for by the ordinary principles explanatory of the reflection of light.

Fig. 2.



These adjustments being made, place the apparatus so that the plane of the mirror A is perpendicular to the horizon, wherefore, the reflected ray A C will be reflected in a horizontal direction, as represented in the figure; then the tube N P being turned, so that the ray C E, reflected from the mirror C, shall be in the plane perpendicular to the horizon, it will be found that the reflected image from the mirror C, as seen at E, is very faint; in fact, that, to all appearance, there has been a great loss of light by the reflection. Let the tube M N be in the same position, as also the mirror A, but turn round the smaller tube N P, until the reflected ray, from the mirror C, is not, as formerly, perpendicular, but horizontal, or, in other words, at right angles to the plane of the ray C E, the tube N P having made one quarter of a turn. During the turning of the tube N P, it will be found that the reflected image from the surface C, gets gradually more strong, until the tube has been turned round one quarter of an entire revolution from the position in which it was first placed. Let the process of turning be continued until the smaller tube has performed a half round; the observer will find that from the beginning to the end of this second quarter turn, the reflected image from the mirror C has gradually diminished in intensity, and that at the end it has become as faint as it was at the beginning of the experiment. Continuing the same process of turning the smaller tube in the same direction, the intensity of the image will increase from the beginning to the end of the third quarter turn, when it will be as bright as at the end of the first, and continuing to turn the tube, the intensity will diminish until the tube arrives at its first position, and the light will be as dim as at the end of the second quarter turn. We thus see that the reflected ray from the reflector C is least intense when in the plane of the perpendicular to the horizon, and most intense when in the plane parallel to the horizon.

In the course of this experiment, the same ray A C has been reflected, but the intensity of the reflected ray varied with the position of the mirror C, and since the luminous object R and the mirror A have remained in the same position, it follows from the forementioned results, that the upper and under sides of the ray A C have scarcely been acted on at all by the reflector C, and that the horizontal sides have been acted upon more powerfully than any other portions of the circumference of the ray. Therefore, we infer that the ray A C has properties entirely different from the ray of common light R A, from which it has been obtained by reflection from a glass mirror A, the plane of which is at an angle of 56°, with the incident ray R A of common light. The inference to be drawn from this is, that common light, when reflected from glass at an angle of 56°, acts more powerfully in one direction than another, or, in other words, becomes *polarized*.

The discovery of this singular property of light is due to M. Malus, who, at an early period of life devoted his attention to the study of optical science, a study which was for a time interrupted by his service in the French army. In the summer of 1809, after his return from foreign service, he resumed his favourite studies, and made frequent visits to the observatory of Paris. In one of these visits his attention was arrested by the brilliant reflection of the setting sun, from one of the windows of Luxemburg palace. With a view of determining the effect of *double refraction* (q. v.) on this reflected light, he viewed it through a prism of *quartz*, and, on turning it round, he was surprised to find that one of the images resulting from the double refraction, changed gradually from brightness to obscurity. He repeated the experiment under various circumstances, and found that light reflected from glass at a certain angle had properties similar to the extraordinary ray in cases of double refraction. Extending his observations, he found the polarizing property in other reflecting surfaces, as water, marble, ebony, &c., each substance, however, having a particular angle of incidence necessary to polarization.

This amiable and eminent philosopher was prosecuting his experiments with great success, when death put an end to his brilliant career, in the prime of life, by a lingering disease, in February, 1812. The new field of science which Malus thus opened, has been since farther explored by the philosophers of our own country, as also of the continent. Among the continental philosophers, who have more particularly directed their labours to this subject, we may more especially mention M. M. Biot, Arago, and Freznel, and among the men of science of our own country, the names of Sir David Brewster and Sir J. E. Herschel, stand deservedly conspicuous. Notwithstanding all the researches of these able scientific men, a great deal yet remains to be done ere the doctrine of the polarization of light, as also the doctrine of double refraction, reach that precision and simplicity which characterise elementary optics.

The knowledge hitherto obtained in this interesting department of the science of light, is in a great measure embodied in mathematical formulæ, many of which are complex, and altogether unsuited to a work like the present. We will endeavour to make the leading and more interesting results known to the reader in a more popular form than would be pardonable in a systematic treatise on the subject.

By observation the polarizing angles for many substances have been found; for example, the polarizing angles of the undermentioned substances are as follow:—

Air,	45° or 47°
Water,	53° — 14°
Crown Glass,	56° — 12°
Rock Crystal,	57° — 22°
Iceland Spar,	58° — 51°
Glass of Antimony,	64° — 45°
Diamond,	67° — 13°

That polarization will only take place at these angles may be proven by a very simple modification of the experiment detailed in describing the apparatus, fig. 2, a modification first pointed out by Sir D. Brewster. Let the apparatus, fig. 2, be in the position represented in the engraving, that is, with the mirror C placed at the polarizing angle for glass, i. e. 56°, as stated before, the image will not be seen when the plane of the ray C E is perpendicular to the horizon, and consequently no image will be seen by the eye at E. Let us now breathe gently upon the glass C, so as to cover it with a thin film of water; the image of the luminous object R will now be seen at E, for the ray A C is now no longer reflected from the glass C, but from the surface of the film of water upon it, and the polarising angle of water in 53° 14′; but from the position of the glass C it is at 56°, and, therefore, the light will not be polarized, but turn it round, so that C with its film of water stand at an angle of 53° 14′ to the glass A, and the light will be invisible to the eye at E.

It is a curious and beautiful law discovered by Sir D. Brewster that the index of refraction for any transparent body is the tangent of its angle of polarization; so that the index of refraction being given, the angle of polarization may easily be found by turning up the index of refraction in a table of natural tangents, the corresponding angle will be the angle of polarization. From this law several important deductions may be drawn, as, the complement of the polarizing angle (i. e. what it wants of 90°) is equal to the angle of refraction—at the polarising angle the sum of the angles of incidence and refraction is a right angle: and when a ray is polarized by reflection, the reflected ray forms a right angle with the refracted ray. The converse of the same law is extremely useful in determining the refractive powers of bodies which are not transparent, for we have only to find the angle of complete polarization, and, taking its tangent we have the index of refraction. From this law the attentive reader will easily perceive that another important deduction may be drawn, which is, that since differently coloured rays have different angles of refraction, they must also have different angles of polarization; hence when the blue light becomes polarized, the red light still appears. In *oil of cassia* the phenomena illustrative of this are very conspicuous, and the following statement of the polarizing angles for the mean and extreme rays of the spectrum in that substance, as also in glass and water, will show the truth of the inference we have drawn from the general law.

	OIL OF CASSIA.	
	Polarizing angle	
Red,	59°	57′
Violet,	59°	39′
Mean,	58°	39′
	PLATE GLASS.	
Red,	56°	36′
Violet,	57°	35′
Mean,	57°	43′
	WATER.	
Red,	53°	4′
Violet,	53°	19′
Mean,	53°	11′

Thus in oil of cassia the difference of the polarizing angles for the extreme rays of the spectrum is 1° 24′, for plate glass 19′, and for water 15′. From what has been said above it is to be inferred that in any body there is only one angle at which incident light becomes polarized by reflection, yet by successive reflections light may be polarized at any angle of incidence. Thus Sir D. Brewster in experimenting with glass, whose refractive index was 1.525, gives the following results, among others.

No. of Reflections.	Angle of Polarization.
1	56° 45′
5	69° 1′
10	73° 4′
100	81° 57′
1000	86° 15′

when the angle of incidence is greater than 56° 45′; and

1	56° 45′
5	41° 43′
10	35° 18′
100	18° 11′
1000	8° 46′

where the incident angle is less than 56° 45′. A similar law holds with the separating surfaces of water and glass, nor is it necessary that the successive reflections be all made at the same angle.

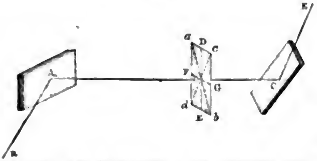
Sir D. Brewster discovered that the force which produces refraction extends beyond that which produces reflection, and that after refraction light is polarized in every body at an angle of 45°, and when a ray of light is incident at the polarizing angle, upon any transparent body, the whole of the reflected ray is polarized, and a nearly equal portion of the transmitted ray is polarized in a plane at right angles to the polarization of the reflected ray.

In experimenting on polarization, there are two different kinds of apparatus employed—the one for procuring and the other for analyzing polarized light. Polarized light may be obtained by reflection from a single plate of glass or other material, but the substance should have a low dispersive power; if glass be chosen, annealed crown plate glass will answer best. When a great deal of light is required, six, twelve, or more plates of annealed crown glass must be placed together, and cemented at the edge, and having been previously well cleaned, the light reflected from, or transmitted through these plates may be used, but if these plates cannot be obtained, thin films of blown glass may be employed, placed in a trough between two plates of the thinnest glass. One of the most powerful means that can be employed of obtaining polarized light, is by taking a piece of clear mica, and cutting it into the form of a right-angled parallelogram, whose sides are parallel and perpendicular to the plane of the resultant axis. (See *Refraction, Double*). Take now the mica, and put it in a vice, and with a very thin-bladed knife separate ten, twelve, or more of the laminæ, when the edges must be cemented, so that the laminæ may not alter their positions. Polarized light may also be obtained from doubly refracting crystals of great thickness, from prisms of Iceland spar doubly refracting, and also from single image prisms of the same substance, agate and tourmaline.

Some of the most singular and beautiful phenomena in the whole of the physical sciences, are exhibited in the colours arising from the action of crystals on polarized light. This, which by a judge has been pronounced to be at once "one of the most important, as well as one of the most complete, branches of optical knowledge," derived its origin from the independent researches of M. Arago and Sir D. Brewster—researches which have been successfully followed up by M. Biot, Dr Young, M. Mitscherlich, M. Fresnel, and Sir J. E. Herschel. One of the simplest methods of observing the phenomena to which we now allude is as follows.

Let there be two plates A C, fig. 3, placed in the same relative position, both to themselves and the incident ray A R, as described in the experiment with the apparatus, fig. 2.

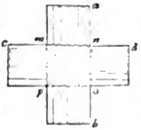
Fig. 3.



Here we will denominate A the polarizing plate, because it is placed at the proper angle for polarizing the light, C we will call the analyzing plate, because it refuses to reflect the light which is polarized, but reflects that which is not polarized. For all ordinary purposes the light of the sky will answer, and the glasses may be adjusted by examining the plate C, from the point E, and observing when a dark spot in the image of the part of the sky reflected by A becomes most distinctly dark, and if a large quantity of polarized light be required, a bundle of plates, as before described, ought to be employed, instead of the single plate A. These adjustments being made, take a thin plate of mica one-thirtieth of an inch in thickness, or thereby, or what answers still better, a similar plate of the sulphate of lime, and place it between the polarizing and analyzing plates, as shown at F in the figure. It will now be found that the whole surface of the plate A is covered with a series of most beautiful colours, which vary with the inclination of the plate F, or with the thickness of the portion through which the ray passes. The plate F being made equally thick, it will be found that there are two lines D E, F G, at right angles to each other, either of which being in the plane of polarization R A C, or A C E, the colours will disappear, and the black spot be seen as if F had not been interposed between A and C. These lines are called the neutral axes of the crystalline plate F. On turning the plate round in its own plane, the colour will increase from the neutral axes till 45°, when it will again diminish; the lines *a b*, *c d* are therefore the lines of maximum colour, or are the depolarizing axes. If the plate F be then fixed, and the plate C turned round, we will find, instead of one colour, i. e. red, that we have now two, red and green alternately, and each increasing and then decreasing as we go nearer to or recede from the depolarizing axes. It is remarkable that these colours are complementary of each other, so that when they are made to cross each other, white is the result. It is likewise worthy of remark that the kind of colour will depend on the thickness of the plate of sulphate of lime, as those produced by thin plates of glass, and that films, varying in thickness from 0·00124 to 0·01818, will give all the colours in Newton's table. See *Newton's Optics.*

Sir D. Brewster made an experiment illustrative of this subject, which we shall describe Take a plate of sulphate of lime one twenty-fifth of an inch in thickness, and grind one of the faces, so that it shall be a triangular prism, having one of the edges as thin as possible. Place this prism for a little in water, it will be acted on by the fluid, and a polish given to its faces. This prism being polarized between the plates A and C, fig. 3, will, from its differences of thickness, show all the colours in Newton's table in order; when this film is cut in two in the middle, and the two pieces crossed and placed between A and C fringes of coloured light are likewise produced; but a new set of fringes becomes also visible at an angle of 45° to the fringes parallel to the edges of the two pieces, as shown at *p n*, fig. 4, where *a b* is one of the films and *c d* the other.

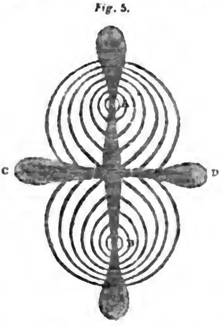
Fig. 4.



Many singular phenomena are observable in examining polarized light through doubly refracting crystals, both with one and two axes of double refraction. Thus take a rhomboid of calcarious spar, and place upon two of its opposite faces prisms of glass, whose refracting angles are about 45°, so that you may be enabled to see along the axis of double refraction of the spar. If this be substituted instead of the sulphate of lime plate in the apparatus, fig. 3, and let the polarized ray A C pass through any part parallel to the axis of double refraction, a series of most beautifully coloured concentric rings will be seen, having a black cross intersecting their diameters. No change will take place in these rings on turning the spar round its axis, but on turning the plate C changes will take place, and another system of rings comes alternately into view.

By using crystals having two axes of double refraction, Sir D. Brewster found that two systems of rings were produced. He employed nitre, which crystallizes in hexagonal prisms, having angles of about 120°, prepared as follows:—He detached with a knife a small piece of the edge of the prism, and ground it down till it was reduced to the eighth of an inch, then smoothed its parallel faces, making them perpendicular to the axis of the prism; then having wetted the faces with the tongue, he dried them quickly, and placed the plate between two plates of glass, and cemented them by a thin layer of Canada balsam. The nitre plate, thus prepared, is put into the apparatus, fig. 3, instead of F, and so situated, that the plane of its axis is either perpendicular or parallel to the polarizing plane R A C; then by looking from E into the plate C, the beautiful system of rings in fig. 5 will become visible. There is a black cross seen in the figure, one of whose arms passes through the centres of the two rings, and the other, which is more faint, crosses at right angles between the two systems. If the crystal be turned round, the arms of the cross change, and at last open, and when the turn is made 45° from the commencement, one of the arms points with both ends upwards, and the other with both ends downwards, each arm being now a hyperbolic curve, whose

Fig. 5.



centre is in the centre of its corresponding system of rings. As the points A and B are points where there is no polarization, the lines passing through them have been called the axes of non-polarization.

From what has been already said, the reader may be led to infer that there is no deviation in these coloured rings or fringes from those produced by thin plates, as given in Newton's table; but Brewster found, that in almost all crystals with two axes, the tints in the neighbourhood of the resultant axis, when the plates have a considerable thickness, lose their resemblance to the colours in Newton's table, and Sir J. F. Herschel discovered, while examining homogeneous light, that the resultant axes differ in situation within one and the same crystal, for the differently refrangible homogeneous rays. Take a crystal of Rochelle salt, and cut it into a plate perpendicular to one of its optic axes, and place it in a tourmaline apparatus; let the lens be illuminated by the rays of a prismatic spectrum in succession, beginning with the least refrangible, the red, and by gradation on to the violet. Let the eye be kept all the while looking at the rings; they will appear with remarkable distinctness, but they will also be found to contract the more refrangible the rays are, or the nearer we go to the violet. The subject will be still farther illustrated in our article *Refraction, Double*, as, without a knowledge of the principles developed there, it would be impossible to investigate this interesting branch of science to any greater extent. See also *Colour*.

POLE, Reginald, cardinal, an eminent statesman and ecclesiastic, born in 1500, was the son of Sir Richard Pole, lord Montacute, cousin to Henry VII., by Margaret, daughter of the duke of Clarence, brother to Edward IV. He entered into deacon's orders at an early age, and had several benefices conferred on him by Henry VIII., with whom he was a great favourite. In 1519, he visited Italy, and returned to England in 1525; but, in consequence of the affair of the divorce from Catharine of Arragon, withdrew to Paris. Henry desired to obtain the concurrence of his kinsman in that measure; but Pole, imbued with the maxims of the church of Rome, drew up a treatise *De Unitate Ecclesiastica*, in which he excited the emperor Charles V. to revenge the injury of his aunt. The consequence of this conduct was the loss of all his preferment in England, in return for which, he endeavoured to form a party against Henry, which design terminated in the destruction of his brother, lord Montacute, and of his aged mother, then countess of Salisbury, whom the vindictive Henry sent to the scaffold. But the countenance of the court of Rome was extended to Pole, and, besides being raised to the dignity of cardinal, he was employed in various negotiations. He was also appointed one of the three papal legates to the council of Trent. On the accession of Mary I., his attainder was reversed, and he was invited to England, where he endeavoured to moderate the rigour of Gardiner and others against the reformers, and was an advocate for lenient measures, and such a correction of clerical abuses as would conciliate them. On the death of Cranmer, Pole, then, for the first time, ordained a priest, became archbishop of Canterbury, and was, at the same time, elected chancellor of both the universities; and, while he acted with much severity in the extirpation of heresy, he made several salutary regulations for the advancement of learning. He died in 1558. Cardinal Pole seems not to have been a man of commanding talents, either political or literary; but he merited great esteem for his mildness, generosity, and comparative moderation, in an age when persecution was deemed lawful on all sides.

POLE, in magnetism. Two points of a loadstone, corresponding to the poles of the equator, the one pointing to the north, the other to the south, are called *poles*. See *Magnetism*.

POLE, or POLAR STAR, is a star of the second magnitude, the last in the tail of Ursa Minor.

POLE, PERCH, or ROD, in surveying, is a measure containing sixteen feet and a half.

POLE-AXE; a sort of hatchet nearly resembling a battle-axe, having a handle about fifteen inches long, and being furnished with a sharp point, bending downwards from the back of its head. It is principally used on board of ships to cut away the rigging of an adversary who endeavours to board. They have also been sometimes employed in boarding an enemy whose hull was more lofty than that of the boarders, by driving the points into her side, one above another, and thereby forming a kind of scaling-ladder; when they are sometimes called *boarding-axes*.

POLES OF THE ECLIPTIC; two points on the surface of the sphere, 23° 30′ distant from the poles of the equator, and 90° distant from every part of the ecliptic.

POLEMBURG. See *Poelemburg*.

POLENDA, or POLENTA; a national dish in Italy, particularly in the northern part of the country, but very common in all the Mediterranean seaports. It is a kind of soft pudding made of the flour of chestnuts or maize, generally with small pieces of meat in it.

POLICE, in the common acceptation of the word, in England, is applied to the municipal rules, institutions and officers provided for maintaining order, cleanliness, &c.; but in all the great countries of the European continent, there is, besides this police, a military police extending over the whole state, and what is called the *high police*, which is occupied in watching the political tendency of the people, and every thing connected with it. It is evident that a police of this sort, as a regular instrument of the government, is incompatible with English liberty. This high police generally forms a department under a minister; several branches of the lower police are generally connected with it, sometimes all except the lowest street police. The end of the high police is obtained chiefly by means of the secret police; that cancer which eats into the vitals of society, and the pollution of which Great Britain may be proud of having escaped, notwithstanding the violent political changes which she has undergone. The secret police consists of a body of people of all classes, needy men and women of rank, mistresses, &c., down to the waiters of coffee-houses, and the lowest visitors of taverns and houses of ill-fame, who report whatever they hear against the government. How often do they not invent stories to render themselves important! The deplorable consequences of an institution so destructive to all confidence and sense of security, are obvious, especially when it is considered that its instruments are the most worthless part of the community. On the reports of such miscreants men's lives and liberties depend; and the charges being kept secret, no means are afforded of refuting them. These agents are not unlike the familiars of the inquisition. This institution originated in France, if we do not consider the informers, whom every tyrant probably has had, as a secret police. The marquis d'Argenson, under Louis XIV., was the inventor of it. He was *lieutenant-général de la police* from 1697 to 1718 (since 1667 this had been a separate office). The prevailing licentiousness had occasioned innumerable outrages, and d'Argenson, called by his contemporaries *Rhadamanthus*, hunted out crime in its deepest recesses, and brought it to light, whatever was the rank of the offender. Sartines, director of the police of Paris, with the same power, but not the same rank, conducted the secret police from 1762 to 1774, and extended it very much; he was equally active with D'Argenson, but not so honest. He had agents in all the countries of Europe. Many stories are told of his skill in detecting crime, while others exist of a less creditable character, such as his sending a pheasant dressed with diamonds to his mistress; and when another refused to take a costly brilliant ring, he had the stone pounded to dust, and strewed the powder on the ink of a note addressed to her. Louis XVI. took the charge of the police from him, and made him minister of the marine, in which office his total inexperience made him ridiculous. (Mad. de Stael, *Considérations sur la Révolution Franç.* i. chap. 8.) Lenoire followed (1774—1784,) an honest man, who improved many departments of the police in Paris. The empress Maria Theresa requested him to write a work for her on the subject of police regulations, and the *Détail sur quelques Etablissemens de la Ville de Paris, demandé par S. M. I. la Reine de Hongrie* (Paris, 1780,) was the result. He died poor in 1807. Le Crosna followed him. He was unimportant. Never was the department of the police in the hands of a more active and sagacious politician than Fouché; never was a secret police so thoroughly organized, over, we might almost say, all Europe; and when the charge of the public police was taken from him, he had a police of his own to watch the movements of Savary, as Napoleon had had his *contrepolice* against Fouché, in which the emperor, however, was always inferior to the minister. The most glaring instance of the abuse to which the secret police is always liable, is the death of the duke d'Enghien, who perished in consequence of the reports of the secret police. Perhaps, however, there are cases in which its employment is justifiable. When a fundamental change has taken place in the government of a country (like the late one in France), and a numerous party exists, not constituting what is called, in free governments, an *opposition*, but actually striving to overthrow the established order; as, for instance, the Carlists, who exist at present in France, under such circumstances, a secret police may, perhaps, be admissible, as poisons are prescribed in some dreadful diseases, producing bad effects undoubtedly, but preventing worse. Such a department should never be intrusted but to a man of unquestionable honour and integrity. After the war of 1815, Prussia declared that the secret police (a necessary evil in times such as had just terminated) was abolished for the future. Whether it actually was abolished for a moment, we do not know; but we know that it existed not long after, and flourishes at present in that country, as in all other important governments on the European continent. One duty of the secret police always is to open suspected letters; and this was done even under Louis XIV.

The more absolute a government is, and the more it strives to be the sole moving and regulating principle of the society, to the destruction of individual freedom, the more will the police be developed; whilst, on the other hand, the freer a country is, and the more it follows the principle, that every thing which can be possibly left to take care of itself, should be so left, the more strictly is the police confined to mere matters of municipal regulation. The scientific spirit of the Germans, connected with the character of their governments, has given rise, in that country, to the *police sciences*, so called, which are systematically developed, and thoroughly cultivated. It is true, that, from the arbitrary nature of the governments, this branch of administration is extended to many subjects which, in freer states, would be left to general law or individual discretion; but, as it is obviously much easier to perfect some branches of the police in absolute governments than in free countries, particularly the medical police, valuable hints may be derived from the German system. In no country has the medical police been so much developed (frequently, it is true, to the annoyance of the people) as in Prussia, because no country ever combined more scientific men with an absolute government. Without, then, taking the Prussian medical police as a model in every particular, it has many points which it would be wise in other nations to imitate. In free countries, the place of a secret police is, in a great measure, supplied by public opinion and the liberty of the press; and it is curious to observe how the most secret transactions, or correspondence, will by degrees come to light; in fact, in some free countries, a politician needs to be quite as much on his guard against making statements in writing, as in absolute governments, since the danger of their reaching the press is as great as that of their detection by a secret police.

The first police regulations are met with in Egypt. The Mosaic code, partly founded on the Egyptian, contains many rules of this sort. The police of the Greeks was excellent. With them, as with their imitators the Romans, the police formed a separate branch of the administration. The capitularies of the Frankish kings contain the next police regulations. In 1548 and 1577, the German empire became subject to such regulations. Some account of the police of London is contained in the article *London*. See *Politics*.

POLICINELLO. See *Punchinello*.

POLICY OF INSURANCE. See *Insurance*.

POLIGNAC, Melchior de, abbé, and subsequently cardinal, a French diplomatist, was descended from a distinguished family of Languedoc, and born in 1661. In 1689, he rendered himself conspicuous by his address in the negotiations with pope Alexander VIII., relative to the articles adopted by the French clergy in 1682. In 1693, the abbé de Polignac was named ambassador extraordinary to Poland, for the purpose of detaching John Sobieski from the league with Austria, and drawing him over to an alliance with France. On the death of Sobieski (1696), he was employed in endeavouring to effect the election of the prince of Conti to the Polish throne. His intrigues, though seconded by large bribes, were, however, unsuccessful. On his return to France, in 1698, he was banished the court on account of the failure of this mission. In 1710, he was sent to take part in the negotiations at Gertruydenberg, and, in 1712, was appointed plenipotentiary to the congress of Utrecht, and was afterwards minister to the court of Rome. As a writer, Polignac is known by his didactic poem, in eight books, against the Epicurean system, entitled *Anti-Lucretius, seu de Deo et Natura* (Paris, 1747), which has been translated into English, French and German. He died in 1741. See the *Histoire du Cardinal de Polignac*.

POLIS; a Greek word (πόλις) for *city*, which appears in many geographical names, as *Nicopolis*. In Russia, it is *pol*, as *Stavropol* (city of the cross.) In some names, it has become *ple*, as in *Constantinople*; and, in some French names *ble*, as *Grenoble*, from *Gratianopolis*.

POLISH HISTORY, LANGUAGE AND LITERATURE. See *Poland*.

POLISH LEGIONS. The unfortunate result of the glorious revolution in Poland in 1794, and the third partition of that unhappy country, in 1795, filled Europe with Polish refugees, who eagerly joined the armies of republican France. In October, 1796, general Dombrowski laid before the directory a plan for raising a legion of Polish patriots, to serve under the French general against the common enemies of France and Poland. The directory recommended him to lay his plan before the Cisalpine republic, and, with the approbation of general Bonaparte, the government of that republic agreed (Jan. 7, 1797) to take a body of Poles into pay, who were to be allowed to retain their national costume, but adopted the French cockade. By April, the number under Dombrowski amounted to 5000. They served in Italy against the Austrians and Russians, and distinguished themselves on various occasions. After Bonaparte became consul, two legions were taken into French service,—that of Italy, under Dombrowski, and that of Germany, under Kniazewicz. The latter was mainly instrumental in gaining the victory of Hohenlinden. After the peace of Luneville, both legions were sent to Italy, and amounted to 15,000 men. Their services being no longer needed, and the situation of France, in regard to the powers that had swallowed up Poland, being changed, all the promises which had been made to the Polish patriots were forgotten: they were obliged to serve in St Domingo, Spain, &c. The Polish legions had, however, contributed to keep up a national existence for Poland, after the Polish state had ceased. A civil committee, the shadow of the Polish government, was kept sitting either at Paris or in Italy, strictly observing the minutest rules of the diet, in order that the constitutional character of their acts might not be questioned. They literally, therefore, formed a *nation sans patrie*, constantly looking forward to the recompense which they had been encouraged by France to hope for—the re-establishment of Poland; and it is an interesting fact, that, whenever the thanks of the French nation were voted to the gallant legion, Dombrowski invariably, in his answer, reminded the French government of its engagements towards Poland. Their expectations were at last, in some degree, realized in 1807 and 1808, when Napoleon constituted the grand-duchy of Warsaw (with 4,000,000 inhabitants), composed of Polish provinces, torn from the clutches of Austria and Prussia. Frederic Augustus, king of Saxony, was named grand-duke. See the article *Poland*; see, also, Chodzko's *Histoire des Legions Polonaises en Italie*; 2 vols, Paris, 1829.

POLITIANUS, ANGELUS; a learned and elegant scholar of the fifteenth century, born in 1454, at Monte Pulciano, in the Florentine territories, whence he derived the appellation by which he is more usually known than by that of *Cinis*, his family name. The first production which brought him into notice was a Latin poem on the tournament of Giuliano de' Medici. He assumed the ecclesiastical habit, and acquired by his accomplishments the favour of Lorenzo the Magnificent, who made him tutor to his children, and presented him with a canonry in the cathedral of Florence, which he held with the professorship of the Greek and Latin languages. Among the most esteemed of his writings are an Account of the Conspiracy of the Pazzi; a Latin translation of Herodian; and a Collection of Greek Epigrams; besides some miscellaneous works in prose and verse, and a drama on the story of Orpheus, printed in 1475. This latter piece was set to music, of which science he was so passionately fond, that his death is said to have been accelerated by his propensity. An unfortunate attachment to a lady of distinguished rank had brought on a severe illness, which was so much increased by his starting out of bed, in a fit of enthusiasm, to celebrate her beauties on his lute, that his death was the consequence, in 1494.

POLITICAL ECONOMY is the science which treats of the general causes affecting the production, distribution and consumption of things having an exchangeable value, in reference to the effects of such production, distribution and consumption, upon the national wealth and welfare. The definition of this science has been a subject of some discussion. That of Mr Malthus gives it a wider range than is conceded to it by Mr M'Culloch, extending it to the investigation of the production and consumption of all that man desires, as useful and agreeable, according to which definition Mr M'Culloch says it would include all other sciences, so that "the best encyclopædia would really be the best treatise on political economy." But Mr M'Culloch's definition is liable to the same objection, if taken in its full literal sense; for he calls it "the science of the laws which regulate the production, distribution and consumption of those material products which have an exchangeable value, and which are either necessary, useful or agreeable." This definition would evidently, if taken in its full breadth, comprehend a very large portion of the encyclopædia. But though Mr Malthus considered the science as comprehending all those things which men desire as useful or agreeable, yet he undoubtedly intends to limit it to certain views of this great variety of subjects. But the definitions, both of Mr Malthus and Mr M'Culloch, seem to be too broad. Political economy refers only to the general causes affecting the productive faculties and means of a nation, meaning by *productive faculties* and *means* the capacity and resources for producing things that have an exchangeable value. Thus the constitution of government, the laws, the judicial, social and economical institutions, the schools, the religion, morals, soil, geographical position, climate, arts, indeed all the circumstances in the character and condition of a people, as far as they have a general effect on the public wealth; in other words, the production, distribution and consumption of commodities, are subjects of this science. It is, accordingly, a science of a lofty and liberal character, not identified with that of politics, but very nearly allied to it, and, indeed, one of its branches; for a man would be but ill qualified to legislate for a state, who should be ignorant of the general laws affecting its productive capacity. This being the character of the science, it is not a little remarkable that it has not been more honoured and more generally studied, as a distinct field of inquiry; for it has necessarily been studied and practically applied by all statesmen and rulers, from the beginning of time, since the effect of all measures of the government, and all causes, upon the condition of a community, must have been objects of consideration, from the dawn of human reflection, though the notions of men may have been very crude, and often erroneous, upon this as upon all other sciences. Men very early studied the human body, and even formed something like a science to account for its functions; but correct notions of anatomy are of comparatively recent origin. The science of chemistry is still more recent. That of political economy, like others, has had its stages of progress, and some of its professors consider it now to be placed upon as firm a basis, and reduced to a system of rules as completely demonstrated, as that of astronomy since the time of Newton; while others consider the present state of political economy as far below a full development and demonstration of its principles, as the system of the nine mundane spheres, or perhaps the theory of Tycho Brahe, as compared to modern astronomy. It certainly seems to be singular, if the rules whereby a nation may be made to flourish or decay, are as well defined, and as satisfactorily demonstrated, as the theorems of geometry, that they should be so rarely and so imperfectly reduced to practice. Some of the fundamental doctrines of those writers, who have occupied the greatest space in the written expositions of this science, are not adopted by any nation whatever occupying a respectable rank in the civilized world. This might be accounted for, if the doctrines in question were professedly proposed for simultaneous adoption by all nations, like those of the peace societies; for then the doctrines might be theoretically true, but yet fundamentally inapplicable in the actual condition of the world. But these doctrines are not proposed as being subject to this condition; they are pressed upon every single people, without regard to the conduct of others, and independently of the policy that may be pursued by foreigners. It is not one of the conditions on which they are recommended, that nations must be prepared for their reception by an entire revolution in national relations and policy, and that they can have place only in the train of events attending a political millennium; their advocates profess their adaptation to the present state of national rivalships and collisions of interest. It follows that the practical truth of these doctrines is not so demonstratively proved as their advocates suppose, or that the legislators are not so wise as they should be. In this state of the case, admitting a great deal of corruption, ignorance, and error, on the part of those who control the measures of the different civilized nations of Christendom, yet their general concurrence in rejecting these doctrines, even in those two or three countries where they are most confidently asserted and most learnedly inculcated, presents an authority against their practical utility quite as imposing as that of the professors by whom they are so strenuously advocated. This science, like other speculative sciences, commenced in theories; and the discussion and refutation of them still occupies a great share in the recent treatises—a circumstance which, of itself, shows that it is in rather a rude state; since, in those sciences which have reached an advanced state, the visionary systems of the first speculators are now mentioned as matters of mere historical curiosity, a formal confutation of which would be superfluous. Another circumstance indicates the rude state of this science: it is matter of common observation that the early explorers of the arcana of science assume a certain oracular, mysterious air, the infallible badge of empiricism, which always disappears on the establishment of real knowledge. And the mystical, solemn, and somewhat pompous air of many of the doctors of political economy affords some ground for suspicion that this science has not yet reached perfection. Unless we should consider the notion of some ancient nations, that plunder was the great source of national wealth, as a theory in this science, the first step in political economy was the theory of the commercial or mercantile system, which taught that a nation could grow rich only by trade, and that its growing rich in this way depended on the balance received in the precious metals, on adjusting its accounts with other nations. Neither of these views is entirely visionary; for a nation may gain wealth by carrying on either war or trade, upon very advantageous terms. It is assumed, indeed, that all commercial exchanges are only those of equivalent values. But, notwithstanding this axiom, an individual merchant or speculator will sometimes make his fortune by exchanging, or, in other words, by buying and selling. And so a nation, if it possesses some very great commercial advantage—like those of the early Spanish traders with the native Americans, who could exchange iron and bits of tin for a much greater weight of gold, may grow wealthy by trade; for the nation may in this way get, for what costs them only a day's labour, what would cost them, or what may be worth to them, five, six, or twenty days' labour. The mercantile system had therefore some foundation in fact and experience; for every one will probably admit, that any particular branch of trade may be more or less advantageous to those engaged in it, and to the countries to which they belong, and that one branch may be more advantageous than another. It is said, indeed, that a disadvantageous trade will cease; and it is thence inferred that all those which continue to be carried on are profitable and useful. This is, at least, admitting that there may be a disadvantageous trade, and that some branches may be advantageous will not be disputed. The mercantile system, then, had some foundation; but, like some other theories of political economy, it was carried too far. The science of national wealth, as applied to nations generally, is reduced to very narrow limits, if we suppose it to rest wholly upon the bargains made in foreign barter. They mistook, then, in magnifying the relative importance of foreign trade as a part of the causes of national industry and resources, since the annual profit derived thence, even in a very commercial country, does not usually exceed some very inconsiderable per centage of the whole annual production and consumption. But a still more objectionable part of this theory was the supposition that the gain thus derived depended wholly upon the balance received in gold and silver,—according to which notion such a country as Mexico, a great portion of the exports of which are necessarily gold and silver, could never grow rich. The more it produced of the very articles the gaining of which alone could make other nations rich, the more demonstrably impossible it was that it should grow wealthy itself. So far, therefore, as the theory referred national growth in wealth exclusively to the receipt of such a balance of trade, and made the growth in wealth proportional to the amount of this balance, it was entirely fanciful. This theory was supported, in the latter part of the seventeenth and early part of the eighteenth century, in England, by Mr Mun, Sir Josiah Child, doctor Davenant, and Sir James Stuart; but it was called in question at the same period by Sir William Petty, Sir Dudley North, Mr Barlow, and later by Sir Matthew Decker and Mr Harris. Sir Matthew Decker's Essay on the Decline of Foreign Trade was published in 1744, and Mr Harris's Essay upon Money and Coins, in 1757. Mr Hume treated of the same subject in his Political Essays, published in 1757. So far, then, as this theory rested upon the notion of a money balance, as being the only source of national growth in wealth, it was ably discussed before the publication of Smith's Wealth of Nations. But the practical question at the bottom of the theory, namely, the national advantages and disadvantages of particular branches of trade, and the effect upon a nation of a trade, which keeps it always in debt to another, has not been settled to this day; the economists of the *new school*, as it is termed, maintaining that all foreign trade is advantageous to a country precisely to the degree to which it is profitable to those engaged in it, and, therefore, that the immediate interest of the merchant, under the actual circumstances, is the infallible criterion of the national interest; while others, on the contrary, and with them most legislators, practically act upon the doctrine, that the immediate interest of the merchant is not in all cases a criterion of the permanent national interest. The doctrine resolves itself into this maxim, namely, that the interest of a nation that was to exist only for two or three years, and then to be swept away by a pestilence, or swallowed up by an earthquake, and of a similar one that was to exist for as many centuries, would lead to precisely the same policy for the present year in respect to foreign trade; so that no regard is to be had, in commercial regulations, to the vicissitudes of war and peace, and other changes incident to a nation. In a question, then, of vital importance, which has now been agitated for more than two centuries, the theoretical economists are divided. We think we may say, then, that the real question which gave rise to the mercantile system is still involved in much obscurity. See articles *Mercantile System*, and *Balance of Trade*.

The manufacturing system has been ranked as another economical theory; but it can hardly be regarded in this light. It supposes that a nation promotes its wealth and productive capacity by manufacturing for itself all those commodities, for the manufacture of which it is adapted by its climate, agricultural pursuits, and the habits and character of its people. It is not now disputed that manufacturing will contribute to the aggregate value of annual products, as well as agriculture or commerce. The only questions are, 1. What descriptions of manufacturing industry will increase the productive resources of a particular country; and, 2. Whether it should be an object of legislation to foster and promote these branches of industry. Those opposed to any such legislative interference, namely, the advocates of free trade, assume that the national industry, left entirely free, and open to a competition with that of other nations, will infallibly take those channels by which its aggregate results will be the greatest. The foundation of the doctrine of the *let us alone* policy was laid by Adam Smith, since whose time its advocates have assumed it upon the principles by which it is supported in the Wealth of Nations. Smith rests the doctrine upon two propositions:—1. "That every individual can judge, better than any statesman or lawgiver can do for him, what is the species of industry on which he can best employ his capital:" and, 2. "The study of his own advantage naturally, or rather, necessarily, leads every individual to prefer that employment of capital which is most advantageous to society." The doctrine of free trade rests wholly upon these two propositions. Our limits will not allow us to consider the arguments in favour, or against their soundness as the guides of legislation in all cases. For these the reader is referred to the works mentioned at the end of this article, also to Mr Phillips's Manual of Political Economy. It is sufficient to remark here that the doctrine of free trade must be, as yet, considered merely a theory.

Another theory, in relation to national wealth, was that of Quesnay, denominated the *agricultural system* (see *Physiocratic System*), namely, that agricultural is the only productive sort of labour, since this affords a surplus (to wit, rent), after paying the labourer; whereas, all other kinds only replace the value of the stock, and pay the wages. This theory is, however, entirely exploded; and, besides, it is of a kind not calculated to do any practical injury; for no nation would think of legislating upon the assumption, that, because the raising of cattle, and thus producing hides, was, according to this doctrine, a productive labour, and that of tanning the hides, and making the leather into shoes, was not productive, or left no net gain; therefore, the two latter branches might as well be discontinued.

These doctrines go to the general national industry and growth in wealth; others are partial in their application, of which we will notice a few that are adopted by those writers who are the most disposed to consider political economy a science. One of these doctrines, stated by Adam Smith, is, that the wages of common day labour finally fix at the point at which they barely afford the labourer the means of subsistence, and of continuing the race of labourers. This is called by the followers of Adam Smith the "natural rate of wages." It is usually assumed in their writings as settled. But it is not pretended that the wages of labour are the same in the different countries of Europe; on the contrary, it is everywhere taken for granted, that they are higher in some countries than in others. It would follow from this doctrine, that in those countries the necessary expense of supporting and reproducing the labourers, is in proportion to the wages paid in them respectively; whereas the fact is quite otherwise. And what entirely confutes the notion of any such "natural rate" of wages, is, that the rate varies in different kinds of labour, in which the expense of supporting, instructing, and reproducing the labourers, is apparently equal. The very statement of this doctrine presupposes a natural rate of expenditure for shelter, clothing, and food, for the labouring classes, a supposition which has no plausibility in theory, and no support in fact. The doctrine of a natural rate of wages of the labouring classes is, indeed, entirely fanciful. It is very true that the present pecuniary interest of those who hire and those who are hired, is at variance, as well as that of those who buy and those who sell; and the party having the greatest advantage in either case, will, generally speaking, use it; and, accordingly, where the labourers are poor, thriftless, and improvident, saving nothing, and being obliged to depend upon the earnings of the day for their food, they put themselves very much in the power of their employers. If to this be added a superfluity of labourers, and a want of employment for all, the advantage of the employers is increased, and the labourers will accordingly be reduced to a lower and lower compensation, until, perhaps, at length, the wages paid will not more than supply them with the poorest fare, and the meanest clothing and accommodations. But the degree to which they may be reduced by the operation of these causes, will evidently depend upon the situation of the country, the demand at successive times for labour, in comparison with the supply of labourers, and, most of all, upon the character of the labourers themselves. To say that there is some point at which these circumstances are naturally balanced, in all countries and all stages of economical improvement at which the "natural rate" of wages is graduated, seems to be a proposition too fanciful and vague to deserve the name of a theory. But such is the doctrine of the economists.

Another leading doctrine of Adam Smith and his followers grows out of the state of the English poor laws. It is, that all provision by law for the support of the poor is useless and injurious. This doctrine is fortified by Mr Malthus's theory of the fatal necessity of starvation. He maintains that human fecundity tends to get the start of the means of subsistence, since the former moves with a geometrically increasing rapidity, and soon leaves behind the latter, which can only proceed at a uniform arithmetical pace. The inference which he makes from this is, that the human race has been and will be kept down to its actual numbers by starvation. The consequence drawn from this proposition, which is stated with all the air of a demonstration, is, that poor-laws, or any efforts of charity, are only a childish and useless indulgence of feeling; for, since there will be superfluous numbers, who must at all events be starved, if the life of one is saved by charity, whether public or private, it is only that another may be starved in his stead. A more heart-hardening doctrine could not be broached. It is a conclusion at which humanity revolts, and to which no one will consent without compulsion. How, then, is the fact? The theorem requires that some millions should perish of want annually. It does not, however, appear that they do so perish. And yet this doctrine is reiterated, and very complacently inculcated, as a part of the *science* of political economy. See *Pauperism.*

A proposition dwelt upon at some length by Mr Say, and carefully inculcated in many other writers on the science of economy, is, that production is not *creation;* that a farmer cannot make corn, nor a weaver cloth, out of nothing. Mr M'Culloch says labour is "the only source of wealth." This is one of the doctrines of the economists, from which consequences of some weight are deduced. Now all will, without doubt, agree, that without any materials, or, in other words, without the *earth*, men would not produce wealth; and it may be conceded also, for the purpose of the argument, that the earth, without inhabitants, would have no wealth. But men, being placed upon earth, may produce wealth by working upon the materials supplied by it; and the earth is itself sold in portions as a part of the common stock of wealth, and the men are also sometimes themselves bought and sold, as being a part of the same stock. In general, two things must concur in order to the production of value, namely, the thing to be wrought or used, and a person to work or use it. To insist that one or the other is the exclusive *source* of value, seems to savour more of the obsolete metaphysics of the schools, than of practical speculation. The utmost that can be made out of it, is a merely verbal distinction. And one would hardly expect so trivial a subtilty to occupy much space in a branch of knowledge holding the rank of a science.

All writers agree in the doctrine that security of property is essential to the accumulation of the products of labour, that is, wealth, for no one will save what he has no reasonable assurance that he shall enjoy; and it is also agreed by all, that accumulation, that is, a stock on hand, is necessary to the productiveness of labour.

Adam Smith lays great stress upon the division of labour, as one of the causes of the great productiveness of industry. His remarks upon this subject are just, with the qualification, perhaps, that he over-estimates the importance of the principle, since he attributes to it the improvements made in various processes of industry, whereas many of the improvements are themselves the causes, or rather afford the means of a separation of employments. Any machine is an illustration of this remark.

It is asserted by some of the writers on this science, that there are no limits to the beneficial effects of the accumulation of capital upon the productiveness of the industry of a nation; or, in other words, that a given number of people, however small, can advantageously employ any amount of capital, however great. But if we assume a certain number of employments and professions, there is certainly a limit beyond which no additional stock and materials could be employed. The proposition may mean that the ingenuity of men can, or will, find out modes of employing advantageously any amount of capital that can be accumulated by them. The proposition thus stated, is at least a theoretical one; but the inquiries and investigations to which it leads, are certainly not sterile of useful results.

All the products of industry are divided among the persons by whom the taxes are received and consumed, the holders of sinecures, the capitalists, and the labourers, including in this latter class all the industrious in all professions and pursuits. A great problem in political economy is to determine the mode of distribution most advantageous to the nation; and this problem, which is very general and very complicated in its details, has not yet been fully solved. It is generally agreed, that all absolute sinecures, whether under the government, or otherwise constituted, are prejudicial. What distribution among the usefully employed, or what comparative remuneration for the labour or services of the respective classes and professions, is the most advantageous, is a subject very little discussed by the writers on economy. But the question as to the distribution between the capitalists, who are entitled to profits, and those who labour upon or with the capital, who are entitled to wages, is a subject of considerable speculation in the books. One doctrine is, that where profits are highest, accumulation will be most rapid; that is, the greater the mass of the annual products that go to those whose capital supplies the materials and instruments of labour, the more rapid will be the growth in wealth. This is assuming that nothing will be saved by the labourers, or not so much in proportion as will be saved out of the profits. The first assumption cannot be made, and the second is questionable; for example, a great proportion of the agricultural labourers by the month, in America, are young men, who save their wages in order to purchase a farm for themselves. There is no mode of saving that could be devised which would so rapidly promote the increase of the national stock, and a change whereby the farmers, by paying less wages, should themselves make greater profits, instead of augmenting the national accumulation, would very materially check it. Other instances might be given to the same effect. The doctrine, therefore, seems to be unsound. Taking the two divisions in the above distribution, it is evident that one cannot be increased but at the expense of the other. But there is one species of capital distinguished from all others, namely, that in land. The lower the rents are that are paid for the mere use of land, in exclusion of buildings and fixtures, the greater amount of annual products will be left to divide between those who supply the stock, and those who perform the labour. It may, we think, be laid down as a sound maxim, that low rents, which leave a proportionally large amount of the annual income to be divided, as wages and profits, will very materially promote the national growth, by giving greater stimulus to labour and the employment of stock. This mode of distribution explains, in part, the fact that both the wages and profits are higher in the United States of America than in Europe. By higher wages, we mean not merely the money price, but the greater quantity of similar articles that can be purchased for the wages of the same labour. So far high profits and high wages are compatible; but, when the question is between wages and profits, as it is put by the economical writers, the preference of high profits at the expense of wages, seems not to be well founded as a general doctrine, though it may be true of Great Britain.

After disposing of the question, whether agricultural, manufacturing, or commercial industry, is most advantageous to a nation, and concluding, as all now agree, that they are equally conducive to national wealth, contrary to the opinion of Adam Smith, who gave the preference to agriculture, the writers on economy then go into the inquiry, how far any one of these branches is objectionable on account of its effect on the character of the population. In this respect, foreign commerce is undoubtedly the most injurious of the three. As to manufacturing, its varieties are almost infinite, and no general remark is applicable to the effects of all upon the persons employed. It seems, indeed, to be now pretty well agreed, that the mode of conducting any branch of manufacture, and the system of educating and employing the operatives, determine the effects of the employment upon the character and habits of the population: and that it is not the necessary effect of this or that branch of manufacturing, to degrade and corrupt the persons employed in it. In this opinion the writers on economy generally agree.

The same writers agree generally in the definition of *value*, as being determined by the amount of marketable things, for which an article can be exchanged. It is also well settled that demand determines the market value; but they assert again, or at least seem to imply, that value and cost are synonymous. They also generally imply, by the mode of using the term *cost*, that it is some definite, fixed quantity. This use of language throws great obscurity on their speculations on this subject, since the cost of producing an article varies from week to week, by the variation of the price of the materials, and the wages; and the same kind and quality of articles will, at the same time, cost one producer more than another. The proposition that cost regulates value, is laid down by the writers with great solemnity, and inculcated at great length. It is a subject on which there certainly is a great deal of unprofitable prolixity in the books; for what argument or illustration is necessary to establish the proposition, that men will not continue long to produce an article by which they lose money? The proposition seems to stand in quite as great need of an apology for stating it, as of a disquisition to explain or support it.

Mr Ricardo's theory of rent is an ingredient in recent treatises on political economy. The result of his theory is, that if there was no difference in the productive qualities of all the parts of the whole territory of a nation, there would be no such thing as rent. The conclusion of his theory is, that every additional bushel of corn raised in a country costs more than the preceding. Very few persons will probably assent to the first of these two propositions, and the last is absurd as applied to many countries. He doubtless had England in his view in framing his theory; but Mr Lowe denies its accuracy in respect to England, as a matter of fact, upon the statement of cultivators themselves. Mr M'Culloch goes into a consideration of the effect of the fluctuations of wages upon the cost of commodities, in order to establish the proposition, that if the cost of the production of two articles depends upon the use of machinery, and the machinery for one is of short duration, and that for the other of long, then a rise in wages will affect the cost of the products of the transient machinery, more than that of the other. He discusses this proposition quite elaborately, for the purpose, apparently, of showing that an increase of wages will, in effect result in a comparative enhancement of the profits of the producer who uses the durable machinery; for he has only to pay the advanced wages for working his machine, whereas the other must pay both for replacing and for working his. This is rather an obscure and nice distinction, and, to be just, requires that the price of the durable machine shall not have risen in value, in consequence of the increase of the expense of building a new one, by reason of the rise of wages; whereas, it is according to common experience to suppose that it would rise in value, in which case Mr M'Culloch's theory vanishes.

Passing over what relates to consumption (q. v.), the above are some of the leading doctrines and theories of what is called the science of political economy, as taught by recent writers in Britain and France; a science of which Adam Smith is said, by its professors, to be the founder. Perhaps no study of the day, which bears the name of science, presents more vague theory, grave, mysterious empiricism, dull prolixity, inconsequential arguments, gratuitous assumptions, jejune discussions, and elaborate triviality. There are many useful truths, which pass under the name of political economy; but a large proportion of the treatises, from that of Adam Smith downwards, by the disciples of his school, seem to bear the same relation to an intelligible practical development of the causes and phenomena of national growth, wealth and decline, that alchemy does to modern chemistry.

For other branches of political economy, see the articles *Banks, Bounties, Circulating Medium, Commerce, Consumption, Corn Laws, Credit, Debtor and Creditor, Direct Tax, Labourers, Labour-saving Machines, Lotteries, Mercantile System, Money, Monopoly, Literary Property, Patent, Physiocratical System.* The following are some of the principal writers on political economy: 1. On the mercantile system: Stuart's Inquiry into the Principles of Political Economy (3 vols., London, 1767); Genovesi, *Lezioni di Commercio ossia d'Economia civile* (2 vols., Bassano, 1769); Busch, *Abhandlung von dem Geldumlauf* (2 vols.; new edition, Hamburg, 1800). 2. On the physiocratic or agricultural system: Quesnay, *Tableau economique avec son Explication* (Versailles, 1758); this work was printed, with several others on the same system, in a collection edited by Dupont de Nemours, entitled *La Physiocratie* (6 vols., Yverdum, 1768): Turgot, *Recherches sur la Richesse et l'Origine des Richesses nationales* (Paris, 1774); Le Trosne, *De l'Orde social* (Paris, 1777); Theodore Schmalz, *Staatswirthschaftslehre* (2 vols., Berlin, 1818). 3. Adam Smith's system, as set forth by himself, and developed by his followers: Adam Smith's Inquiry into the Nature and Causes of the Wealth of Nations (2 vols., London, 1776; 4 vols., Edinburgh, 1814): Sartorius, *Von den Elementen des Nationalreichthums und von der Staatswirthschaft* (Gottingen, 1806); Luder, *Ueber Nationalindustrie und Staatswirthschaft* (3 vols., Berlin, 1800); Say's *Traité d'Economie politique*; Ganilh's *Des Systemes d'Economie politique* (2 vols., Paris, 1809 and 1822); Storch, *Cours d'Economie politique* (6 vols., Petersburg, 1815); and his *Betrachtungen uber die Natur des Nationaleinkommens* (Halle, 1825); Sismondi's *Nouveaux Principes d'Economie politique* (2 vols., Paris, 1818); Ricardo, On the Principles of Political Economy and Taxation (new edition, London, 1819); Malthus's Principles of Political Economy (London, 1820); Jakob, *Grundsatze der Nationalokonomie* (Halle, 1805 and 1825); Soden, *Nationalokonomie*

(9 vols, Leipsic, Arau and Nuremberg, 1805—24); Whately's Introd. Lect. on Polit. Econ. (1831); Senior's Lectures on Population (1831); Sadler, Law of Population (anti-Malthusian) (vols. i. and ii. 1830); Cooper's Lectures on the Elements of Polit. Econ. (Columbia, 1826); Cardoso's Notes on Polit. Econ. (Charleston, 1826); Thoughts on Polit. Econ. by D. Raymond (Baltimore, 1820).

POLITICAL INSTITUTIONS. The origin of political societies and institutions has been a frequent subject of disquisition. Like many other things, they are supported from an instinctive feeling of their necessity, though their origin and true principles may not be correctly understood. The universal feeling of their necessity has induced some persons to compare political institutions to languages; both, they say, are essential to the existence of mankind; both exist from time immemorial, and neither can be changed at will;—a comparison which tends, like other partial analogies, to lead the inquirer into error. The theories of the origin of the state may be comprised under two heads—those which make *authority* the starting point, and those which seek it in *equality*. Those who support the former principle are again divided; some recur at once to God, and say, that he united all power in the hands of the father of the family, who, therefore, at first, had the priestly and princely, as well as the paternal authority; and it was only in later times that these functions became separated; but it is idle, in scientific speculation, to refer positive institutions to God. He implanted the principles of every thing good, but we are not to take for granted a direct inference, on his part, in their application. Other advocates of authority place the origin of political institutions in force. Mr von Haller started this idea anew. (See the article *Haller, Charles Louis von.*) We have already spoken of the mistake of laying much stress upon the supposed origin of bodies politic, in the article *Estates* (vol. iii. note on p. 97). What did Mozart, in composing his Requiem, care for the origin of music? or Ariosto, or Milton, for the origin of languages? Political institutions may have originated in a variety of ways, from force, compact, reverence, &c.; and they actually have, as history shows us. But their accidental origin does not show the principle which lies at their foundation, holds them together, and is understood more clearly with the improvement of the social order. The accidental origin of the hut of the savage does not teach us the principles of architecture. These are gradually unfolded, in proportion as the art advances. The principle which lies at the basis of all political union we hold to be the idea of the just, as that of the good is the foundation of morals, and that of the beautiful of the fine arts. The idea of the just, again, in politics, is but a modification of the idea of equality. This is the animating principle of all political societies, whatever may have been their origin, and is invariably developed in the progress of society, as the flower is the product of the perfect plant. The idea of force declines as this principle is unfolded. We might add, that the idea of the just is at least as ancient as that of paternal authority; because, as soon as two individuals are placed together, the idea of equal rights arises, the idea of "doing as one would be done by." Still more is this the case in a family, because as soon as there are several children, parents as well as children feel that it is not right to prohibit to one of the children what, in the same case, would be allowed to another. That children obey their parents originally from a mere feeling of inferiority, may be allowed; but states consist of men, and little would the remembrance of former inferiority avail for the maintenance of social order. The idea of the state and of law (for both go hand in hand, and the essence of law is equality, even where it establishes differences and privileges) has a much surer foundation in the idea of the just, which is as primitive an idea as that of the good. Whether, therefore, all bodies politic were originally founded upon the social compact or not, this social compact is the fundamental idea of all, and that to which all strive in the progress of their development. See our article *Estates* for the various stages of political government; see, also, *Constitution*, and *Sovereignty*.

POLITICS, in its widest extent, is both the science and the art of government, or the science whose subject is the regulation of man, in all his relations as the member of a state, and the application of this science. In other words, it is the theory and the practice of obtaining the ends of civil society as perfectly as possible. In common parlance, we understand by the *politics* of a country the course of its government, more particularly as respects its relations with foreign nations; and the more important these relations are (as, for instance, in European states, which exert so powerful an influence on each other), the more prominent is the place which they hold in the ideas conveyed by the word; whilst in kingdoms, whose relations to foreign countries are comparatively unimportant, the word, in common usage, is naturally more confined to the principles and operation of the internal government. Politics, therefore, extends to every thing which is the subject of positive laws; for it is by means of these that the purposes of a state or civil union are effected. The political relations of men have therefore always been the engrossing subject of history. (See the definition of *history*, at the beginning of the article on it.) As the idea of *politics* depends upon that of *state*, a definition of the latter will easily mark out the whole province of the political sciences. By *state* we understand a society formed by men, with the view of better obtaining the ends of life by a union of powers and mutual assistance. This idea of state is the basis of a class of sciences, and gives them as distinct a character as belongs to the various classes of historical, philosophical, theological, medical, &c., sciences. The political sciences are divisible into the *abstract*, or purely philosophical, and the *historical* and *practical*. This, however, is not the best order for studying them. The following order may, perhaps, be adapted to the wants of the scientific student:—

1. *Natural law*, which treats of the rights and duties of men in the absence of all positive regulations. As the idea of law and the mutual obligations of men is closely connected with that of the state or government, the philosophy of government enters, in some degree, into this science, so that the various views of the origin of governments, whether they are to be considered as founded essentially on compact or force, or as having a divine origin, &c., fall under natural law. The subject of *natural law* is treated at considerable length in the article on that subject, in this Encyclopedia, to which we refer the reader; also to the article *Haller*, as he gives a peculiar turn to the old notion of divine right.—For the various theories of natural law, see the works of Hugo Grotius, *De Jure Belli et Pacis* (Paris, 1625), which belongs, however, more properly to the practical law of nations; Puffendorf, *Elementa Jurisprudentiæ universalis*; Wolf, *Jus Naturæ, Methodo scientifica pertractatum* (8 vols., Halle, 1740—49, 4to); Montesquieu's *Esprit des Lois*; Rutherforth's Institutes of Natural Law; Ferguson on Civil Society; also the works on gov-

ernment by Filmer, Locke, Mackenzie, Algernon Sidney, Hume, Milton, and a host of modern writers.

2. Though the theory of government falls, in some degree, under natural law, yet the full treatment of so extended a subject gives rise to a separate branch of science, which we might call *abstract* or *theoretical politics*. This department treats of the object of the state, and the relation between the state and the individual; of the right to prescribe laws, and to punish; of fundamental laws and compacts; of the various forms of governments—monarchies and republics, aristocracies, democracies, representative systems, &c.; of the division of powers, legislative, judiciary, executive; of the means of obtaining the true ends of the state; of the relations between different political societies, &c.; and of the whole subject of criminal law (q. v.), philosophically considered. Among the most important authors on these subjects are Plato, Aristotle, Cicero, among the ancients; Macchiavelli, *Il Principe*, with Frederic the Great's *Antimacchiavelli* (1741), and that by Jakob (1794); Hubert Languet (under the assumed name of Stephanus Junius Brutus, *Vindiciæ contra Tyrannos* (Soleure, 1577); Mariano, *De Rege et Regis Institutione* (see *Mariano); Hobbes*, *De Cive*, and *Leviathan, seu de Materia, Forma et Potestate Civitatis* (see *Hobbes*); Locke, Two Treatises of Government (see *Locke*); Rousseau, *Contrat Social;* Chr. von Wolf, *De Jure Civitatis* (Halle, 1748); Aug. Schlozer, *Allgemeines Staatstrecht und Staatsverfassungslehre* (Gottingen, 1793); Von Haller; Zacharia, *Vierzig Bücher vom Staate* (Tubingen, 1820, et seq.); Salmasius, *Defensio pro Carolo I.*, and Milton's answer to him, *Defensio pro Populo Anglicano;* and Milton's Tenure of Kings and Magistrates, his Ready and Easy Way to establish a Free Commonwealth. Among the writers who have treated *criminal law* philosophically are Beccaria, *Dei Delitti e delle Pene* (Naples, 1764); Feuerbach, *Revision der Grundsatze und Grundbegriffe des positiven peinlichen Rechts* (2 vols., Erfurth, 1799), and his *Lehrbuch des peinlichen Rechts* (9th ed., Giessen, 1820); Grolman, Tittman, Henke.

3. *Political economy*, which treats of the resources of national wealth, and the circumstances which affect it advantageously and disadvantageously. (See *Political Economy*.) The Germans give the name of *national economy* to what is generally comprised, with us, under political economy. Under *state economy* they include the management of the finances, and the regulations by which the government influences the wealth of the state. Under this latter branch, they treat of taxes, monopolies, loans, imports, exports, &c.

4. *Science of police.* See *Police.*

5. *Practical politics*, or the art of administering the government of states, both in regard to their internal and external relations. This branch tests the principles of political institutions, whether liberal or despotic, whether advocated by the holy alliance or by the friends of freedom.

6. *History of politics.* This traces the variety of civil governments; the causes of their rise and decay; how one grew out of the other; how they underwent fundamental changes, from the patriarchal form, in which religious institutions, civil government and family relations were rudely mixed, to the theocratic, in which the two former were blended; to military monarchies, after the separation of the military power from the priesthood; to democracies or aristocratic republics; to feudalism; to aristocratic constitutional monarchies; to representative aristocratico-democratic governments; and, at last, to democratic representative governments. The enumeration of the works necessary to the student of this branch would far exceed our limits.

7. *History of the European and American systems of states*, as forming each a family of members under constant and intimate mutual influence. In as far as the relations of the members of these families can be learned from treaties of peace, &c., there exist very valuable materials—collections of documents by Du Mont, Rousset, Wenk, Von Martens, Koch, Scholl, Isambert, &c. The first attempt to treat this branch systematically was by J. Jac. Schmauss, in his Introduction to Politics (in German), and commentaries on the *Corpus Juris Gentium Academicæ* (2 vols., Leipsic, 1741), edited by him. Koch wrote an *Abrégé de l' Histoire des Traités de Paix entre les Puissances de l' Europe depuis la Paix de Westphalie* (4 vols., Basil, 1796; a new edition in 15 vols., by Fr. Scholl, Paris, 1817). George Fr. von Martens wrote a sketch of a Diplomatic History of the European Political Negotiations and Treaties, from the End of the Fifteenth Century to the Peace of Amiens (in German, Berlin, 1807). Heeren wrote a Manual of the History of the European System of States (fourth edition, Gottingen, 1822); and Politz, Political Sciences (3d vol.); both in German.

8. *Statistics*, or a knowledge of the actual condition, resources, &c. of states. The term was first used by the Germans.

9. *Positive, public and constitutional law.* This branch gives a scientific representation of the fundamental laws and constitutions of the various European and American states. Materials for this branch are found in Lacroix, *Constitutions des principaux Etats de l' Europe et des Etats-Unis de l' Amerique* (third edition, Paris, 1802); George Fr. von Marten's Collection of the most Important Fundamental Laws (in German); Politz, the Constitutions of the European States, during the twenty-five last Years (4 vols., Leipsic, 1817—1825, in German); Luder's Diplomatic Archives for Europe (3 vols., Leipsic, 1819—1823, in German); *Archives Diplomatiques pour l'Histoire du Temps et des Etats*, (6 vols., Stuttgard, 1821—1825); and its continuation—*Neueste Staatsacten und Urkunden* (11 vols., Stuttg., 1825 seq.); Dufau, Duvergier and Guadet, *Collection des Constitutions, Chartes et Lois fondamentales des Peuples de l'Europe et des deux Amériques* (6 vols., Paris, 1821—23); Alb. Fritet, *Science du Publiciste* (11 vols., Paris, 1820—1823).

10. *Practical law of nations*, containing the scientific exposition of the principles adopted by modern civilized nations for the regulation of their mutual relations in peace and in war. To this belong the rights and duties of neutrals and belligerents, the rules relating to prizes (see *Prize*), prisoners, blockade, conquest, &c. The rules of national law are not drawn up in a code, but are merely the principles which have developed themselves within the last 300 years. (See *Nations, Law of.*) J. Jac. Moser was the first who treated the practical law of nations separately from the theoretical, in his Attempt at a Sketch of the Modern European Law of Nations in Times of Peace and War (in German, 10 vols., Frankfort on the Maine, 1777). See. also, Vattel, *Le Droit des Gens* (3 vols., recent edition, Paris, 1820); George Fr. von Martens, *Précis du Droit des Gens moderne de l'Europe;* and Charles Martens, *Causes célèbres du Droit des Gens*. The Germans have numerous recent works in this branch of science.

11. *Diplomacy.* See *Diplomacy.*

12. *Political practice* embraces whatever is necessary for the conduct of public affairs. In some European governments, in which all business is

transacted by means of writings drawn up with various formalities, the wording, &c. of these writings forms a subject of study, and various works have been written on the *chancery style*, so called; and in all governments, the study of a diplomatic style, and of the mode of transacting diplomatic business, belongs to it. See *Cours de Style Diplomatique* (2 vols., Dresden, 1823). The knowledge of parliamentary rules, the duties of committees, and all the forms usual in the administration of public business, fall under the head of political practice in representative governments.

POLL-TAX. See *Tax*.

POLLUX. See *Castor*.

POLLUX, Julius, was born in Egypt, in the latter part of the second century. He devoted himself early to letters, and settled at Athens, where he read lectures on ethics and eloquence. He became preceptor to the emperor Commodus, for whose use he drew up the catalogue of Greek synonymes in ten books, under the name of *Onomasticon*, the best edition of which is that of Amsterdam (1706, folio), by Wetstein. He died A. D. 238.

POLNITZ, Charles Louis, baron von, born in 1692, early displayed marks of talent, and travelled through Europe. Of his travels he gave an amusing account in his *Lettres et Mémoires* (ostensibly at Amsterdam, 1727). He was also the author of *L'Etat de Saxe sous Auguste III.* (1734), and of the well-known *Saxe Galante*; the *Histoire de la Duchesse d'Hanovre* (wife of George I.) is attributed to him. After his death (1775), appeared his *Mémoires sur les Quatre derniers Souverains de la Maison de Brandenbourg* (1791).

POLO, Giles (commonly called *Gil Polo*); a Spanish poet, born at Valencia in 1517. His inclination for poetry led him to abandon the profession of law, and his first works placed him among the best Spanish poets of his time. His reputation was established by his *Diana Enamorata*, a pastoral romance, partly in prose and partly in verse, intended as a continuation of the *Diana* of Montemayor. In invention, Gil Polo is not inferior to his predecessor, whom he surpasses in purity of style, and in the harmony and brilliancy of his verse. He died in 1572. Cervantes excepts the *Diana* of Gil Polo from his list of works condemned to be burnt.

POLO, Marco, a celebrated traveller of the thirteenth century, was the son of Nicholas Polo, a Venetian merchant, who, accompanied by his brother Matthew, had penetrated to the court of Kublai, the great khan of the Tartars. This prince, being highly entertained with their account of Europe, made them his ambassadors to the pope; on which they travelled back to Rome, and, with two missionaries, once more visited Tartary, accompanied by the young Marco, who became a great favourite with the khan. Having acquired the different dialects of Tartary, he was employed on various embassies; and, after a residence of seventeen years, all the three Venetians returned to their own country, in 1295, with immense wealth. Marco afterwards served his country at sea against the Genoese, and, being taken prisoner, remained many years in confinement, the tedium of which he beguiled by composing the history of the travels of his father and himself, under the title of *Delle Maraviglie del Mondo da lui vedute*, &c., the first edition of which appeared at Venice in 1496 (8vo). It has been translated into various languages, the best versions of which are one in Latin (Cologne, 1671), and another in French, published at the Hague in 1675, in two volumes. Polo relates many incredible things, but the greater part of his narrative has been verified by succeeding travellers, and it is thought that what he wrote from his own knowledge is both curious and true. He not only gave a better account of China than any previously afforded, but likewise furnished an account of Japan, of several islands in the East Indies, of Madagascar, and of the coast of Africa. He ultimately regained his liberty; but of his subsequent history nothing is known.

POLONAISE is a Polish national dance, which has been imitated, but with much variation, by other nations; also the tune to which it is danced.

The *Polonaise*, in music, is a movement of three crotchets in a bar, characterized by having every rhythmical cæsura not on the first, but the last crotchet of the bar. The Polonaise is generally written in two strains, and its movement, though majestic, is smooth and fluent.

POLTAVA; celebrated for the defeat of Charles XII. See *Pultawa*.

POLYÆNUS; a Greek writer, who flourished in the second century. He appears to have been by birth a Macedonian, and is principally known as the author of a work on military tactics entitled *Stratagemata*. Isaac Casaubon published an edition of it, which was reprinted at Leyden in 1690, with improvements. There is an English translation of it by Shepherd (4to, 1793).

POLYANDRIA (from πολυς, many, and ανηρ, a man) denotes the custom of one woman having several husbands,—a custom found with some uncivilized tribes. For the meaning of the term in botany, see *Plants*.

POLYARCHY (from πολυς, many, and αρχη, government) is sometimes used to denote any form of government in which many rule, whether it be an aristocracy or a democracy, in contradistinction to *monarchy*, in which one rules.

POLYBIUS, a Greek historian, was born at Megalopolis, in Arcadia, about 203 B. C. His father, Lycortas, was one of the leaders of the Achæan league, and the confidential friend of Philopœmen. Educated for arms and political life, he was sent, at the age of twenty-four years, as a member of an embassy to Ptolemy Epiphanes. When the war between Perseus, king of Macedonia, and the Romans, broke out, Polybius was sent to the Roman consul Marcius, to inform him of the resolution of the Achæans to join him with their forces. He remained some time in the Roman camp, and then returned with a commission from Marcius, to oppose the demand made by the commander Appius for more auxiliary troops to be sent to Epirus. About this time, the design of the Romans to make all the free states of Greece dependent became evident, and Polybius took part in all the measures for the preservation of their independence. When, therefore, after the subjugation of Perseus, the Romans used less disguise, Polybius found himself among the 1000 hostages whom the Achæans were obliged to deliver up to the Romans. His learning, virtues, and talents soon gained him the favour of some of the most distinguished senators, especially the two sons of Paulus Æmilius. The hostages were not dismissed until seventeen years had elapsed, when Polybius, who did not wish to see again his degraded country, remained in Rome, and entered into the service of Scipio Æmilianus. He accompanied him on his expedition to Africa, and proved a very useful counsellor to him. When the Achæans became involved in a war with the Romans, he hastened to the army of the consul Mummius to mitigate the fate of his countrymen. He was a witness of the destruction of Corinth, and of the change of Achaia into a Roman province. Amid these melancholy occurrences he preserved his patriotism and disinterestedness. He executed, to the satisfaction of both parties, the Romans and Greeks, the difficult commission of introducing the new form of government in the cities of Greece. The people of Achaia erected statues to him, one of which has this inscription:—"To the memory of Polybius, whose counsel, had it been followed, would have saved Achaia, and who consoled it in its adversity." He attended Scipio to the siege of Numantia, but, after the death of his great friend and benefactor, he returned to his native land, where he died in consequence of a fall from a horse, B. C. 121, aged eighty-two years.

Polybius is the author of a historical work from the beginning of the second Punic war to the overthrow of the Macedonian empire (fifty-three years). It consists of thirty-eight books, besides two introductory books, containing a sketch of the Roman history from the taking of Rome by the Gauls. Although the affairs of Rome are the chief subject, contemporary occurrences in other countries are also related, on which account Polybius gave it the title of a universal history (ιστορια καθολικη). We have of this great work only the five first books entire, and valuable fragments of the twelve following, together with the politics of Polybius, taken from the history of Constantine Porphyrogenitus, and examples of virtues and vices. The loss of the rest is very much to be regretted, as, in accuracy and fidelity of narration, and in extent of political and military knowledge, Polybius is surpassed by no historian of antiquity. To him is also attributed the introduction of didactic politics into history—that is, of that manner of writing history which, by intermingling views of the causes, occasions and effects of events, is a useful introduction to politics (πραγματα). On the other hand, his style is destitute of beauty, and can be read only for the matter. Livy has sometimes copied him. Cicero mentions a particular work of his on the Numantian war. The most valuable editions of Polybius are those of Casaubon (Paris, 1609), of Jac. Gronovius (Amsterdam, 1670, 3 vols.), republished by J. A. Ernesti, with Casaubon's Latin translation and a commentary (1764), and that of Schweighauser (Leipsic, 1789 to 1793, 9 vols.). The history of Polybius has been well translated into English by Hampton.

POLYCARP, according to tradition, a disciple of the apostle John, and one of the earliest bishops of Smyrna, finally defended the Christian faith, in the year 169, under torture, in being put to death during the persecution of the Christians under Marcus Aurelius. The people destined him to the wild beasts, but the judges condemned him to the flames. These, however, according to the legend, played harmlessly around him, in the shape of a swelling sail, and emitting a sweet fragrance. Seeing his body to be proof against the flames, the judges ordered one of the executioners to run him through with a sword. A white pigeon suddenly flew up, and the flames were extinguished by the blood that flowed from the wound. Thus Christianity had changed the heathened eagle which bore the soul of the Roman emperors to their kindred gods into an innocent dove; and a miracle was then performed, which was afterwards repeated at the funeral pile of the maid of Orleans. The Roman church consecrated the twenty-sixth of January to the memory of Polycarp. His Epistle to the Philippians is the only one of his pieces which has been preserved.

POLYCLETUS OF SICYON, about 430 B. C., one of the most celebrated Grecian sculptors, was a scholar of Agelades, and a rival of Phidias, to whom, however, he was inferior in fire and nobleness of conception. He was an architect, as well as Phidias, but excelled chiefly as a statuary in bronze. His principal merit is elegance. He devoted himself principally to youthful gymnastic figures and figures of females. Polycletus created the ideal of a youthful figure. (See *Sculpture*, and *Sculptors of the Ancients*.) He executed all the graceful attitudes of the gymnastics of youth. In the Doryphorus, he seems to have intended to exhibit a model or a canon. (See Winckelmann's works, 6th vol.) He is also said to have written a work on proportions. He made the Argive Juno of a colossal form, as if for a counterpart to Phidias's Jupiter, in ivory and gold, unveiled, with a crown of gold on her head, and a large arched eye, holding a sceptre, with a cuckoo in her left hand, and in her right, which was extended, a pomegranate. Polycletus also made small bronze figures, beautiful vessels and lamps. There are other artists of the same name.

POLYCRATES; ruler of Samos during the time of the elder Cyrus and Pythagoras. The Samians had till then been free, but he made himself master of the government by violence, and endeavoured to secure his power by every means, even by an alliance with the Egyptian king Amasis. His extraordinary success in all his undertakings induced Amasis, as Herodotus says, to admonish him to avert greater calamities by some voluntary sacrifice. Polycrates followed this advice, and cast his most valued jewel, a precious signet ring, into the sea, which was, however, found a few days after in the maw of a fish that had been sent to him as a present, on account of its remarkable size. This induced Amasis to renounce his alliance. In fact, to use the language of the ancients, Nemesis at last punished the arrogance of Polycrates in a dreadful manner. When he was on the point of making himself lord of all Ionia and the neighbouring islands, the Persian satrap Orontes, who considered himself injured by him, treacherously invited him to his palace, and crucified him, B. C. 522. Polycrates seems to have had much taste for learning and the arts, and greatly promoted the refinement of the Samians. Anacreon, his favourite, and the celebrator of his fame, lived at his court.

POLYDECTES. See *Perseus*.

POLYGAMY consists in a man's having more than one wife, or a woman's having more than one husband, at the same time. It was common among the barbarous nations of antiquity, with the exception of the Germans, who, as Tacitus observes, *prope soli barbarorum singulis uxoribus contenti sunt*. Among the ancient Britons, there was a singular kind of polygamy. Any number of men joined in a society together, as was perhaps requisite for mutual defence. In order to link this society closer, they took an equal number of wives in common, and whatever children were born were reputed to belong to all of them, and were accordingly provided for by the whole community. The ancient Medes compelled the citizens of one province to take each seven wives, and the women in another to have each five husbands, according as war had made extraordinary havoc in one quarter of their country among the men, or the women had been carried away by an enemy from another. Polygamy was also permitted among the ancient Greeks, when necessity seemed to require it, as in the case of the detachment of young men from the army of Lacedæmon, mentioned by Plutarch. It was also allowed among the Tuscans (12 *Athen.* 3). It was also defended by Euripides and by Plato, whose doctrine was rather a community of wives than a plurality. The ancient Romans never practised polygamy, though it was not forbidden among them; and Mark Antony is mentioned as the first who took the liberty of having two wives. From that time it became frequent in the Roman empire, till the reigns of Theodosius, Honorius and Arcadius, who prohibited it A. D. 393. After this, Valentinian permitted all his subjects to marry several wives, if they pleased; nor does it appear, from the ecclesiastical history of the times, that the bishops made any opposition to the introduction of polygamy. It did not, however, continue long.

Polygamy prevailed among the Jewish patriarchs, both before and under the Mosaic law, though it has been doubted whether that law permitted simultaneous plurality of wives (*Deut.* xxi. 15). But the state of manners had probably become reformed in this respect before the time of Christ; for, in the New Testament, we meet no trace of its practice. In the Christian code, there is no express law upon the subject. The words of Christ, however, in Mat. xix. 9, may be construed, by an easy implication, to prohibit polygamy; for if "Whoever putteth away his wife, and marrieth another, committeth adultery," he who marrieth another, without putting away the first, is no less guilty of adultery; because the adultery does not consist in the repudiation of the first wife, but in entering into a second marriage during the legal existence of the first. The passages in St Paul's writings which speak of marriage always suppose it to signify the union of one man with one woman. But, however this may be, polygamy has been as entirely disused, and universally prohibited in all Christian countries, as if Christianity had expressly forbidden it. Polygamy has been allowed under all the religions which have prevailed in Asia. By the laws of Mohammed, every Mussulman is permitted to have a plurality of wives. The Arabs, however, seldom avail themselves of this privilege.

In England, originally, the offence of polygamy was considered as of ecclesiastical cognizance only; and, although a statute of Edward I. treated it as a capital crime, it appears still to have been of doubtful temporal cognizance until the statute of James I., c. 11, enacted that persons guilty of polygamy should suffer death, as in cases of felony; but the benefit of clergy was not thereby taken away. By the statute 33 George III., c. 67, polygamy is punishable with transportation for seven years, or imprisonment. In the United States of America, the punishment is generally imprisonment for a longer or shorter period, fine, &c. By a constitution of Charles V. it was a capital crime, and, by the laws of ancient and modern Sweden, it is punished with death. By the Prussian code of 1794, polygamy is punishable by confinement in a house of correction or fort, for at least one and not more than two years.

The practice of polygamy has been defended by several authors in modern times. Montesquieu affirms that it is physically conformable to the climate of Asia. He has also suggested that the irregularity in the comparative number of each sex born in Asia, which is represented to be greatly superior on the part of the female side, is also an argument in favour of this practice; but there is good reason for denying the reality of this supposed inequality. In the year 1780, the reverend Mr Madan published his *Thelypthora*, in which he attempted to vindicate polygamy, and proposed the introduction of licensed polygamy, in case of female seduction, as a remedy for prostitution. He was ably answered by a writer in the Monthly Review, vol. 63, p. 328.

POLYGLOT (from πολυς, many, and γλωττα, language); a work which contains the same matter in several languages. It is more particularly used to denote a copy of the Holy Scriptures, in which two, three, or more translations are given, with or without the original. Polyglots are of great service for the understanding the Scriptures, and were early undertaken by theologians. The first great work of the sort is the Complutensian polyglot, prepared by several learned men, under the patronage of cardinal Ximenes. Great care and pains were taken in procuring early manuscripts of the text and of the translations. It was splendidly printed 1514—17), in six folio volumes, at Alcala de Henares (q. v.), in Latin, *Complutum*, whence its name. It contains the Hebrew text of the Old Testament, with the Vulgate, the Septuagint, a literal Latin translation, a Chaldee paraphrase (which is also accompanied by a Latin translation). Another celebrated polyglot is that of Antwerp, called the *Royal Bible*, because Philip II. of Spain bore part of the cost of publication. It was conducted by the learned Spanish theologian, Benedict Arias Montanus, who was assisted by other scholars. It appeared at Antwerp, in eight folio volumes (1569—72), and, besides the Hebrew text, contains the Latin Vulgate, the Septuagint (with a literal Latin translation), several Chaldaic paraphrases (Targums), also accompanied by a Latin translation, and the New Testament in the original Greek, with the Latin Vulgate, and a Syriac translation in Hebrew and Syriac letters (also with a Latin translation). Still more celebrated is the Paris polyglot, executed principally under the direction of Gui Michael le Jay (an advocate to the parliament, who expended his whole fortune on the object), by several distinguished Orientalists and critics. It appeared in 1645, in ten folio volumes, and contains, in addition to the contents of the Antwerp polyglot, a Syriac and an Arabic translation (with Latin), and also the Samaritan pentateuch (a Samaritan text, with a translation), and likewise an Arabic translation of the New Testament, with a Latin translation of the same. Finally, the London or Walton's polyglot, in ten languages, appeared in six volumes folio, with two supplementary volumes (London, 1654—57). It was conducted under the care of Bryan Walton (q. v.), afterwards bishop of Chester, and contains all that is in the Paris polyglot, but with many additions and improvements. It contains the original text according to several copies, with an Ethiopic and a Persian translation, and the Latin versions of each. Cromwell patronised the undertaking. Besides these four great polyglots, there are several of parts of the Bible, particularly of the Psalms.

POLYGNOTUS OF THASUS, one of the most distinguished Greek painters, flourished from 450 to 410 B. C., embellished Athens with his pencil, and was rewarded with the citizenship. Cimon, the demagogue, and rival of Pericles, employed him to decorate the Pœcile. He was also the favoured lover of the beautiful Elpinice, sister of Cimon. Micon and Panænus assisted him in painting the Pœcile. His two principal pictures there represented the Greeks before Troy; the subject of one of them was the assembly of the chiefs after the rape of Cassandra; of the other, the captive Trojan females, in the midst of whom was Cassandra. In the *Lesche* (hall), at Delphi, he painted the Conquest of Troy, and the Regions of the Dead, which are described by Pausanias. In a portico of the Parthenon there were also several easel-pieces, relating to the Trojan war. In the temple of Castor and Pollux was a painting representing the abduction and marriage of the daughters of Leucippus, and in the propylæa were several pictures. His works were probably on wood. Polygnotus is represented as being the first who made painting independent of sculpture, and gave life, motion, character and expression (whence his surname ἠθογραφος) to the countenance, skilful disposition to the drapery, and proportion to the figures, and he is said to have been the first who painted *tetrachromes* (pictures with four colours). With him began the grand and lofty style in Greek painting.

POLYHALITE; the name of a mineral species, bestowed in allusion to the many salts which it contains. It occurs in coarsely fibrous masses of a reddish white colour, and a pearly lustre; specific gravity 2.77; hardness not much above that of gypsum. Its constituents are as follows:—

Hydrous sulphate of lime, ...	28 25
Anhydrous do.	22.42
Anhydrous sulphate of magnesia, . .	20.03
Sulphate of potash, ...	27.07
Muriate of soda, ...	.19
Red oxide of iron, ...	.34

It occurs in the salt mines of Ischel, in Upper Austria.

POLYHEDRON, or POLYEDRON; a body or solid contained by many rectilinear planes or sides. When the sides of the polyhedron are regular polygons, all similar and equal, then the polyhedron becomes a regular body, and may be inscribed in a sphere; that is, a sphere may be described about it, so that its surface shall touch all the angles or corners of the solid. There are but five of these regular bodies, viz. the *tetrahedron*, the *hexahedron* or cube, the *octahedron*, the *dodecahedron*, and the *icosahedron*.

POLYHISTOR (from πολυς, much, and ἵστωρ, knowing); a scholar who is acquainted with all the chief branches of science. Formerly it was possible to be well versed, at the same time, in law, theology, medicine, &c. (as in the case of Leibnitz, and several scholars of eminence before him.) In the present advanced state of science, it is impossible to be a *polyhistor* without the sacrifice of thoroughness. *Polyhistor* is also used for a scholar, who, besides his peculiar branch, has a general knowledge of most others. See *Morhof*.

POLYHYMNIA, or POLYMNIA; according to the later poets, the muse of lyric song or of music, to whom is attributed the invention of mimes and pantomimes. The Grecian artists represented her covered with a veil, and in a meditating posture. Her attributes are the lyre and the plectrum. She places the forefinger of her right hand on her mouth, or holds a scroll.

POLYMIGNITE; the name of a mineral recently found in Norway. It is black, brilliant, and crystallized in small prisms, long, thin, with rectangular bases, the edges of which are commonly replaced by one or several planes. Specific gravity, 4.806. It scratches glass. Fracture conchoidal, without indications of cleavage; lustre semi-metallic. Alone, before the blow-pipe, it undergoes no change, but melts easily with borax. Its composition is as follows:—

Titanic acid, ...	46.3
Zirconia, ...	14.4
Oxide of iron, ...	12.2
Lime, ...	4.2
Oxide of manganese, ...	2.7
Oxide of cerium, ...	5.
Yttria, ...	11.5
Traces of magnesia, potash, silex and oxide of tin,	96.3

It is found in the zircon sienite at Fredericksvœrn.

POLYNESIA (from πολυς, many, and νησος, island); the name given by geographers to the great body of islands scattered over the Pacific ocean, between Australasia and the Philippines, and the American continent. It extends from lat. 35° N. to 50° S.; and from lon. 170° to 230° E., an extent of 5000 miles from north to south, and of 3600 from west to east. It includes, therefore, the Sandwich islands, the Marquesas, Navigator's, Society, Mulgrave, Friendly, Ladrone, and Pelew isles, the Carolines, Pitcairn's island, &c. *See these articles*, and also, *Australia*, *Oceanica*, and *Pacific Ocean*.

POLYNICES. See *Eteocles*, and *Thebes*.

POLYPHEMUS, son of Neptune, the most famous of the Sicilian Cyclops, is described by Ulysses (*Odyssey* ix.), as a giant, living by himself in a cave, and feeding his flocks. Ulysses (q. v.) and his companions, having unwarily taken refuge in his cave, were found there by Polyphemus, when he returned home at night, and shut up the mouth of the cavern with a large stone. Having seized two of the strangers, he ate them for supper, and the next morning made a breakfast of two more of them, after which he drove out his flocks to pasture, and shut up the unhappy captives by closing the entrance of his cave. Ulysses then contrived a plan for their escape. Having sharpened the club of the Cyclops, he intoxicated the monster with wine, and, as soon as he fell asleep, bored out his eye. He then tied himself and his companions under the bellies of the sheep, in which manner they passed safely out in the morning. Polyphemus was the lover of the nymph Galatea, but the nymph despised his offers, and preferred Acis, who was killed by his jealous rival. See *Galatea*.

POLYPI, in natural history; this forms the thirteenth class of the invertebrate animals, and is one of the largest and most remarkable of the animal kingdom. The animals which it comprehends are gelatinous, with elongated contractile bodies, and an alimentary sac with but one opening; a distinct and terminal mouth, surrounded with tentacula, or radiated lobes; the greater part of which are adhering together, and forming compound animals. These animals are of the simplest kind, possessing an organization so low in the scale of being that they appear almost incapable of reproducing their kind. They are destitute of a head and eyes, and are provided with no organs fitted for circulation, respiration, or locomotion. The bodies of these animals appear only a homogeneous mass, constituted of a gelatinous and irritable cellular tissue, in which the vital fluids move in a slow and protracted course. The whole animals of this extensive class are provided with an internal cavity or stomach, and some of them with indistinct traces of hollow canals and ovaries. The body is usually of a cylindrical or conical form, of a gelatinous or transparent texture; the mouth is the only opening, and is surrounded by tentacula, varying in form and number. So universally diffused is the principle of life through the simple structure of the polypi, that portions of them may be severed, and these portions, if allowed to remain in their proper element, will soon become perfect animals, with all the functions fully developed, as in the individual from which they were cut off. The hydra will sometimes of its own accord split into two; each division becoming independent of the other, and growing to the same size as the original hydra. Trembley found that different portions of one polypus might be ingrafted on another, by cutting their surfaces and pressing them together; for by this means they quickly unite, and become a compound animal. When the body of one hydra is introduced into the mouth of another, so that their heads are kept in contact for a sufficient length of time, they unite and form but one individual. A number of heads and bodies may thus be joined together artificially, so as to compose living monsters more complicated than the wildest fancy has conceived. Most of the polypi form compound animals, attached to one another by lateral appendages, or by their posterior extremity, participating in a common life, while at the same time they enjoy their individual and independent existence. Many of this tribe are supposed to be gemmiferous, or to extend the race by buds in the same manner as plants, while others propagate their species by means of eggs. In the lowest races of polypi, the distinctive characters of animal life are so slightly developed, that there is much difficulty in distinguishing them from the cryptogamic families of the vegetable kingdom. The resemblance of these animals to plants consists in this, that from the egg is formed a bulb, which shoots up into a stem, and sends off branches: there is also a root, which, however, is merely the organ of attachment, affording no nourishment to the animals. Being thus immovably fixed to a particular spot, they have no other means of providing themselves with food, but by their long tentacula, which act as arms to convey the food to the mouth; these members only are capable of voluntary motion. The vegetable structure of this class, long obtained for them the name of animal plants. Some of them, however, float about in the ocean as the *pennatula*, or sea pens.

About the year 1699, Imperati and Gesner had remarked the animal structure of polypi or corals; and Peysonnell, in 1727, was the first who ascertained the living inhabitants of those stony and horny structures, and his discoveries have been confirmed by Trembley's treatise upon the hydræ, published in 1740; and subsequently by Reaumur, Jussieu, Donati, Ellis, Boccone, Degeer, Baster, Cavolini, Pallas, Linnæus, and Cuvier. All the animals of this class were placed by Linnæus, as an order of his class *Vermes*, under the distinctive appellation of Lithophytæ. The sagacity of that great naturalist, enabled him to form a superstructure, upon which has been built the more improved,—because better known classifications of Pallas, Bruguière, and Lamarck; whose arrangement we mean to follow, as being more comprehensive than that of Cuvier, who, divides his class polypi into two orders; the first of which embraces those that are naked, and the second, such as live in polypiferous masses, formed by the united labours of the community. These he subdivides into many families.

Minute as the beings are which construct and inhabit those stony masses called corals, they form one of the largest, and undoubtedly the most singular of the whole classes of animated being. Such is the enormous accumulation of the stony envelops formed by them in tropical seas, that islands are produced, coasts extended, and harbours blocked up by them. It was the opinion of Lamarck, that it was these minute beings who originally formed the calcareous strata of the globe.

In contemplating the structure of the polypi, the hydra for example, we find their nutritive organs the simplest of all possible forms; consisting of a mere stomach adapted to receive and digest food, without any other apparent organ, being destitute of brain, nerves, or organs of sense; nor is there the slightest appearance of any thing corresponding to lungs, heart, or even vessels of any kind. We have given a magnified representation of the hydra, laid open by a longitudinal section, pl. 75, f. 79, exhibiting the cavity into which the food is received and digested. The walls of this cavity must be adapted not only to prepare and pour out the fluids by which the food is digested, but also to permit of the transudation through its substance,—probably by means of invisible pores,—of the nutritious particles thus extracted from the food for the purpose of its being incorporated and identified with the gelatinous pulp, of which the body appears wholly to consist. The researches of Trembley have brought to light the extraordinary fact, that not only the internal surface of the polypus is endowed with the power of digesting food, but that the same property belongs also to the external surface, or what we might call the skin of the animal. He found that by a dexterous manipulation, the hydra may be completely turned inside out, like the finger of a glove, and that the animal, after having undergone this singular operation, will very soon resume all its ordinary functions, just as if nothing had happened. It accommodates itself in the course of a day or two to the transformation, and resumes all its natural habits, eagerly seizing animalcules with its tentacula, and introducing them into its newly formed stomach, which has for its interior surface what before was the exterior skin, and which digests them with perfect ease. The truth of this wonderful discovery was subsequently confirmed by Bonnet, and Spallanzani.

Still more complicated are the forms and economy of the aggregated polypi, which prolific nature has spread in countless multitudes, over the rocky shores of the whole globe. These grow in the form of plants, and are supported on one common stem, with widely extended flowering branches. These many-headed monsters present myriads of open mouths, each surrounded by single or numerous rows of tentacula, which are extended to catch their prey; these are provided with a multitude of cilia, which, by their incessant vibrations, determine currents of water to flow towards their mouths, carrying with them the floating animalcules on which the entire mass of polypi subsists.

Each mouth leads into a separate stomach, whence the food, after its digestion, passes into several channels, generally five in number, which proceed in different directions from the cavity of each stomach, dividing into many branches, and being distributed over all the surrounding portions of the flesh. These branches communicate with similar channels, proceeding from the neighbouring stomachs, so that the food which has been taken in by one of the mouths, contributes to the general nourishment of the whole mass of aggregated polypi.

The polypi appear in general not to be provided with any distinct channels for conveying aerated water into the interior of their bodies, so that it may act in succession on the nutritive juices, and, after performing this office, may be expelled, and exchanged for a fresh supply. It has accordingly been conjectured, on the presumption that this function is equally necessary to them as it is to all other animals, that the vivifying influence of the surrounding element, is exerted through the medium of the surface of the body. Thus it is very possible that in polypi, while the interior surface of the sac digests the food, its external surface may perform the office of respiration; and no other mode of accomplishing this function has been distinctly traced in the animals of the order Acalepha, which are treated of under the article *Echinodermata*.

The form of the shelly covering which invests most of the polypi admits of almost infinite variety. In some it encloses the flesh in a general sheath, leaving only an opening at the end, sufficient for the expansion of each set of tentacula, surrounding the various mouths of the respective animals. In some species these tubes are placed parallel to each other, in the manner of the pipes of an organ, with transverse partitions at regular intervals for their support; as exemplified in the *Tubipora Musica*, pl. 75, f. 34 and 66. This last figure represents a portion of the tubes highly magnified, and laid open to show the polypi in their interior. Sometimes the tubes are united together endwise, like the branches of a tree, leaving lateral apertures for the animals to extend their tentacula through, as exemplified in the *sertularia frutescens*, pl. 75, f. 3 and 10. In some species the horny base is formed into a number of cells, each of which answers the purpose of protecting its respective polype. These are usually situated at the extremity of the branches, and have all the appearance of flowers, as may be seen in the *tabularia ramosa*, pl. 75, f. 59, 60. The different species of the genus *Flustra*,—as will be seen in the species *carbacea*, pl. 75, f. 61, and F. *foliacea*, f. 12,—have the cells excessively minute. These are extended over a flat membraneous substance, having all the appearance of the leaves of plants. These cells are formed in very regular rows, as in the magnified representation of F. *foliacea*, f. 1, and are arranged with as much regularity as the cells of a honeycomb. Nearly the whole of the animals which constitute the other polypiferous masses have an internal inorganic base of support, constituting a kind of skeleton or axis; the mouths of the polypi being developed at intervals over the surface of the fleshy layer by which this skeleton is covered. This is especially the case with the genera *Gorgonia*, *Antipathes*, *and Corallium*, as they bear the strongest similitude to the branched forms of the stems of vegetables. The flesh contains grains of calcareous matter, which, in the dried specimens, adhere to the surface of the stems. Plate 75, f. 6, is a branch of *Coralium rubrum*, exhibiting the appearance presented by the polypi in their expanded and contracted conditions. F. 7 is the polype of the same, greatly magnified. In many instances the polypi are located in cup-like depressions, situate in the surface of the calcareous axis, which protects them considerably. In the genus *Madrepora* these depressions are intersected by radiating *plates*, adapted to the number and construction of the tentacula; and in the *Millepora* the cells are closer and more minute, and do not exhibit any of the star-like radiations. In some species the plates have more of a parallel arrangement; and in others they form a reticulated appearance.

The materials of which the axis is composed are invariably arranged in concentric layers, thus indicating that their deposition has been successive, and the surface is always marked by longitudinal lines corresponding to the figure of the animal covering the flesh. In some genera the stem consists of horny and calcareous parts alternately disposed, composing a jointed structure. This has been by some naturalists considered an approximation to an articulated skeleton; as it is susceptible of considerable flection, and yields readily to the currents or waves, without being broken. An example of this structure is seen in the *Isis Hippuris*, pl. 75, f. 21.

Almost the entire class of polypi are attached, by the root of the stem or base, to submarine rocks or other extraneous bodies. The roots are possessed of a very strong adhesive quality.

The reproduction of all the adhesive polypi depends upon the detachment of gemmules,* or imperfectly formed portions of their soft substance. These gemmules are possessed of active powers of locomotion, apparently for the sole purpose of seeking a place whereon to raise its future habitation at a distance from its parents. This situation once chosen, it is immovably fixed to that spot, during its natural life. In the earlier state these gemmules appear on the surface of the parent animal, in the form of small specks, which are visible to the naked eye. In the course of a few months they enlarge in size, and each becomes pyriform, and are observed to protrude from the sides of the internal canals of the parent, adhering by their narrow ends. This form in particular applies to the young of sponges. Shortly after, they are freed, the one after the other, and are borne along by the currents of fluid, which are quickly passing out of the larger openings. F. 73, pl. 75, represents one of these detached gemmules. Were these devoid of life, they would naturally sink to the bottom by their own gravity, but on the contrary they spontaneously swim about for two or three days; with their broad end forwards. These gemmules, upon microscopic examination, are found to be about two-thirds covered with short cilia, which are in constant and rapid motion: they are extremely minute and transparent, broadest at the base, and tapering to almost invisible points. The strokes of these cilia are made without any regular order, but conspiring to propel the gemmule with the broad end forwards, but without seeming to have an apparent object in view, by a slow gliding motion, quite unlike the zigzag course of animals in search of prey. They appear, however, to have a consciousness of impressions made on them; for if they come in collision with each other, or if they strike against any object, the motion of their cilia is for a short time suspended; they wheel round the spot for some seconds, then renew their vibratory motion, and proceed in their former course.

It is by the narrow extremity that these gemmules become adherent, which soon begins to expand itself laterally, so as to form a broad base of attachment. While this is proceeding the cilia continue to move rapidly, but their motions soon become languid, and in a very few hours cease entirely to move, and finally disappear, being no longer of use. The same mode of proceeding is common to the gemmules of all the class polypi, except that there is a variety in the head of the gemmules which swims first. The time of their remaining in a free condition varies with the species, from a few hours to three days.

The tentacula of polypi are exquisitely sensible, and are frequently seen, either singly or collectively, curving their extremities towards the mouth, when any minute floating body comes in contact with them. During the time a polype is expanded, a constant current of water is directed towards the mouth; the currents are never produced by the motions of the tentacula themselves, but are always the effects of rapid vibrations of the cilia placed on the tentacula. The polypi of the *Flustra carbasea*, for example, f. 62, pl. 75, have each tentacula, provided with a single row of cilia, extending along both the lateral margins, from their base to their termination; as we have represented at f. 63, in a portion of one of their tentacula, highly magnified. Every polype is furnished with twenty-two tentacula, and there are about fifty cilia on each side of a tentaculum, so that every individual polype has no less than two thousand two hundred cilia. Every square inch contains about one thousand eight hundred cells; the branches of an ordinary specimen present about ten square inches of surface, so that an ordinary specimen of this species presents a congregation of not less than eighteen thousand polypi;

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* The word *Gemmule* is taken from the Latin word *gemma*, a bud; and its meaning, as applied to polypi, is that of a young animal, not contained within an envelop, or egg.

with three hundred and ninety-six tentacula, and thirty-nine millions six hundred thousand cilia; while other species undoubtedly contain more than ten times these numbers. Dr Grant has estimated that there are about *four hundred millions* of cilia on a single *Flustra foliacea!* the species which we have represented, f. 12. We have given a representation of a gemmule of the *Flustra carbasea*, pl. 75, f. 64.

It is still an unsettled point whether the aggregated mass is to be considered as one individual, endowed with a common principle of life and growth, or whether each mouth is to be regarded as the organ of a separate animal. Dr Grant is of opinion that the detached polypi called *pennatula*, or sea pens, f. 14, pl. 75, do not possess a voluntary power of locomotion, but that they are carried along by the currents of the ocean. Indeed, none of all this extensive tribe of beings which are invested in a stony covering, or which have a horny or calcareous axis, have the power of locomotion; and it is not until we descend to animals divested of these, that we can trace animals having this power. The fresh-water polypi, called *hydra*, are locomotive. These animals present us with the simplest kind of structure which has yet been ascertained. The hydra consists simply of a fleshy tube, open at both extremities, and the aperture of the tube serving as a mouth, which is situate in the more dilated end, and this mouth is provided at its margin with a single row of tentacula. Looking to this animal, we may suppose that nature has formed it, to prove that animal life may be carried on without the aid of the complicated machinery which she has given to the higher orders of creation. The hydra can change place at will. F. 69, pl. 75, represents the *hydra viridis*. This animal has the power of fixing itself in an erect position by the foot, and if it wishes to change place, it slowly bends till its head touches the plane on which it is moving, and adheres to it by the mouth, or by one or two of its tentacula; the foot is then detached, and by a curve of the body placed close to the head, where it is again fixed, preparatory to a new step, which it performs by a repetition of the same movements.

Sponges, in their general aspect, have much the appearance of plants, and they were by many regarded as such; but it has been satisfactorily ascertained that they are composed of soft flesh, intermixed with a tissue of fibres, some of which are solid, others tubular, and the whole being curiously interwoven into a kind of network. It will be perceived, on examining f. 70, pl. 75, that every part of a living sponge presents to the eye two kinds of orifices, the larger being somewhat round in its shape, with the margins raised, forming projecting papillæ; the smaller being much more numerous, exceedingly minute, and are usually termed the pores of the sponge.

For many ages, indeed, so far back as the time of Aristotle, who died 322 years before the birth of Christ, sponges were supposed to be so sensitive that they shrunk from the touch; and later naturalists asserted that, if punctured by sharp instruments, they would exhibit visible tremulous motions. But Dr Grant has most effectually refuted this error, by subjecting sponges to the most severe experiments, such as lacerating, puncturing, burning, or otherwise wounding their texture by the application of corrosive chemical agents. He has discovered the true nature of the currents of fluid issuing at different points, which he thus graphically describes:—"I put a small branch of the *spongia coalita*, with some sea water, into a watch-glass, under the microscope, and, on reflecting the light of a candle through the fluid, I soon perceived that there was some intestine motion in the opaque particles floating through the water. On moving the watch-glass, so as to bring one of the apertures on the side of the sponge fully into view, I beheld, for the first time, the splendid spectacle of this living fountain, vomiting forth, from a circular cavity, an impetuous torrent of liquid matter, and hurling along, in rapid succession, opaque masses, which it strewed every where around. The beauty and novelty of such a scene in the animal kingdom, long arrested my attention, but after twenty-five minutes of constant observation, I was obliged to withdraw my eye from fatigue, without having seen the torrent, for one instant, change its direction, or diminish, in the slightest degree, the rapidity of its course." It thus appears that the large orifices on the surface of a living sponge are destined for the discharge of a constant stream of water from the interior of the body. We have attempted to represent the particles thrown out by these currents in f. 70. These currents, issuing from the larger orifices, are best seen by placing the living animal in a shallow vessel of sea water, and strewing a little powdered chalk over the surface, the motions of which render the current very sensible to the naked eye. It is by the myriads of minute pores, which exist in every part of the surface, that this water enters, conveying with it the materials necessary for the subsistence of the animal. These pores conduct the fluid into the interior, where, after percolating through the numerous channels of communication which pervade the substance of the body, it is collected into wider passages, terminating in the focal orifices above described, and is finally discharged. The mechanism by which these currents are produced is involved in much obscurity.

The genus *vorticella* is constituted of a small tribe of animals which differ from the polypi in one particular, namely, that of being destitute of tentacula, and having cilia only, surrounding the margin of a bell-shaped body, which is mounted upon a long, slender peduncle. The animals of this genus are always attached to some extraneous body by this footstalk, as represented in *vorticella polypina*, pl. 75, f. 75, but have the power of moving about in all directions, to the extent of the range of the footstalk. Currents are, as usual, excited by the vibrations of the cilia, and these are the efficient instruments of progressive motion. The ordinary position of the peduncle of the vorticella is spiral, but it can extend it quite in a straight line when in search of food; but it suddenly retreats from danger, by resuming the spiral folds of its peduncle.

Lamarck arranges the polypi under five orders, with the following characters:—

I. Polypi Natantes.—Polypi provided with tentacula, united in a common fleshy mass, placed on an axis, free, and floating in the water.

II. Polypi Tubiferi.—Tentaculated polypi united in a common fleshy body, without any solid axis, and covered with tubiform cylinders.

III. Polypi Vaginati.—Polypi with tentacula, always fixed in an inorganic covering, and forming in general compound animals.

IV. Polypi Denudati.—Tentaculated polypi not forming a common envelop, fixed either constantly or spontaneously.

V. Polypi Ciliati.—Polypi without any tentacula; but instead of them, vibratile ciliæ, at or near the mouth.

ORDER I.—POLYPI NATANTES.

Polypi united in a common fleshy body, or congregated mass, free, elongated, enveloping an inorganic axis, cartilaginous, osseous, or stony; each polypus provided with tentacula placed around the mouth, and radiating.

The animals of this order are congregated on a common body, in which they all participate, while each appears to enjoy a separate existence, and distinct powers of volition.

The common body has the appearance of a naked fleshy mass, with the polypi protruding from its surface, and in the centre is placed an inorganic axis, resulting from some deposition of the animals, in the same manner as the outer covering in the other orders. Some of these compound animals float freely in the water, and others remain at the bottom in the mud or sand. Many of them diffuse a vivid phosphorescent light.

Umbellularia Greenlandica. Pl. 75, f. 13. Body free, consisting of a long simple stem, with a bony inarticulated axis, enveloped by a fleshy membrane; polypi large, congregated in an umbellate mass, each provided with eight ciliated tentacula. Stem slender above and lengthened, the polypi crowded on an umbel at the apex. Inhabits the Northern Ocean.

Virgularia. Body free, filiform or linear, greatly elongated, partly surrounded by polypiferous pinnulæ, and enveloping a stony axis; pinnules numerous, small, distichous, transverse, and surrounding the stem at the top. Inhabits the Northern Ocean.

Renilla. Body free, depressed, kidney-shaped, placed on a pedicle, with one of the faces polypiferous, and striated rays on the other; polypi provided with six rays each.

Pennatula phosphorea. Pl. 75. f. 14. Body free, fleshy, penniform, pinnated above, with the lower part of the stem naked, and containing a cartilaginous or bony axis; pinnulæ distichous, open, depressed, plicated, and polypiferous in their upper margin; polypi with radiated tentacula. Fig. 65 represents some of the polypes greatly magnified. Inhabits the British seas.

Funiculina. Body free, filiform, very simple, long, fleshy, and provided with warts, or polypiferous papillæ, arranged in longitudinal rows; axis slender, horny, or of a substony consistence in the centre; polypi solitary, placed upon each wart. Inhabits the American ocean.

Veretillum. Body free, fleshy, simple, cylindrical, polypiferous above, and with the base naked, and more or less coriaceous; polypi seated, and thickly studded on a body common to the community; each provided with eight ciliated tentacula.

ORDER II.—POLYPI TUBIFERI.

Polypi united in a common fleshy body, either simple, lobed, or ramified, and constantly fixed at its base; destitute of any solid internal axis; surface entirely or in part covered with tubiform cylinders, rarely retractile; mouth terminal, provided with eight pectinated tentacula.

The tubiferous polypi always exist in the form of a fleshy subgelatinous body, invariably fixed by their base. They are more or less simple, convex, lobed, or slightly ramified. The upper part of the surface of their body is covered with a vast number of small tubiform movable cylinders; having at their summit a roundish sub-octagonal mouth surrounded by eight pectinated tentacula.

Lobularia digitata. Pl. 75, f. 15. Common body of a fleshy consistence, elevated upon the base, but seldom supported by a short stem, simple, or provided with lobes; surface thickly studded with polypi, which are totally retractile, cylindrical, with eight external grooves, and eight pectinated tentacula. Inhabits the coast of Europe. Fig. 16 is a magnified view of a portion of this species.

Cliona. Of a fleshy, irritable substance, provided with siliceous spicula; generally embedded in the cavities of shells, and stretching out contractile papillæ, on the margin of which are placed cylindrical polypi, furnished with eight tentacula. Inhabits empty oyster shells on the British coasts.

Ammothea. With the common body divided into many short and branched stems, the last branches clustered, ovalconoid, and studded with polypi, which are not retractile; body short, with eight pectinated tentacula placed on the sides. Inhabits the coasts of the Red Sea.

Xenia. The common body provided with thick, somewhat short, naked stems, emanating from the base, and divided at their summit, polypiferous at their extremity; polypi not capable of retractility, cylindrical, fasciculated, in the form of an umbel, and clustered at the summit of the branches into globular heads, provided with eight large deeply pectinated tentacula.

Anthelia. Common body spread out in a thin plate, or depressed over marine substances; polypi destitute of retractile powers, protruded, straight, and crowded, over the surface of the common body; provided with eight pectinated tentacula. Inhabits the shores of the Red Sea.

ORDER III.—POLYPI VAGINATI.

Each individual polype tentaculated, constantly fixed in an inorganic body, or sheath, which completely envelops them, and forming in general compound animals.

This is the most extensive class of polypi, and is divided into seven sections. The animals are very delicate, transparent, and extremely contractile, usually fixed in an inorganic body of their own formation. This calcareous mass is increased in size with every successive generation; and these, in the course of time, accumulate to such a size, that they raise islands in the midst of the ocean. The cells are short, long, or tubular, the orifice sometimes irregular, and at others regular; the interior walls, being simple, longitudinally striated, or lamellated, and stelliform.

SECTION I.

The polypiferous masses composed of two distinct parts; the *first* consisting of numerous horny fibres, either in fasciculi, radiated, interlaced, crossed, or fitted together; the *second* is composed of a fleshy or gelatinous pulp; covering, enveloping, or attaching the fibres, containing the polypi, and assuming in drying a consistence more or less firm.

Alcyonium. The polypiferous masses are polymorphous, soft, or fleshy, when recent; but somewhat coriaceous and firm when dried; composed of small, horny fibres, interlaced, and agglutinated together by means of a persistent pulp; osculi usually apparent, and variously disposed at the surface; polypi generally provided with eight tentacula.

Geodia. The polypiferous mass free, fleshy, tuberous, hollow interiorly; hard when dry; the whole exterior surface porous; lateral face, with a cluster of isolated orifices larger than the pores.

Tethia. With a knotty subglobular polypiferous mass, the interior with numerous, fasciculated fibres, radiating from the interior to the circumference, and agglutinated together by a pulp; crust provided with horizontal cells; osculi caducous, and seldom perceptible.

Spongia tubulosa. Pl. 75. f. 5. Polypiferous mass soft, gelatinous, very flexible, and fixed; the cartilaginous matter supported by calcareous or siliceous spicula; pores excessively numerous and irregular. The spicula are represented at figs. 71 and 72, pl. 75. It will be seen by the *Spongia coalita*, pl. 75, f. 70, that there are two kinds of orifices; the larger having a rounded shape, provided generally with raised margins, which form projecting papillæ, the smaller being much more numerous, exceedingly minute, and constituting what are termed the pores of the sponge.

Flabellaria pavonia. Pl. 75, f. 17. The polypiferous mass is caulescent, fan-shaped, incrusted, frequently divided, with the expansions depressed, subarticulated, and polypiferous; stem cylindrical, short; the tissue composed of interlaced fibres; articulations somewhat kidney-shaped; broader than long, upper margin rounded and sinuous. Inhabits the seas of America.

Penicillus capitatus. Pl. 75, f. 18. Polypiferous mass, supported on a simple, exteriorly incrusted stalk, filled interiorly with many horny fasciculated fibres, and divided at its summit into a cluster of filiform dichotomous, articulated branches. Fig. 19 shows the articulations magnified.

SECTION II.

The polypiferous masses branched like plants, and composed of two kinds of substance, namely, a central solid axis, and a fleshy incrustation, which invests and contains the polypi; axis inorganic, corneous, or stony; when dried the polypiferous crust is porous, cellular, and friable.

Corallina corniculata. Pl. 75, f. 11. Polypiferous mass adherent, greatly branched, having a central axis, and an interrupted incrustation; axis filiform, inarticulate, solid, cartilaginous, or horny; incrustation calcareous, dense, united at the surface, and destitute of distinct cells, interrupted, and as if jointed longitudinally. The animals unknown. Inhabit the American and European seas. Fig. 4 is a magnified view of some branches.

Gorgonia verriculata. Pl. 75, f. 8. Polypiferous mass branched and adherent, having a central axis and an outer bark; axis fixed at the base, caulescent, branched, externally substriate, solid, horny, and flexible, the fleshy covering enveloping the axis and branches, and in its fresh condition containing polypi; when dried it is spongy, porous, and friable; invested by superficial or projecting cells. Indian seas.

Antipathes spiralis. Pl. 75, f. 20. Polypiferous mass adherent, branched; consisting of a central axis and outer envelop; axis provided with a foot, and fixed by the base, caulescent, simple, or branched; corneous, solid, flexible, and usually rough, with small spines; envelop gelatinous, polypiferous, covering the axis and its branches when alive, but disappearing when removed from its native element. Indian ocean.

Isis hippuris. Pl. 75, f. 21. Polypiferous mass arborescent, fixed, composed of a central, branched, jointed axis, forming stony striated articulations, horny between the joints, and an outer envelop, which, in the fresh state, contains polypi, but which disappear when out of the water. Indian ocean.

Melitæa. Adherent, tree-shaped, having a jointed knotty axis, and a persistent envelop; central axis branched, caulescent, and formed of stony substriated joints, with spongy, gibbous intervals; envelop cortical; containing polypi when in the water; thin, celliferous, and persistent when dried.

Corallium rubrum. Pl. 75, f. 6. Adherent, branched, stiff, and devoid of articulation; axis caulescent, branched, stony, and solid, with the surface striated; envelop soft and fleshy in the recent state, in which are lodged the polypi; when dead, thick, porous, and red; mouth of the polypi provided with eight ciliated and radiated tentacula. Fig. 7 represents one of the polypi greatly magnified. Indian ocean.

SECTION III.

With stony polypiferous masses, having star-shaped, or waved laminar furrows.

1. With Lateral Stars, or spread over the surface.

Oculina prolifera. Pl. 75, f. 22. Polypiferous mass of a stony consistence, generally with adherent, smooth, thick, and very short branches; some of the star-shaped mouths terminal, the others lateral and superficial. Northern ocean.

Seriatopora subulata. Pl. 75, f. 23. Adherent, stony, with

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slender subcylindrical branches; cells perforated, lamellar, as if ciliated on the margin, and laterally disposed in transverse or longitudinal series.

Madrepora fungitus. Pl. 75, f. 24. Adherent, subdendroidal, branching, the surface provided on all sides with dispersed, distinct, cylindrical, tubular, hardly stelliferous projecting cells; laminæ very narrow. West Indian seas.

Pocillopora. Adherent, branched, lobed, and stony; surface, on all sides, provided with hollow cells, with their interstices porous; cells dispersed and distinct; the margin rarely projecting; the stellæ hardly apparent.

Porites clavaria. Pl. 75, f. 25. Adherent, stony, branched, or lobed and obtuse, with a stelliferous surface; stellæ regular; sub-contiguous, superficial, or excavated; with perfect margins, or destitute of any; laminæ filamentous, sharp, or pointed. American and Indian ocean. Fig. 26. This species greatly magnified.

Astrea radiata. Pl. 75, f. 27. Adherent, incrusting marine substances, or forming a hemispherical or globular mass, rarely lobed; upper surface with numerous orbicular, or subangular, lamellar, and sessile stellæ. American seas.

Explanaria mesenterina. Pl. 75, f. 28. Adherent, stony, exhibiting a free, foliaceous membrane, undulated, and sublobed, with only one stelliferous face; stars dispersed, sessile. Indian ocean.

Echinopora. Adherent, stony, depressed, and extended into a free membrane; rounded, filiform, with fine striæ on both sides; upper surface with numerous small papillæ, and convex, rounded stars; papillæ perforated with one or two holes, each covering a lamellated star; stellæ scattered, orbicular, and covered.

Monticularia. Adherent, stony, incrusting marine substances, united into a subglobular, gibbous, or lobed mass, or having subfoliaceous expansions; upper surface rugose, with elevated pyramidal contiguous stars, and with a solid central, simple, or dilated axis, around which the radiating laminæ adhere.

Meandrina labyrinthica. Pl. 75, f. 29. Adherent, stony, forming a simple, convex, or hemispherical mass; surface convex, composed of compartments more or less hollow, sinuous, and provided on each side with parallel, transverse plates, which adhere to the raised crests. American ocean.

Agaricia ampliata. Pl. 75, f. 30. Adherent, stony, with depressed foliaceous expansions, and one surface provided with furrows, or stelliferous wrinkles; stellæ scaled, lamellar, frequently imperfect and indistinct. Indian ocean.

Pavonia agaricites. Pl. 75, f. 31. Adherent, stony, frondescent, with depressed subfoliaceous lobes, which are either straight or ascending, with the two surfaces provided with furrows or stelliferous wrinkles; stellæ lamellar, scaled, and more or less imperfect. American seas.

2. Stars terminal.

Fungia agariciformis. Pl. 75, f. 32. Free, stony, simple, orbicular, or oblong, convex and lamellar above; centre oblong and hollow; concave and uneven beneath; having one subproliferous, lamellar star on the upper surface, with the laminæ dentated, or spinous laterally. Indian seas.

Cyclolites. Free, stony, elliptical or orbicular, convex and lamellar above, with a hollow centre, depressed below, with circular, concentric lines; a single lamellated star occupying the upper surface; laminæ very fine and entire.

Turbinolia. Free, simple, turbinated, or wedge-shaped, and acute at the base; longitudinally striated externally, and terminated by a lamellated, stellular cell, which is oblong in some instances.

Caryophyllia cyathus. Pl. 75, f. 33. Mass free, stony, simple, or branched, which, with the stem, is subturbinated, longitudinally striated, and each with a lamellar stellate termination. Mediterranean. Fig. 67, *C.* Smithii. Fig. 68, animal fully expanded.

Sarcinula. Free, stony, consisting of a simple, polypiferous, and thick mass, composed of united, numerous, parallel, cylindrical, vertical masses, united in fasciculi by intermediate, transverse partitions; inside of tubes with radiated laminæ.

Stylina. Mass stony, simple, exteriorly rough; tubes numerous, cylindrical, fasciculated, united, containing laminæ radiating from a common axis, which is styliform, projecting beyond the tubes.

SECTION IV.

With a stony polypiferous, solid, and interiorly compact mass: cells perforated, or tubular, and destitute of laminæ.

Tubipora musica. Pl. 75, f. 34. Stony, composed of cylindrical tubes, which are straight, parallel, individually separate, but united by external and transverse partitions; tubes articulated, communicating by radiating, porous partitions. Indian seas. Fig. 66 is a magnified portion of the tubes.

Catenipora. Stony, composed of parallel tubes, inserted in the thickness of vertical plates, anastomosed like net-work.

Favosites. Stony, simple, variable in form, composed of parallel prismatic tubes disposed in fasciculi; tubes contiguous, pentagonal, or hexagonal, more or less regular, and seldom articulated.

Millepora calcarea. Pl. 75, f. 35. Stony, interiorly solid, polymorphous, branched, or frondescent, provided with simple pores, which are cylindrical, and usually very small, sometimes hardly perceptible, placed perpendicular to the axis, or to the expansions of the polypiferous mass. European seas.

Distichopora. Adherent, solid, stony, with slightly compressed branches; pores unequal, marginal, arranged on opposite sides in a longitudinal series, and in the form of sutures; branches with star-shaped warts on their sides.

Orbulites. Free, stony, orbicular, depressed, or slightly concave, both sides porous, or on the margin only; somewhat resembling a Nummulite; pores minute, disposed in regular order, approximate, sometimes hardly visible.

Lunulites. Free, stony, orbicular, depressed, convex on one side, with radiated striæ and pores between them, other side concave, wrinkled, or with divergent furrows.

Ovulites. Free, stony, egg-shaped, or cylindrical, hollow interiorly; frequently with regularly disposed perforations on both sides. Known only in a fossil state.

SECTION V.

Polypiferous masses of a substony consistence, with frondescent or crustaceous expansions; cells small, short, sometimes in a regular series, at other times irregular, and usually disposed at the surface of the expansions of marine substances.

Dactylopora. Free, stony, cylindrical, obtuse at one extremity, contracted and perforate at the other; exterior surface reticulated, the meshes rhomboidal, with very small pores.

Ocellaria. Stony, depressed as a membrane, variously twisted, somewhat funnel-shaped, with arenaceous superficies, provided with pores on both surfaces; these are disposed in quincunx order, with the centre inserted into a solid axis.

Alveolites. Stony, either forming incrustations, or a free mass disposed in numerous concentric layers, covering one another; layers composed each of a junction of tubular prismatic cells, short, contiguous, and parallel, exterior appearing like network.

Retepora cellulosa. Pl. 75, f. 36. Stony, interiorly porous, with thin, depressed expansions, composed of branches which are sometimes free, usually anastomosed like network; polypiferous cells on one side only, at the upper or internal surface of the mass.

Adeona. Nearly stony, caulescent, or fan-shaped; stem subarticulated, with obscurely granulated joints, and foliaceous expansions covered with very small cells on both sides; these are in a crowded and in quincunx order, with osculi rounded.

Eschara foliacea. Pl. 75, f. 37. Nearly stony, but not flexible; expansions lamelliform, thin, fragile, very porous interiorly, entire, or divided; polypiferous cells disposed in quincunx order on both sides.

Cellepora pumicosa. Pl. 75, f. 38. Nearly stony, interiorly porous, spreading in a raised, foliaceous crust; expansions depressed, lobed, or branching, subconvolute, not flexible, celluliferous on the external surface; cells urceolate, submembranous, gibbous, slightly projecting, contiguous, confused, with the aperture constructed. Fig. 39 is a magnified view of this mass of polypi. European seas.

Discopora. Subcrustaceous, depressed, extended in an undulated, discoid, stony plate, with the upper surface cellular; cells small, numerous, short, contiguous, regularly arranged in subquincunx rows, with the openings not constructed.

Tubulipora transversa. Pl. 75, f. 40. Consisting of a parasitical or incrusting mass, with submembranous cells disposed in clusters or series, and mostly free; cells elongated, tubular, aperture orbicular, regular, and rarely dentated. Fig. 41, one of the warts magnified. Fig. 42 represents one of the particles of which the crust is composed. Mediterranean.

Flustra foliacea. Pl. 75, f. 12. Flexible, submembranous, stony, and frondescent, or consisting of a thin crust, formed of contiguous cells, disposed in numerous, regular rows, either on one or both surfaces; cells sessile, short, oblique, with terminal, irregular orifices, frequently dentated or ciliated on the margin. Fig. 1 is a magnified view of the cells. European seas.

Flustra carbasea. Pl. 75, f. 61, is the polypiferous mass. Fig. 62 represents the tentacula in the polypes of this species, each having a single row of cilia, extending along both the lateral margins from their base to their termination. Fig. 63 is a portion of one of these tentacula highly magnified. Fig. 64 is a delineation of one of the gemmules, greatly magnified. Fig. 78 is a part of *F. verticillata* greatly magnified.

SECTION VI.

Polypiferous masses consisting of one substance only, slender, fistulous, membranous, or horny stems, flexible and branched, containing polypi in their interior.

Polyphysa. Polypiferous mass fungoid, with a calcareous crust, and a simple, filiform, fistulous stem, terminated by a cluster of inflated, vesicular, unequal cells, clustered at top.

Acetabulum. Fungoid, with a calcareous crust; stem filiform, simple, and fistulous, terminated by an orbicular depression, hollow in the centre; head with radiated striæ from above downwards, perforated in the margin, and composed of orbicularly united tubes.

Tibiana. Adherent, tubular, membranaceous, or horny, slightly incrusted exteriorly, perforated on the sides, with large, alternate openings, which slightly project.

Dichotomaria fruticulosa. Pl. 75, f. 43. Polypiferous mass with tubular, subarticulate, dichotomous stems, and a calcareous incrustation: cells of the polypi not apparent. American seas. Fig. 44 represents the *D. obtusata*, an inhabitant of the coasts of the Bahama Islands.

Anguinaria spatulata. Pl. 75, f. 45. Adherent, and extending itself in the form of a plant, climbing, slender, and fistulous; cells straight, filiform, tubular, distant, slightly claviform, or spatulous, with the openings placed laterally below the summit. Fig. 46 is a magnified portion.

Cellaria thuia. Pl. 75, f. 47. Adherent, with the stems tubular and branched, sub-articulated, horny, shining, and calcareous; cells in rows, either concatenated, or adnate, or incrusted at the surface. Fig. 48, a portion of a stem magnified. European seas.

Liriozoa Caribæa. Pl. 75, f. 49. Adherent, branched, calcareous; with tubular stems, jointed, creeping; cells oblong, pedicellate, arranged in clusters of three, with apposite clusters at the top of the joints. Fig. 50, a portion of a stem magnified. West Indian seas.

Serialaria lendigera. Pl. 75, f. 51. Adherent, branched, horny, stems slender, fistulous, provided with cylindrical projecting cells, parallel, cohering in series, in masses, or in a continuous spiral form. Fig. 52, a portion of a stem magnified. European seas.

Plumularia myriophillum. Pl. 75, f. 53. Adherent, branched, horny, stalks slender, fistulous, simple, or branched, provided with calyciferous ramuli; cells prominent, sessile, dentiform, subaxillary; vesicles subpedunculate. Fig. 54, a portion of a stem magnified. European seas.

Antennularia ramosa. Pl. 75, f. 55. Adherent, horny, with the stems fistulous, simple, or branched, articulated, and provided with verticillate, slender ramuli; cells distant. Fig. 56, a portion of a stem magnified. European seas. Fig. 9.

Sertularia frutescens. Pl. 75, f. 10. Adherent, horny, stems slender and fistulous, simple or branched, which, together with the stems, are provided with separate, lateral, dentiform cells; these are projecting, sessile, or subpediculated, scattered, or disposed in two apposite rows; vesicles larger than the cells. Fig. 3, a portion of a stem magnified. European seas.

Campanularia verticillata. Pl. 75, f. 57. Adherent, stems fistulous, filiform, horny, simple, or branched; cells campanulate, dentated on the margin, supported by long, spiral footstalks. Fig. 58, a magnified portion of a branch.

Cernularia. Adherent, horny, with simple funnel-shaped stems, each containing a polypus; polypus solitary, terminal, mouth provided with eight tentacular pinnæ set in a row.

Tubularia ramosa. Pl. 75, f. 59. Adherent, slender, tubular, simple, or branched, horny; points of the stems and branches, each terminated by a polypus; mouth of the polypi provided with two rows of naked tentacula, which are not retractile, and with a varix at their origin. Fig. 60, a magnified portion of a branch. British seas. Fig. 74, *T. magnifica.* Tropical seas.

Plumatella. Adherent, slender, tubular, branching, submembranous, extremities of stems and branches terminated each by a polypus; mouths retractile, provided with ciliated tentacula, arranged in a single row, and destitute of a varix at their origin.

SECTION VII.

Polypiferous masses either free, isolated, and floating in the water, or adherent, and agglomerated in cellular masses, composed of one substance on aquatic bodies; polypi provided with numerous tentacula, which do not complete the circle round the mouth. The animals of this section chiefly inhabit fresh water.

Alcyonella. Incrusting, thick, convex, and irregular, consisting of an aggregation of vertical subpentangular tubes, open at their summit; polypi elongated, cylindrical, with fifteen or twenty straight tentacula, disposed around the mouth on one side, at the upper extremity.

Spongilla. Adherent polymorphous, cellular, irregular, composed of subpiliferous laminæ, forming unequal, diffuse, irregularly disposed cells, with gelatinous and free granules within them.

Cristatella. Free, globular, gelatinous, covered by short, thick, polypiferous tubercles, each of which encloses a polypus, the extremity separated into two retractile branches, arcuated and provided with pectinated tentacula; mouth situate at the union of the tentacular branches.

Difflugia. Body small, gelatinous, contractile, enclosed in a testaceous tube, projecting; from one to ten tentacular arms; sheath oval, or subspiral, truncated, or open at the base; surface with agglutinated grains of sand.

ORDER IV.—POLYPI DENUDATI.

Polypi provided with tentacula, and not forming a polypiferous mass; greatly diversified in form, in the number and situation of their tentacula, and fixed either constantly or spontaneously.

Pedicellaria. Adherent, formed of a stiff peduncle, terminated at the summit by a claviform inflation, furnished with scales, or radiated beards; mouth terminal.

Coryne. Fleshy, seated on a peduncle; summit of a vesicular club-form, provided with scattered tentacula; mouth terminal.

Hydra viridis. Pl. 75, f. 69. Oblong, linear, in the form of a reversed cone, narrowed below, gelatinous, transparent, and fixed spontaneously by the base; mouth terminal, provided with a row of cirous tentacula. *a.* exhibits the body extended, and *b*, the body in a contracted state. Fig. 79, body expanded. Inhabits fresh waters.

ORDER V.—POLYPI CILIATI.

Mouth provided with ciliated and gyratory organs, which agitate the water, but do not seize the food.

SECTION I.—ROTIFERI.

With one or many organs in a circular form, ciliated, and rotatory at the opening of the mouth.

Tubicolaria. Body contractile, oblong, contained in a tube fixed on aquatic bodies; mouth terminal, funnel-shaped, provided with a retractile, ciliated, and rotatory organ.

Vorticella polypina. Pl. 75, f. 75. Body naked, pedunculated, fixed spontaneously, or constantly by its base; superior extremity inflated, and terminated by a large mouth provided with rotatory ciliæ. Inhabits stagnant waters.

Urceolaria. Body free, contractile, urceolate, sometimes elongated, without tail or peduncle; mouth terminal, dilated, provided with rotatory ciliæ.

Furcularia. Body free, contractile, oblong, provided with a short or elongated tail, terminated by two points or two setæ; mouth furnished with one or two ciliated and rotatory organs.

Brachionus. Body free, contractile, nearly oval, covered, at least partly, by a transparent sheath, stiff, capsular, and provided anteriorly with one or two ciliated rotatory organs.

Folliculina. Body contractile, oblong, inclosed in a transparent sheath; mouth large, terminal, with ciliated and rotatory organs.

SECTION II.—VIBRATILES.

Ciliæ placed near the mouth, moving in interrupted vibrations.

Vaginicola. Body minute, oval, or oblong, anteriorly ciliated, and provided with a tail; enclosed in a transverse sheath, but not attached.

Trichocerca. Body minute, oval, or oblong, anteriorly truncated; mouth retractile, sub-ciliated, tail forked, sometimes articulated.

Rattulus. Body minute, oblong, truncated, or anteriorly obtuse; mouth distinct, tail very simple.

POLYPUS, in medicine; a name given to swellings, which form chiefly in the mucous membranes, and were considered to resemble the animal of the same name. These tumours are most common in the nostrils, the throat, the uterus, and are more rarely found in the stomach, the intestines, the bladder, or the external passage of the ear. Polypuses differ much in size, number, mode of adhesion, and nature. One species is called *mucous*, *soft*, or *vesicular* polypuses, because their substance is soft, spongy, vesicular, and, as it were, filled with white juices; another is called the *hard* polypus, and has been distinguished into the fibrous or fleshy, and the scirrhous or cancerous. The fibrous polypuses are of a dense, close texture, and of a whitish colour; they contain few vessels, and do not degenerate into cancers. The scirrhous or carcinomatous polypuses are really cancerous, painful tumours, which discharge blood, and exhibit all the pathological changes of cancerous affections. Different modes of treatment must be adopted, according to the particular nature of the disease. Among the methods of cure are *exsiccation*, which consists in subjecting the polypus to the action of astringent powders or solutions, to effect the resolution of the tumour; *cauterization*, or the application of fire and caustics; *excision*, or the removal of the polypus by the knife; *extraction*, or its removal by the fingers, or by pincers; the *seton*, which consists in the application of a wire or thread, for the purpose of destroying the pedicle, or by *ligature*, which consists in tying up the base of the tumour, and causing it to fall off by the destruction of the vascular pedicle which nourishes it.

POLYTECHNICS; used on the European continent, particularly in Germany, for the science of all mechanical arts and skill, aided or unaided by machinery.

POLYTECHNIC SCHOOL in France, (*Ecole polytechnique*); an establishment which ranks among the first in the history of education. This school was established by a decree of the national convention of March 11, 1794, which was passed by the influence of Monge, Carnot, Fourcroy, &c. The committee of public safety had seen the necessity of providing for the education of engineers. The school was first called *ecole centrale des travaux publics*, which name was changed a year after. Men like Lagrange, Laplace, Berthollet, Fourcroy, and many other distinguished individuals, were its professors. It is now established in the buildings of the ancient college of Navarre. Napoleon did much for it, and under him it received considerable modifications. The pupils were obliged to live in the building, and wear a uniform. Its object is to diffuse the knowledge of the mathematical, physical and chemical sciences, and to prepare the pupils for the artillery service and the various departments of engineering, military, naval, and civil. The number of pupils is limited to 300. The terms for the students not supported on the foundation are 1000 francs a year, independent of the expense of uniform and books. The pupil, at the time of admission, must be more than sixteen and less than twenty years old. The course of studies lasts two years, in certain cases three. A rigorous examination precedes admission, and another examination takes place before the pupils leave the institution, and it is invariably attended by the greater number of the marshals of France, together with many of the most distinguished scholars; "and," says an English writer, "the replies of the pupils might well astonish a senior wrangler of Cambridge, or a medallist of Dublin." The origin of this establishment, and the high character of the course of instruction, has always inspired the students with a warm love of their country. March 30, 1814, they fought bravely against the allies. In April, 1816, the school was abolished, the students appearing not sufficiently devoted to the Bourbons, who, however, were obliged to re-establish it, in September of the same year. In the revolution of July, 1830, the students immediately took part with the people, and were of the greatest use, as well by their military knowledge as by their heroic enthusiasm; and several of the most important attacks during those memorable days were conducted by these youths. The *ecole polytechnique* is a favourite institution with the whole nation. See *France*. See the work of M. Fourcy on this school, and *La Correspondance de l'Ecole Polytechnique*, by M. Hachette.

POLYTHEISM; worship of several or many gods, opposed to *monotheism* (q. v.), (from *πολυς*, many, and *θεος*, god). The origin of polytheism may be different. We find tribes whose polytheism can be ascribed, almost beyond doubt, to the deification of the powers and phenomena of nature; but with others it cannot be so clearly traced. As to the views of the polytheism of antiquity, they may, perhaps, be classified under the following heads:

1. Monotheism was the pure religion revealed to the progenitors of the human race, handed down through the patriarchs, and, after its decline, revived in its purity by Moses, and taught to the children of Israel, whilst all nations except this chosen one deviated more and more from the true revelation, and created a host of gods, good and evil. See *Monotheism*.

2. Man, beginning with the savage state, proceeded in every thing from the concrete to the abstract; from the observation of nature, he rose to the natural sciences; from the measurement of space to mathematics; from the idea of just dealing, so natural in families, to that of politics and ethics; from the observation of beautiful things to ideal beauty; and from the knowledge of effects, only ascribable to higher powers, to the veneration of the powers of nature, to polytheism, and from this to monotheism. The chief objections to this view are that there are numerous nations which refined their polytheism more and more, but never arrived at monotheism, the two most civilized nations of antiquity not excepted, and that we meet with monotheism in the very records where, according to this view, we should expect it least,—those of the most ancient races, as given in the Bible.

3. Another view is taken of polytheism by Creuzer, in his Symbolics and Mythology of the Ancient Nations, particularly of the Greeks (partly translated, partly rewrought by Guigniaut, in his *Religions de l'Antiquite, considerées principalement dans leurs Formes symboliques et mythologiques*, Paris, 1824 et seq.). He considers Greek polytheism as presupposing a whole system of ancient Asiatic poetry, philosophy and theology, the symbols of which gradually lost their hidden meaning, but still continued long in use as forms.

4. Others have considered the polytheism of the Greeks as the mere forms under which natural science had been preserved and taught in previous ages.

5. Some consider polytheism as having originated from a corruption of monotheism; others regard it as a deification of the powers of nature. Even the Greek polytheism is considered by many as indicating strongly the pre-existence of monotheism. See *Mythology*.

The two extremes of polytheism may be considered to be *dualism* (q. v.), and *pantheism* (q. v.). The former is the belief in two original beings, a good and an evil spirit. It forms the basis of several Oriental religions, and is considered by many as merely a misconception of the primitive monotheism. Pantheism originates from polytheism. It makes the world itself God, and God the world, the One and the Whole.

POLYXENA; daughter of Priam and of Hecuba, whose fate is related by the post-Homeric epic poets. Achilles loved her, and advantage was taken of his passion for her to effect his death. According to some accounts, she returned his affection, and killed herself on his tomb. But according to the most common story, she was sacrificed to his Manes, either in Thrace or at his tomb.

POMBAL, SEBASTIAN JOSEPH CARVALHO, count of Oeyras, more known as marquis of Pombal, a celebrated Portuguese statesman, was born in 1699, at the castle of Soura, near Coimbra, and died in 1782. His father was a captain of the poorer class of the nobility; but his mother, a Mendoza, and his uncle, a respectable ecclesiastic, opened to the young Carvalho, who, after having studied law at Coimbra, entered the army, the prospect of promotion. Nature had given him all the qualities which indicate a person destined for rule; a tall and strong frame, a vigorous constitution, a daring eye, a fiery temperament, strong passions, a penetrating judgment, and the most captivating address. In every thing which he undertook, he led the way. Having been banished from Lisbon on account of some youthful imprudences, the offspring of his ardent temperament, he passed several years at Soura devoted to study. While there, he gained the affections of Theresa de Noronha Almada, a rich widow, whose proud relations rejected with disdain his advances. He eloped, however, with the object of his passion, and his courage and resolution saved him from the daggers of assassins. At the same time, the contempt with which the family of his wife, the counts of Arcos, treated him, kindled his ambition to rise. He returned to court, where his address acquired him such high favour, that in 1739 he was appointed ambassador to London. Here he became acquainted with the relations between England and Portugal, and formed the plan of delivering his country from the fetters of the English commercial system. The new minister, Peter di Motta, his enemy, recalled him in 1745; but the queen, who was his patroness, sent him to Vienna to act as mediator between the pope and the empress Maria Theresa. Carvalho here gained general esteem, and, his first wife being dead, obtained the hand of the youthful countess of Daun. He was obliged, however, to refute the calumnies which a Portuguese of rank had circulated against him in Vienna, and to prove his claims to nobility. The queen now procured his nomination as ambassador to the Spanish court; but the king and his minister hated him; he was recalled, and even the influence of the queen was insufficient to overcome the aversion of the king (John V.) It was in vain that Pombal insinuated himself into the favour of the Jesuits, and, by his entire devotion to the order, imposed upon them to such a degree as to obtain an intimate acquaintance with their organization, of which he afterwards made use when he was minister. The high nobility persecuted him with irreconcilable hatred; but Carvalho concealed his desire of revenge, and passed for the most amiable, modest, and pious courtier in the service of the queen. John V. died in 1750, and, through the influence of the queen dowager, Carvalho finally obtained from his successor, Joseph I., the long coveted post of secretary of state for foreign affairs. The confessor of the king, Moreira, a Jesuit, was his friend; and Carvalho courted the order with such zeal, that he was called the *great Jesuit*. He soon rendered the feeble and sensual king (particularly after the death of the queen mother, 1754) entirely subject to his influence. Joseph I., from fear of his brother dom Pedro, to whom Carvalho's enemies attached themselves, fell in with the most daring projects of his minister; and the latter now proceeded to the accomplishment of his four favourite objects;—the expulsion of the Jesuits; the humiliation of the high nobility; the restoration of the prosperity of Portugal, and the absolute command of the state, in the name of the monarch. The kingdom was reduced to the lowest condition. England, the Jesuits, and the high nobility, monopolized the wealth of the country, which was without an army or a fleet, without commerce or agriculture. The minister acted on the principles of the mercantile system, and although obliged to abandon many of his designs, succeeded in some of them. It required a man of his character to withstand the attacks to which he was exposed, from the inquisition, to which he prohibited its *autos da fe*; from the Jesuits, whom he expelled from their missions in Paraguay; from the high nobility, whom he deprived of their princely possessions in the colonies; and from the prelacy, whose powers he abridged. Then came the earthquake of November 1, 1755, which buried 30,000 human beings, and destroyed property to the value of 400,000,000 dollars. Carvalho left the care of his own family and property, and appeared in the midst of the general despair, as a saviour, displaying a vigour and resolution, which, alone, ought to have conciliated his enemies. He was to be seen for a whole week after this calamity, uninterruptedly employed in every place where aid was needed, in contriving means of relief, and restoring order; and, under the most disastrous circumstances and greatest difficulties, displayed the most active benevolence and most extraordinary energy. The king looked upon him as a favourite of Heaven, and submitted implicitly to his direction. Carvalho was now created count of Oeyras, and, in 1756, first minister. He then removed every one who ventured to obstruct his plans. It was necessary to proceed with the most unyielding rigour, since the profligate nobility perpetrated assassinations without hesitation, and plundered the people without mercy. But, with the pride of the great, whom he humbled, and the avarice, which his commercial regulations exasperated, was now connected the discontent of the country people, excited by his establishment of monopolies, which, however, was done only to counteract the actual monopoly of the English. The discontented vine-dressers committed excesses in Oporto; but Pombal suppressed the riots by the most comprehensive laws against treason, which made the will of the king valid against all constitutions and privileges. He also exposed, to the astonishment of Europe, the conduct of the Jesuits (who endeavoured to persuade the public that he was Antichrist), in their government in Paraguay. In his *exposé* of this matter, there are, certainly, many exaggerations; and there is no doubt that the fathers ruled these provinces much better than the government of Spain or Portugal would have done. Carvalho finally determined to remove the Jesuits entirely from the person of the king. They were deprived of the place of confessors, and were ordered (September 16, 1757) to retire to their colleges. Several Portuguese grandees, who had joined in intrigues against the minister, were banished from Lisbon. Pombal now pushed his measures with vigour; as his attempts to encourage agriculture had been unsuccessful, he proceeded to extirpate the vine, and was, finally, completely victorious. A conspiracy against the life of the king, who was wounded on the night of September 3d, 1758, by assassins, whose blows he escaped only through the fidelity of his attendant, or the fright of his mules, delivered the minister's mortal enemies into his hands. Three months after the attempt, Pombal, on the night of the celebration of his daughter's marriage, at which the principal nobility were present, arrested the marquis of Tavora and his family, the Jesuit Malagrida, and, the next day, the duke of Aveiro and others. The minister and a member of the supreme judicial tribunal conducted the examination, and, after a hasty trial, a dreadful sentence was passed, and executed before the castle of Belem (January 13th, 1759). The duke of Aveiro and the marquis of Tavora were broken on the wheel, as the principals of the conspiracy; the sons and the son-in-law, with the servants of the former, were strangled, as accomplices; the wife of the marquis was beheaded and a servant of the duke burnt, as were also the dead bodies of the others. The Jesuits were suspected of being the authors of the plot; but the marquis of Tavora, who had thrown out some accusations against them, had retracted them in writing. Still the minister denounced them to the pope, as the contrivers of the scheme, and not being able to procure immediately a bull, permitting the secular tribunals to proceed against them, he caused some of them to be executed in prison. Malagrida, who had prophesied the death of the king, was condemned to the flames by the inquisition, and burnt in 1761. Pombal had already banished the whole order from the kingdom, as rebels and enemies of the king, by a royal decree, of September 3d, 1759, and, as they did not comply with the mandate, caused them to be seized by soldiers, and transported, to the number of 1854, to the States of the Church. These proceedings gave rise to a protracted dispute with the pope; in 1760, Pombal transported the papal nuncio beyond the frontiers, and was on the point of dissolving all connexion with Rome, when Clement XIII. died, and Clement XIV., his successor, abolished the order in 1773. Portugal was soon after involved in a short war with Spain, and, at a subsequent period, in a second war, on account of the minister's haughty conduct towards that government. The Portuguese army received an entirely new organization, and the fortifications on the frontiers were put in a better condition. Pombal was no less active in his efforts to improve the country in every relation, and paid particular attention to the schools; he also rendered the censorship less strict, and by a law of 1773, established the toleration of converts to Christianity, who had before been treated as secret Jews, and denied many civil privileges. Projects of ambition and of vengeance on his enemies, who repeatedly attempted his life, and his plan of placing on the throne the prince of Beira, the grandson of the queen, occupied the rest of his public life. Joseph I., whose daughter was the bitter enemy of Pombal, died February 24, 1777, and the minister was dismissed. The state prisoners, whom he had incarcerated, 9800 in number, were released, and all his regulations were abolished, so that Portugal sunk back into its former state of imbecility. Pombal transferred to the young queen a treasure of 78,000,000 crusados, and a well organized state. But the hate of his enemies was more powerful than his services. The Portuguese nobility left no means untried to bring him to the scaffold. The queen caused an examination to be made into the trial of the assassins of the king, and Pombal saved himself only by exhibiting the original proofs of the conspiracy, which had not been made public. The hated and persecuted Pombal retained his titles and his estates, and, retiring into the village of Pombal, occupied himself in reading and in works of charity. He died there, May 8, 1782, in the eighty-fourth year of his age. His history has been misrepresented by his Italian biographer, an ex-Jesuit, and in the *Anecdotes du Ministère de Pombal* (Warsaw, 1784). See *L'Administration du Marquis de Pombal* (Amsterdam, 1788, 4 vols.)

POMEGRANATE (*punicum granatum*). In its wild state, this is a dense spiny shrub, eight or ten feet high, but, when cultivated with care, and in a favourable climate, it attains double these dimensions. It is supposed to have originated in the north of Africa, and thence to have been introduced into Italy. By the Romans it was called *malum Punicum*, or Carthaginian apple, and the country adjacent to Carthage was then celebrated for its production. The leaves are opposite, lanceolate, entire and smooth; the flowers are of a brilliant red, large, and almost sessile; the fruit, when cultivated, attains the size of a large apple, and has a thick coriaceous rind, crowned at the summit with the teeth of the persistent calyx. It is filled with a multitude of small red seeds, and the pulp is more or less acid, and slightly astringent. The pomegranate is now naturalized as well as extensively cultivated throughout a great part of the south of Europe, for the sake of the fruit; and, even in those climates where this does not attain perfection, the beauty of the flowers renders it a favourite ornamental shrub. Numerous remarkable varieties have been produced, differing in the beauty of their flowers, and in the taste and quality of the fruit. The pomegranate, in warm climates, sometimes attains an enormous size. A cooling and agreeable beverage is made of the juice mixed with water and sugar or honey. Another species (*P. nana*) inhabits the West Indies and Guiana, where it is sometimes used as a hedge plant. The flowers and fruit are very small. These two plants, by themselves, constitute a distinct natural family.

POMERANIA (in German *Pommern*); a duchy belonging to Prussia, having Mecklenburg on the west, Brandenburg on the south, West Prussia on the east, and the Baltic on the north. It is divided by the Oder into Anterior or Hither Pomerania (*Vorpommern*), and Hinder or Farther Pomerania (*Hinterpommern*). It contained, in 1828, a population of 877,555, principally Protestants, on 12,000 square miles. It is a low and almost level country. The Oder is the principal river. The soil is in general sandy and indifferent. The mineral productions are unimportant, and the manufactures inconsiderable. The commerce, of which Stettin is the centre, is of more consequence. The principal productions are corn, flax, hemp, tobacco and wood: besides these articles, cattle, butter, wool, &c., are exported. Pomerania is divided into three governments, Stettin, Koslin and Stralsund. The duchy was claimed by the house of Brandenburg in 1657, on the extinction of its ducal house, but it was occupied by Sweden during the thirty years' war, and Farther Pomerania was retained by that power at the peace of Westphalia. Prussia acquired a large part of Farther Pomerania by the peace of Stockholm (1720), and, in 1815, obtained the remainder from Denmark (to whom it had been ceded by Sweden) in exchange for Lauenburg, and a sum of money. Since 1823, Pomerania has provincial estates, and the present king of Prussia has abolished slavery. The Pomeranians are partly Germans and partly Cassubians, or descendants of the old Vandals, with a peculiar dialect. See *Prussia*.

POMFRET, JOHN, an English poet, was born in Bedfordshire in 1667, studied at Queen's College, Cambridge, and took orders. He died in 1702. His Choice has been highly popular. His poems were published in 1699, and some additional pieces appeared after his death.

POMOLOGY; a word much in use in France and Germany for that branch of gardening which embraces the cultivation of fruit trees, shrubs, &c., (*pomaceæ*, *drupaceæ*, *bacciferæ*), and, of course, the cultivation of the fruits themselves. There exist many pomological societies, much the same as the British and American horticultural societies, though the former, as the name implies, direct their attention chiefly to the cultivation of fruits.

POMPADOUR, JEANNE ANTOINETTE POISSON, marchioness de; the mistress of Louis XV., in whose affections she succeeded Madame de Chateauroux. She was born in 1720, and was the daughter of a kept mistress by a farmer of Ferte-sous Jouare, who had made a tolerable fortune in the corn trade, and was accused of some frauds. In 1741, she was married to a *sous fermier* d'Etioles. She was well educated, sensible, amiable, rich in graces and accomplishments, and gifted by nature with a good heart and a good understanding. "I know her well," said Voltaire: "I was the confidant of her love. She declared to me that she had always had a secret presentiment that she should be loved by the king, and that, without well knowing why, she had felt a violent inclination in his favour." This notion, which, in her circumstances, was somewhat wild, seems to have been raised by her often seeing the king at the chase in the forest of Senart. Tournehem, her mother's lover, had a country seat in the vicinity. Mad. d'Etioles made her appearance in a sort of a calash, and attracted the notice of the king, who frequently sent her game. She was finally presented to the king, whose favour she soon entirely engrossed. In 1745, she appeared at court under the title of marchioness of Pompadour. Here she enjoyed the highest consideration, but did not at first interfere in political affairs, satisfied with appearing as the patroness of learning and the arts. She collected books, pictures, and curiosities, and encouraged the institution of the military school, of which Paris du Verney was the founder. But, when her charms began to fade, and she could only maintain her influence with the king by furnishing him other objects for the gratification of his passions, she turned her attention to state affairs. She filled the most important offices with her favourites, and contributed to produce those evils which afterwards pressed so heavily on France. It is said to have been principally owing to her that France became involved in the war against Frederic II. The empress Maria Theresa had propitiated her favour by writing to her with her own hand. The burdens and sufferings which this war brought upon France must be laid at her door, since she removed Bernis, who was in favour of peace, and supplied his place by Choiseul, effected the recall of marshal d'Estrees at the moment of triumph, and promoted incapable generals to the command. She died in 1764, at the age of forty-four years, little regretted by the king (see *Louis XV.*), and hated and reviled by the nation. The memoirs and letters which appeared under her name are not genuine, but are attributed to the younger Crebillon. See the ***Mémoires*** of Mad. Campan, and those of Du Hausset.

POMPEII; an ancient city of Campania, formerly celebrated for its commerce, which was partly destroyed by an earthquake, A. D. 63, and together with Herculaneum, was buried by a stream of lava, or rather by a shower of ashes, A. D. 79, and first discovered in 1748. It lies about twelve miles south-east from Naples. Pompeii is said to have been founded by the Opici, and, at a later period, was in the possession of the Samnites, who, having revolted, were replaced by Roman colonists. Although a less considerable city than Herculaneum, it contained many fine works of art, a large theatre, and many handsome buildings. (For an account of the excavations, see *Herculaneum.*) The excavations are still continued. The bed of ashes was about eighteen feet in depth. Although two-thirds are still covered, it is estimated that the town was three quarters of a mile in length by nearly half a mile in breadth. The walls are from eighteen to twenty feet high, and twelve thick, and contained several main gates, of which six have been uncovered. Twenty streets, fifteen feet wide, paved with lava, and having foot-ways of three feet broad, have also been excavated. The houses are joined together, and are generally only two stories, with terraces for roofs. The fronts are often shops, with inscriptions, frescoes and ornaments of every kind. The principal rooms are in the rear: in the centre is a court, which often contains a marble fountain. In some of the houses the rooms have been found very richly ornamented. A forum, surrounded with handsome buildings, two theatres, an arena, temples, baths, fountains, statues, urns, utensils of all sorts, &c., have been discovered. Most of the objects of curiosity have been deposited in the museums of Naples and Portici: among them are a great number of manuscripts. It is probable that most of the inhabitants escaped, as few skeletons have been found.—For further information see Gell and Gandy's *Pompeiana* (London, 1817—19), and the new series, conducted by the former, *Pompeiana* (part x., London, 1831); Wilkins's *Views of Pompeii;* Cooke's *Delineations* (London, 1827, 2 vols., folio, 90 plates); the account of Pompeii in the Library of Entertaining Knowledge; Bibent's Plan of Pompeii (Paris, 1826), showing the progress of the excavations from 1763 to 1825; and Goro's *Wanderungen durch Pompeji* (Vienna, 1825).

POMPEY (CNEIUS POMPEIUS), surnamed the Great (*Magnus*), born B. C. 107, was the son of Cneius Pompeius Strabo, an able general, but hated for his severity and avarice. The young Pompey had received from nature a pleasing person, and a graceful dignity, and early displayed talents which promised him equal success in the field and the forum. He first served under his father, who commanded an army against Cinna, in the neighbourhood of Rome during the Marian war. Here he narrowly escaped being assassinated by his comrade Terentius, who had been hired by Cinna to murder father and son. Having received information of the plot, he abandoned his tent in the evening, and secured his father's life, by stationing a guard round the prætorium. Soon after a mutiny broke out in the army, and the soldiers had formed the resolution to desert their obnoxious commander; but Pompey, then a youth of nineteen years of age, presented himself among the rioters, and, after trying remonstrances and prayers without effect, threw himself before the gate of the camp, and declared that they should go out only over his body. This firmness had the desired effect. By his gracious words and manner, he reconciled the soldiers to his father, who soon after perished by lightning. The party of Marius and Cinna gained the ascendency, and deluged Rome with blood. Pompey, who had retired to the neighbourhood of Picenum, where his estates lay, raised a body of troops on his own account, on the approach of Sylla, and compelled the neighbouring cities to declare themselves for the general. His popularity enabled him to raise three legions, with which he joined Sylla in Campania. Three leaders of the opposite party had attempted to obstruct his march, but he defeated them successively, and was received by Sylla with the highest marks of esteem, and saluted by him as *imperator*, although he had not yet attained the senatorial age, being but twenty-three years old. A series of sanguinary engagements ensued, by which the Marian faction was annihilated in Italy, and Sylla became the absolute master of Rome. To bind Pompey more closely to his interests, Sylla persuaded him to divorce his wife Antistia, and to marry his own step-daughter Æmilia. It was fortunate for Pompey's fame that he was employed, while Sylla was perpetrating his atrocities in the capital, in Sicily against the Marian general Perpenna. He drove Perpenna from the island, and won the affection of the Sicilians by his clemency. The Marian party had, meanwhile, collected in force in Africa, under Domitius Ahenobarbus, and received aid from the king of Numidia. Sylla obtained a decree of the senate, intrusting the command in that province to Pompey. Making a sudden attack on Domitius, at the head of five legions, he dispersed the greater part of his forces, stormed his camp, killed Domitius, took the Numidian king captive, and gave his dominions to one of his own partisans. This rapid and decisive success which occupied only fourteen days, excited the jealousy of Sylla, who commanded him to dismiss his forces and return to Rome. But the soldiers, who saw their hopes of plunder disappointed, broke out into a mutiny, and were reduced to obedience only by Pompey's threat to kill himself, if they persisted in their designs.

On his return, Pompey was received by Sylla with every mark of favour. According to Plutarch, it was from Sylla, but, according to Livy, from his flatterers, that Pompey received the surname of *Magnus*, which he thenceforward continued to bear. The jealousy of the dictator was, however, revived, when the former demanded a triumph. Sylla declared to him that he should oppose this claim with all his power; but Pompey did not hesitate to reply, that the people were more ready to worship the rising than the setting sun, and Sylla yielded.

Pompey therefore obtained the honour of a triumph, although he was the first Roman who had been admitted to it without possessing a higher dignity than that of knighthood, and was not yet of the legal age to be received into the senate. Sylla soon after abdicated the dictatorship, and, at the consular election, had the mortification to feel his rival's ascendency. He revenged himself by passing him over in his will; but Pompey was magnanimous enough to respect the dead, and used his influence to have his body buried at the public expense, with the greatest pomp.

New troubles soon broke out, occasioned principally by the ambitious projects of the consul Lepidus, who aimed at supreme power. Lepidus left Rome, and placed himself at the head of an army, but was defeated by the united forces of the consul Catulus and Pompey. The latter was then commanded to march against M. Junius Brutus (father of the celebrated M. Brutus), who commanded a body of troops in Cisalpine Gaul in the interest of Lepidus. Pompey compelled him to surrender, and put him to death, notwithstanding that he had promised him a safe conduct. A period of quiet now followed, and Catulus endeavoured to oblige Pompey to dismiss his troops. This the latter evaded, under various pretences, until the progress of Sertorius, formerly a general in the service of Marius, in Spain, induced the senate to send Pompey, now thirty years of age, to the support of Metellus, who was unequal to cope with so able an adversary. He was invested with proconsular power. The two commanders who acted independently of each other, though with a mutual good understanding, were both defeated through the superior activity and skill of Sertorius. Pompey lost two battles, and was personally in danger; and, as long as Sertorius was alive, the war was continued with little success. But Sertorius having been murdered by his own officers, and succeeded in the command by Perpenna, Pompey soon brought the struggle to an end.

On his return to Italy, the servile war was raging: Crassus had already gained a decisive victory over Spartacus, the leader of the rebels, and nothing was left for Pompey but to complete the destruction of the remnants of the servile forces; yet he assumed the merit of this triumph, and displayed so little moderation in his success, that he was suspected of wishing to tread in the steps of Sylla. He triumphed a second time, and was chosen consul B. C. 70, although he had yet held none of those civil offices through which it was customary to pass to the consulship. His colleague was Crassus, and both of them courted the people—Crassus by his profuse largesses, and Pompey by the restoration of the tribuneship, and other popular institutions. In the course of the year, when the censors were, according to custom, engaged in granting release from service to such knights as had served the time required, Pompey appeared before them, in his consular robes, and leading his horse by his bridle. The censor asked him—"Pompey the Great, have you served the time required by law?" "Yes," answered he, "and all under my own command." This answer was received with a general shout of applause: the censors rose from their seats, and accompanied him, amidst the acclamations of the multitude, to his house.

Two years after the expiration of his consulship, the pirates, encouraged by the Mithridatic war, had become so powerful in the Mediterranean that they carried on a regular warfare along a great extent of coast, and were masters of 1000 galleys and 400 towns. The tribune Gabinius, a man devoted to the interests of Pompey, proposed that an individual (whose name he did not mention) should be invested with extraordinary powers by sea and land for three years, to put an end to the outrages of the pirates. Several friends of the constitution spoke with warmth against this proposition; but it was carried by a large majority, and the power was conferred on Pompey, with the title of proconsul. In four months he cleared the sea of the ships of the pirates, got possession of their fortresses and towns, set free a great number of prisoners, and took captive 20,000 pirates, to whom, no less prudently than humanely, he assigned the insular towns of Cilicia and other provinces, which had been abandoned by their inhabitants, and thus deprived them of any opportunity of returning to their former course.

Meanwhile, the war against Mithridates had been carried on with various fortune, and, although Lucullus had pushed the enemy hard, yet the latter still found new means to continue the contest. The tribune Manilius then proposed that Pompey should be placed over Lucullus in the conduct of the war against Mithridates and Tigranes, and likewise over all the other Roman generals in the Asiatic provinces, and that all the armies in that quarter should be under his control, at the same time that he retained the supreme command by sea. This was a greater accumulation of power than had ever been intrusted to any Roman citizen, and several distinguished men were resolved to oppose a proposition so dangerous to freedom with their whole influence: but Pompey was so high in the popular favour that, on the day appointed for the consideration of the proposition, only Hortensius and Catulus had the courage to speak against it, while Cicero, who hoped to obtain the consulship through the support of the Pompeian party, advocated it with all his eloquence, and Cæsar, to whom such deviations from the constitution were acceptable, used all his influence in favour of it. Cicero's oration *pro lege Manilia* contains a sketch of Pompey's public life, with the most splendid eulogy that, perhaps, was ever made on any individual. The law was adopted by all the tribes, and Pompey, with assumed reluctance, yielded to the wishes of his fellow citizens. He arrived in Asia B. C. 67, received the command from Lucullus, who was the less able to conceal his chagrin as Pompey industriously abolished all his regulations. (See *Mithridates.*) The king was driven from his strongholds, defeated with the loss of his camp, and compelled to flee into the country beyond the Caspian. Pompey, who had, at the same time, detached Tigranes from his alliance with Mithridates, and placed his kingdom at the disposition of the Romans, followed Mithridates to Scythia, and waged war for two years with the warlike inhabitants of that region. He then returned to Pontus, completed the conquest of that kingdom, and converted Syria into a Roman province. At the invitation of the two brothers Aristobulus and Hyrcanus, who claimed the throne of Judæa, he appeared in that country to settle the dispute. After a three months' siege, he took Jerusalem by storm, and conferred on Hyrcanus the dignity of high-priest. In the mean time, Mithridates, reduced to despair, had poisoned himself, and thus ended the war.

After Pompey had settled the affairs of Asia, he visited Greece, where he heard the orators and poets, and displayed his respect for philosophy by making a valuable gift to the city of Athens. He then returned to Italy, dismissed his army, to quiet the apprehensions of the citizens, as soon as he landed at Brundusium (B. C. 61), and entered Rome as a private man. The whole city came out to meet him, and received him with acclamation. His claim of a triumph was admitted without opposition; and never had Rome yet witnessed such a splendid display as on the two days of his triumphal procession. Captive kings and nobles walked before his chariot, and the spoils which were poured into the public treasury amounted to an enormous sum. After the triumph, Pompey allowed all the captives to return to their country, except Tigranes and Aristobulus.

His plan now was, under the appearance of a private individual, to maintain the first place in the state; but he found obstacles on several sides. Lucullus and Crassus were superior to him in wealth; the zealous republicans looked upon him with suspicion; Cæsar was laying the foundations of his future greatness. Pompey was therefore driven to artifices of all sorts, and attached the profligate Clodius to his interest. Cæsar, on his return from Spain, aspired to the consulship. To effect his purpose, he reconciled Pompey and Crassus with each other, and united with them in forming the coalition which is known under the name of the *first triumvirate*. He was chosen consul (B. C. 59), and, by the marriage of his daughter Julia with Pompey, seemed to have secured his union with that general. From this time Pompey countenanced measures which, as a good citizen, he should have opposed as subversive of freedom. He allowed his own eulogist, Cicero, to be driven into banishment by the tribune Clodius; but, having afterwards himself quarrelled with Clodius, he had the former recalled. He supported the illegal nomination of Cæsar to a five years' command in Gaul; the fatal consequences of this compliance afterwards appeared. To maintain their power, Pompey and Crassus were a second time candidates for the consulship, which they obtained, though not without violence (B. C. 55). After the expiration of their year, Crassus went to his government in Asia, while Pompey, to whom Spain was assigned, remained at Rome, and exhibited shows to the people. Yet he did not entirely trust to the popular favour, but maintained an army to keep the citizens in awe. The fall of Crassus in Parthia left but two masters to the Roman world; and, on the death of Julia in childbed, these friends became rivals. Pompey, however, still retained so much good will towards Cæsar, that he sent him two legions to supply his losses.

As the troubles increased in the capital, it was the wish of some that Pompey should be named dictator; but Cato proposed, as a more regular mode of proceeding, to name him sole consul, which was done B. C. 52. As Cæsar's reputation as a general and his favour with the people continually increased, Pompey endeavoured to strengthen his influence by a union with the principal families. With this view, he married Cornelia, widow of the young Crassus, and daughter of Metellus Scipio, whom he made his colleague in the consulship; and he procured a rejection by the senate of Cæsar's request for a continuation of his command in Gaul. The most important offices were filled, by his influence, with the enemies of Cæsar, and he recalled the two legions which he had lent him. It was now proposed that both should lay down their commands; but Pompey's adherents objected that Cæsar's time had already expired, while Pompey's had not. It was soon evident that they were suspicious of each other, and that neither was inclined to return to a private station. Lucan, who in his sentiments was a Pompeian, says that Pompey could not bear an equal, nor Cæsar a superior. The former had certainly the forms of the law on his side, since the senate had recalled Cæsar, and confirmed Pompey in his command. In actual strength, the two rivals were very unequal. Pompey had never been equal in ability to Cæsar, and was now but the shadow of a great name. He himself was not conscious of this decline of his influence; and when Cicero, who found him deaf to all proposals of accommodation, asked him how he thought to oppose Cæsar, he replied, "I have only to stamp with my foot, and an army will arise out of the ground."

Cæsar had already (B. C. 49) laid siege to Ravenna, and was declared an enemy to his country by the senate, which, but too late for the activity of his rival, committed to Pompey the defence of the state. Cæsar passed the Rubicon, and approached the city. In sixty days, he subdued all Italy. Pompey, besieged in Brundusium, fled to Greece, where he collected a numerous army. Cæsar followed him, first offering terms of accommodation, then battle. Pompey declined both, and encamped before Dyrrachium. Cæsar surrounded him, but he broke through the enemy and escaped, though with a heavy loss. They finally met near Pharsalus, in Macedonia (B. C. 48). Pompey had been forced by his officers to engage, and showed himself unworthy of his fame. When he saw his troops thrown into disorder he retired to his tent, and remained in a state of stupefaction till the approach of the conquerors aroused him to attend to his safety. He fled through Larissa to the sea, and sailed to Lesbos. Here he found his faithful Cornelia, with whom and some friends he coasted along the shores of Asia. At Cyprus a council was held in regard to his future course. Pompey wished to go to Parthia, but, on the proposition of the Greek Theophanes, he proceeded towards Egypt, where he might expect a favourable reception from the young Ptolemy, whose father had received benefits from his hands. As soon as his approach to Egypt was known, the base ministers of the youthful king determined to possess themselves of his person, and put him to death. On his arrival, a boat was accordingly sent, with Achillas, the Egyptain general, and some Roman fugitives, inviting him to land. Pompey feared treachery, but it was now too late to recede. After tenderly taking leave of his wife and his son, he stepped into the boat. A numerous multitude on the shore awaited his approach; but before he had landed, the murderers struck him down. Covering his head with his toga, he expired without a groan. His head was separated from his body, and the trunk was left naked on the shore. A faithful freedman and a Roman soldier, who had served under Pompey, collected some wood, and burned the sad remains of him who had once been the master of Rome. When Cæsar arrived in Egypt, the head of his enemy was shown to him, but he turned away from the sight with tears, punished his murderers, caused the head to be solemnly interred, and over his grave erected a temple to Nemesis.

Pompey was fifty-nine years old at the time of his death; his name is among the most celebrated of antiquity (*clarum et venerabile nomen gentibus*). He was moderate in pleasure, free from extravagant luxury, and, in the highest pitch of his fortune, kind, mild, and humane, when not carried away by party spirit. His genius was various, and his mind was cultivated by philosophy and letters. If he was not a true patriot, his ambition was not to be the destroyer of freedom, but the chief of a free commonwealth; or, as Lucan says of him, *rector senatus, sed regnantis*. Incapable of sustaining himself at the height which he had reached, he fell rapidly, and lost some of his fame by the manner of his fall. Pompey left two sons, Cneius and Sextus. The former lost his life in the battle of Munda; the latter, after Cæsar's death, made himself formidable to the new triumvirs by sea, and was finally (B. C. 35) put to death, by the command of Antony, in Armenia, whither he had fled.

POMPEY'S PILLAR. See *Column*.

POMPONIUS MELA. See *Mela*.

PONCE DE LEON, JUAN, one of the early Spanish discoverers in America, was sent by Ovando to conquer the island of Porto Rico; and having there amassed great wealth, and received information of an island situated to the north, in which there was a miraculous fountain possessing the power of restoring youth to the aged, he sailed, in 1512, in quest of these happy shores. Although he was unable to find the fountain of youth, he discovered the country to which he gave the name of *Florida*. Ponce returned to Spain, and received from Ferdinand permission to colonize the island of Florida, as he called it, but soon after returned to Porto Rico without making any attempts at colonization. See Irving's *Discoveries of the Companions of Columbus*.

PONDICHERRY; since 1672, the capital of a French colony in the East Indies, on the Coromandel coast, in the Carnatic, lying in a sandy and dry plain, at the mouth of the Ariancupan, which here empties into the sea of Bengal; lat. 11° 55′ N.; lon. 79° 23′ E. It was first built, at a comparatively recent period, by some fugitives from Verapatam, and gradually increased to such a degree, that in 1761 it contained 70,000 inhabitants; but it has since declined, and at present has not above 25,000 inhabitants, who occupy different quarters of the town, according to national distinctions (Europeans, Mohammedans, Hindoos, &c.) Very delicate cotton fabrics, which employ about 5000 hands, are made in the town and territory. The houses of the town, formerly an important fortress, are handsomely built in the European style; and there are here several Roman Catholic churches, Hindoo temples, mosques, and some European institutions for education. The roadstead is very good, but there is no port. The territory, about eighty-five square miles, contains a population of 8000 natives. Pondicherry, on account of its favourable situation, is, in time of peace, the emporium of the French commerce with India. It was taken and destroyed by the British in 1761, restored in 1763, again taken in 1778, again restored by the peace of Versailles, in 1783; in 1793, it was taken possession of by the nabob of the Carnatic, in connexion with the British, and the fortifications were destroyed. By the peace of Amiens (1802), the town and territory were again restored to France, but again captured by the British, and retained until 1814. Since that time it has belonged to the French, who are bound, by the peace of Paris, not to restore the fortifications, and not to keep a larger number of troops than is required for purposes of police.

PONGO. See *Ape*.

PONIATOWSKI; the name of an illustrious Polish family, descended from an Italian stock. Joseph Salinguerra (born 1612), belonging to the old Italian family Torelli, having settled in Poland, after the murder of all his house by Ranuzio I., duke of Parma, took the name of Eziolek, and afterwards that of Poniatowski, from an estate Poniatow of his wife, the daughter of Albert Poniatowski and Anna Leczinska. His descendants received the title of *prince* in 1764, and the family still forms one of the thirty-six Roman ducal and princely families, but has not the same privileges with the thirty-five others.

Stanislaus, count Poniatowski (born 1678, died 1762) is known for his connexion with Charles XII., whom, after the battle of Pultawa, he followed into Turkey, and as whose ambassador at Constantinople he had the address to involve the Porte in a war with Russia. He wrote *Remarques d'un Seigneur Polonais sur l' Histoire de Charles XII. par Voltaire* (Hague, 1741).

His eldest son, *Stanislaus II. Augustus* (born 1732), the favourite of Catharine II., was elected king of Poland, under the influence of Russian bayonets, in 1764. He was an elegant and accomplished gentleman, with good intentions, but without the energy and firmness of purpose necessary to sustain a tottering throne, and bridle a licentious nobility. The Czartoryski family, with which he was connected, had sent him to Petersburg, to promote the election of prince Adam Czartoryski to the Polish throne, on which, however, the handsome ambassador was himself seated by Catharine's favour, and the Czartoryskis, finding they could not even rule in his name, began to intrigue against him. His attempts to remove the civil disabilities of the dissidents (q. v.), and to introduce some modifications into the Polish constitution, raised a powerful party against him. A confederation was accordingly formed, which was put down by Russian troops, and Poland was obliged to submit to a disadvantageous treaty (1767); but new confederations, at Bar (see *Poland*), Halics and Lublin, involved the country in the horrors of a civil war (1768). The Catholic confederates declared the throne vacant, and a body of conspirators, under count Pulaski seized the person of the king on the night of November 3, 1771. Being left alone with a person by the name of Koczinski, the king persuaded him to allow him to write to Warsaw, whence a guard was sent to conduct him home. Austrian and Prussian troops now filled the country, and most of the nobles, therefore, abandoned Stanislaus, and, in 1772, in spite of the remonstrances of the king and the senate, the first partition of Poland was made by the three great robbers, Russia, Prussia, and Austria. The king was now become totally dependent on the standing council, which was governed by the Russian ambassador. The Polish nobles at length discerned the true means of securing the independence of Poland. (See *Potocki*.) They obtained from Frederic William II. of Prussia a promise to stand by the republic, in case it should be attacked on account of its amendments of the constitution, and Prussia gave her consent to the constitution of May 3, 1791, which had been accepted by Stanislaus. In this situation, Stanislaus conducted with so much wisdom and dignity, as to recover the esteem and love of the nation. He also seemed determined to brave the resentment of Catharine; but, the connexion with Prussia having been broken, and the minority of the diet, which was opposed to the constitution, having procured a reversal of the proceedings, through Potocki and Rzewuski, from Vienna and Petersburg, the feeble Stanislaus gave way. The Polish army, notwithstanding the valour of Kosciusko, was not suited for a long resistance, and Stanislaus, who had sworn to perish with his people, rather than submit, acceded, at the request of Russia, to the confederation of Targowitz. He thus alienated the minds of the nation, without disarming Catharine. Prussia and Russia now proceeded to a second partition (1793), for the purpose, as they declared, of setting limits to Jacobinism in Poland. The king's opposition only served to expose him to personal abuse from the Russian general Rautenfeld, and the Russian ambassador, count Sievers. Catharine obliged him (1794) to sign the act of partition, which completed the political annihilation of the Polish state, and to abdicate the throne (November 25, 1795) on the anniversary of his coronation. He went to Petersburg, where he received a pension, living as a private individual, and died in 1798.

Joseph, the nephew of Stanislaus, born in 1763, served with courage against the Russians in 1792, and, on the accession of his uncle to the confederation of Targowitz, left the service, with most of the best officers. When the Poles attempted, in 1794, to drive the Russians out of the country, he again joined the Polish camp, as a volunteer. Kosciusko gave him the command of a division, at the head of which he distinguished himself at the two sieges of Warsaw. After the surrender of the city, he went to Vienna, and, rejecting the offers of Catharine and Paul, lived in retirement, on his return to Poland, at his estates near Warsaw. The creation of the duchy of Warsaw rekindled the hopes of the Polish patriots, and Poniatowski accepted the place of minister of war in the new state. In 1809, he commanded the Polish army against the superior Austrian force, which was sent to occupy the duchy, compelled it to retire, rather by skilful manœuvres than by force of arms, and penetrated into Galicia. In the war of 1812, against Russia (see *Russian-German War*), he was again at the head of the Polish forces, and distinguished himself in all the principal affairs of this chequered campaign. After the battle of Leipsic, during which Napoleon created him marshal of France, he was ordered (October 19) to cover the retreat of the French army. The enemy were already in possession of the suburbs of Leipsic, and had thrown light troops over the Elster, when the prince arrived, with a few followers, at the river, the bridge over which had been blown up by the French. Poniatowski, already wounded, plunged, with his horse, into the stream, which swallowed up horse and rider. His body was first found on the 24th, and buried with all the honours of his rank, on the 26th. It was afterwards removed to Warsaw, and, in 1816, was deposited in the cathedral at Cracow. Thorwaldsen has executed an equestrian statue of Poniatowski, for the city of Warsaw.

PONTA DELGADA. See *Michael's, St.*

PONTCHARTRAIN; a lake of Louisiana, about twenty-five miles long from east to west, and nearly the same in breadth. The water is generally from twelve to fourteen feet deep. It communicates with lake Borgne on the east, with lake Maurepas on the west, and with New Orleans on the south, by bayou St John and a canal, and also by a railroad. It is surrounded by marshes, and the landing is generally difficult.

PONTE-CORVO; a town in the States of the Church, sixty miles south-east from Rome, from which Bernadotte received the title of *Prince of Ponte-Corvo*. See *Charles XIV*.

PONTE-CORVO, PRINCE OF. See *Charles XIV*.

PONTIFEX; a priest, who served no particular divinity. Under Numa, who regulated the sacred rites of the Romans, there was only one pontifex. This number was afterwards increased to four, then to eight, and, under Sylla, to fifteen. The pontifices formed a particular college of priests, which superintended the affairs of religion, at the head of which was the pontifex maximus, the chief priest, whose duty was the inauguration of the priests, and, in earlier times, the care of the public records (*annales maximi*). He also superintended the sacred rites of Vesta. He held his office for life, and could not leave Italy. The emperors afterwards assumed this title. The pontifices had the supreme superintendence of the religious worship, and its ministers directed the religious solemnities, had the care of the calendar, and decided lawsuits which were connected with religion (hence the *jus pontificum*). The external badge of the pontifex, at least on solemn occasions, and while engaged in the duties of his office, was a dress bordered with purple (*toga prætexta*), and a tapering hat in the form of a cone, which was made of the skins of sacrificed animals (*tutulus* or *galerus*). The dresses of the superior clergy in the Roman Catholic church, which they wear particularly on festivals, are called *pontificalia*.

Pontificate is the dignity of the pontifex; likewise the papal dignity, as the pope himself is called, in Latin, *pontifex maximus*.

PONTIFICAL; the book containing the prayers and rites to be used by the pope and bishops in the exercise of their functions, as confirming, conferring orders, consecrating bishops and churches, &c. The Catholics think that pope Gelasius, a century before Gregory the Great, had already done something towards forming this collection.

PONTIFICALIBUS. See *In Pontificalibus.*

PONTIFICATE. The pope being called *pontiff*, the time of his government is called his *pontificate*.

PONTINE MARSHES; that tract of land in the papal dominions, south of Rome, which extends from Nettuno to Terracina: it is about forty-five miles long, and from four to eleven broad. The origin of these marshes, which must not be confounded with the Maremmas (q. v.), is lost in the most remote antiquity. Homer describes the abode of Circe (the promontory Monte Circello, near Terracina) as an island; and it is not improbable, that all these low grounds were once covered with the sea, as was the territory of Ravenna, on the eastern coast. In the early times of the Roman republic, there were, according to Pliny, on the testimony of former historians, thirty-three cities, situated in this region, all of which, either by wars, or perhaps by the increasing influence of the *miasma*, disappeared at a very early period. The principal city, Pometia, gave its name to the marshes, which are formed by great quantities of water, received from innumerable streams, which, rising in the neighbouring mountains, run into the plain, where, for want of a sufficient declivity towards the sea, they pass off very slowly, become stagnant, and at length lose themselves in the sand. The loss of so great a portion of fertile land, and the unwholesome vapours, which the south wind often carried even to Rome, early attracted the attention of the Romans (who thought no undertaking too difficult) to the means of remedying this evil. Appius Claudius (312 B. C.) probably made the first attempts at draining them, when he carried the celebrated Appian way through the marshes. He was succeeded in this attempt by the consul Cethegus. Julius Cæsar formed the gigantic plan of conducting the Tiber through the marshes; but he was prevented by death from its execution. Augustus contented himself with undertaking several canals. Under the succeeding emperors, these attempts to improve this part of the country were abandoned; and the water overflowed, till Nero renewed the work. Trajan continued it, during ten years, with so much spirit, that the whole tract from Treponti to Terracina was drained, and the Appian way was completely restored. During the political storms, which destroyed the Roman empire, the marshes also reverted to their former dreary condition. Under the Gothic king Theodoric, attempts were once more made to drain them, and, as it appears, not without success. But the operations were not long persevered in, and hostile nature soon resumed her rights. Among the popes, Boniface VIII. (who died in 1303) was the first who occupied himself with the draining of the marshes; and he caused a large canal to be dug, by means of which the country around Sezze and Sermonetta remains dry even to this day. Martin V. in 1417, likewise caused a great canal, the Rio Martino, to be dug, for the extension of which to the sea hardly a mile was wanting, when this undertaking, which would have supplied an outlet for all the streams, was interrupted by his death. Leo X. conferred the whole country upon Giuliano de' Medici, on condition that he would cause it to be drained. Yet during the 69 years of its continuance in the hands of the Medici, little or nothing was done towards this object. Sixtus V., who died in 1590, applied himself with zeal to this undertaking, and visited the country in person. He also caused a great canal, the Fiume Sisto, to be dug, and enclosed with dams, which, however, being too slightly built, shortly after his death gave way, so that the whole country became again as marshy as ever. After him, no pope had the courage, for a long time, to set about this work with earnestness. Pius VI. turned his attention again to the Pontine marshes. The levelling was performed with the greatest accuracy, the depths of the various canals and outlets were measured, the degree of declivity in the bed of the rivers ascertained, and, in 1778, the work was commenced. For ten years, it was continued at the greatest expense, till, in 1788, it was completed. But, notwithstanding every exertion, it was found impracticable to raise the low lands, and give them a proper slope for the numerous streams; yet the judiciously conducted canals, the cleansing of the beds of the different streams, whose slime filled the air with unwholesome vapours, the laying out of an excellent highway (Linea Pia), bore witness to the services rendered by Pius VI. to this country. During the French government these labours were also continued; yet it seems as if the old marshes would not submit to the restraint of cultivation. This country is not as frightful as it is usually represented; but it is very monotonous, and the predatory habits of the inhabitants, which the vigorous measures of the French government in some degree kept under restraint, have in later times resumed all their former lawlessness. It may further be observed, that this district contains a considerable extent of cultivated land, and immense pastures, where horses, cattle, and herds of buffaloes graze, and water-fowls (*folaghe*) start up with a rustling noise; towards the sea are great forests. The air, however, particularly in some seasons of the year, is yet very unwholesome; and hence the pale, sallow countenances of the few inhabitants, who are occupied mostly with hunting and fishing, and occasionally with highway robberies, when the fever to which they are subject permits them. The chief work on this subject is Prony's *Déscription hydrographique et historique des Marais Pontins* (according to their condition in the year 1811 to 1812); (Paris, 1823, 4to, with an atlas, folio.)

PONTON, or PONTOON, in war, denotes a little floating bridge made of boats and planks. The ponton is a machine consisting of two vessels at a little distance, joined by beams, with planks laid across for the passage of the cavalry, the cannon, infantry, &c., over a river, or an arm of the sea, &c.

PONTOPPIDAN, Eric, the younger, born at Aarhuis, in 1698, died in 1764, was bishop of Bergen, and wrote many historical and theological works, and also some Essays upon the Norwegian Language, and an Essay on the Natural History of Norway (transl. into English, London, 1755.)

PONTUS, in Asia Minor (so called from the sea on which it lay); the country from the Halys to Colchis, or the Pontic Cappadocia, as it was formerly joined with Cappadocia. The whole of Cappadocia was divided by the Persians into two satrapies, whence there arose, under the Macedonians, two distinct kingdoms. The oldest inhabitants were Tibarenes and Chalybees, not Chaldæans. Ritter (in his *Vorhalle*) thinks they were natives of India, and particularly descendants of the Buddhists at a period previous to the Brahmans. A son of the Persian king Darius, Artabazes, held these satrapies as a vassal, with the right to transmit them as an inheritance to his posterity. One of his successors, Mithridates, assisted the younger Cyrus, and refused to pay tribute to Artaxerxes. His son, Ariobarzanes I. made himself independent during the general insurrection of the governors of Asia Minor against Artaxerxes II. Mithridates II., who reigned B. C. 337, transferred his kingdom voluntarily to Alexander. Afterwards, in the division of his empire, in 322, it fell to Antigonus, who having attempted the death of Mithridates, the latter fled to Paphlagonia, where he found adherents, and successfully maintained himself. His successor, Mithridates III., enlarged his paternal kingdom by conquests. His son, Mithridates IV., drove back the Gauls, but was obliged to conclude the war against Sinope, because the Rhodians rendered assistance to this city. Pharnaces I. at length took possession of Sinope, and made it his residence. Mithridates Energetes, father of the celebrated Mithridates, aided the Romans in the third Punic and in the Pergamian war, and received from them Phrygia Major. He was murdered in 124. His son, Mithridates the Great, succeeded him, and carried on bloody wars with Rome until his death; at last he submitted to Pompey, and killed himself, 64 years B. C., from despair. His son Pharnaces obtained only the Bosphorus, and, when he attempted to conquer again his paternal kingdom, was vanquished by Cæsar, and put to death by Asander, who had made himself king of Bosphorus. Still his son Darius received through Antony a part of Pontus. Polèmo, who at the same time possessed the Bosphorus, Asia Minor, and Colchis, was his successor. After the death of his widow, Pythodoris, Polemo II. succeeded, as king of Pontus, A. D. 39. Nero took Bosphorus from him, and Pontus became, after Polemo's death, a Roman province. When the Latins, in 1204, again conquered Constantinople, Alexius Comnenus founded a new kingdom in Pontus, which remained until Mohammed II. united it, in 1461, with his great conquests.

PONTUS; son of Earth, and elder brother of Oceanus. (See *Oceanus*, and *Neptune*.) By his mother, he had Phorcys, Thaumas, Nereus, &c.

PONTUS EUXINUS; the ancient name for the Black sea, (q. v.) According to some, its Greek name, *Ευξεινος ποντος* (signifying *hospitable sea*), was given it on account of its beautiful scenery and fruitful coasts; according to others, it was at first called *Axenus* (*αξεινος*, inhospitable), on account of the barbarous character of the inhabitants along its shores; but, as these were softened by commercial intercourse, its name was changed to *Euxinus*.

POOH; an Eygptian god. See *Hieroglyphics*.

POOLO (from the modern Greek for *little*, from the ancient *παυλος*) is often found in geographical names, as *Poolo Samo* (Little Samos.) *Poolo* is often used as a diminutive; for instance, *Mariapoola* (little Mary). In the Malay languages, *poolo* signifies an island.

POOR, POORA (*city*, in Sanscrit); the termination of numerous geographical names in India east of the Ganges, as *Rajapoor* (royal city.)

POOR'S RATE is the name given in England to the taxes raised for the aid or support of those who cannot support themselves. See *Pauperism*.

POOTRA (in Sanscrit, *son*); a word appearing in many geographical names, as *Brahmapootra* (son of Bramah.)

POPAYAN; a city of New Grenada, situated in a large and fertile plain, watered by the Cauca, lying at the foot of the volcanic Purace. It is about eighty leagues south-west of Bogota, and eighty-five north-west of Quito; lat. 2° 26' north; lon. 76° 39' west. It is prettily built, and its elevation above the sea (5750 feet) renders the climate mild. Population, 25,000. It suffered much during the war of Colombian independence, and, in 1827, was almost entirely overthrown by an earthquake, which was accompanied by an eruption of the Purace and an overflow of the Cauca.

POPE (from the Greek παπας, father; see *Papas*) was the title of the bishop of Rome, long before he possessed the authority which is now connected with the name. From the end of the fourth century, he was the first among the five patriarchs or superior bishops of Christendom; for the circumstance that Rome was the ancient capital of the kingdom, and, according to tradition, the last dwelling-place of the apostle Peter, had long since given to him, as pretended successor of Peter, an extensive authority, but no peculiar jurisdiction over foreign dioceses. This, however, the popes obtained by the wealth of the Roman church, which had property in most other dioceses, by arbitration in ecclesiastical contentions, and by availing themselves of many opportunities favourable to the extension of their influence. A provincial synod at Sardica, in the year 344, and a decree of the emperor Valentinian III., in 445, had, indeed, acknowledged the bishop of Rome as primate, and as the last tribunal of appeal from the other bishops; but even in the West, where alone these edicts had the force of law, the measures of the popes, until the eighth century, often met with violent opposition. About this time, several circumstances contributed to open to them the way to supreme control over all churches. (See *Hierarchy*). Among these were the establishing new churches in Germany, which, like those of Britain at an earlier period, being founded by their missionaries, were at first subject to their power; the political confusion, and the change of government in Italy and France; the decretals of the pretended Isidore, forged between 830 and 850, probably by Benedict, a deacon of Mentz (which, in those times of ignorance, contributed much to support the claims of the Roman church to exercise supreme power, by supposititious letters and statutes of former bishops of Rome, dated back to the first centuries); the schism between the Eastern and Western churches, which bound the latter still more closely to the popes, as their leaders; the gradations of ecclesiastical rank, every where introduced by the ambition of the popes, all derived and gradually descending from them, who had usurped the highest place; and, finally, the personal superiority of some popes over their contemporaries. Thus Leo the Great, in the fifth century; Gregory I., called the Great, a zealous good, and able man, in the sixth century; and Leo III., who crowned Charlemagne, in the eighth century, had obtained for the papal title an authority which the patriarchs of the East could not attain, and against which the power of princes availed little. The story of the female pope, Johanna or Joan, an English woman, educated at Mentz and Athens, who, concealing her sex, rose by her learning and talent from the office of a notary at Rome to the papal chair, but, after a reign of two years and a half, was detected by becoming a mother, is a fable and satire. There were, indeed, unworthy popes during the middle ages; but, after the brilliant victory which Nicholas I. (who was first solemnly crowned) obtained over Lothaire, king of Lorraine, in the affair of a divorce in 865, and over the bishops of Treves and Cologne, whom he deposed by his papal authority; and after the example which John VIII. had given, in 875, of a disposal of the imperial crown, which he conferred on Charles the Bald,—the power of the popes could receive but little injury from the violence and corruption which prevailed in the papal see above a hundred years, beginning from the influence of the Tuscan counts at Rome, under Sergius III., in 904, and continued by the wicked and licentious favourites and relations of the infamous princesses Theodora and Marozia (one of whom, John XII., in 956, while but eighteen years old, and another, Benedict IX., in 1033, a boy of twelve years, obtained the dignity of pope), and even from the scandalous circumstance that, in 1045, three popes, chosen by means of bribery, were living together in Rome. The rudeness of the age concealed the scandal of such things.

In the midst of all this darkness, a ray of light appears in the reign of the excellent Sylvester II., between 999 and 1003, who was one of the most learned men of his time, and whom the world regarded as a magician. The troubles arising during the decline of the Carlovingian dynasty in France and Germany offered an extensive and continually enlarging field of action to the ambition of the popes; and their dignity and independence of the nobles and people of Rome, which they had often lost during the contentions of factions, were regained by them by the constitution of Nicholas II., in 1059, placing the right of election to the papal chair in the hands of the cardinals (see *Conclave*), to the exclusion of the laity. After this, a succession of good rulers, of great talents and excellent character, sat upon what was then the first throne in Christendom;—Gregory VII., who surpassed them all in spirit and in power, and who began to carry through, with wonderful perseverance, the project of universal dominion; Urban II., who was several times driven from Rome by the antipope Clement III., but who, from 1088 to 1099, ruled with extensive influence and extraordinary vigour; Alexander III., who, during his reign, between 1160 and 1181, survived two rivals, and overcame a third, who brought the kings of England and Scotland to unconditional obedience in religious matters, who made the emperor Frederic I. hold his stirrup, and confirmed the system of the election of popes; and Innocent III., whose reign, between 1198 and 1216, raised the papal see to the highest degree of power and dignity.

What the popes in earlier times had only attempted in peculiar circumstances, these great men, so superior to their age, made the settled usage, by a regular series of bold usurpations and persevering efforts. They united the clergy of western and central Europe closely to the papal see, by the introduction of a new form of oath, by the law of celibacy, and by the law of investiture, which broke the union of bishops with their temporal princes, and, under Innocent III., was extended to a power of disposing, at pleasure, of all the dignities and benefices of the church. By means of their legates and nuncios, they obtained the bishop's right of deciding in ecclesiastical and matrimonial affairs, and the exclusive right of canonization; and they thus made the popes the sole fountain of ecclesiastical dignity and power in western Christendom. By eventually assuming the sole right of convening councils and national synods (whose decrees became valid only by being ratified by the pope), and by maintaining, with more and more boldness, their claims to infallibility, they at length obtained complete dominion over the church. Of the orders of monks, especially of the mendicant orders, they created a spiritual army, who, having in their hands the inquisition, the right of hearing confessions, and of preaching, together with the public superintendence of schools and universities, became the most useful instrument of their policy, and one of the strongest supports of their power. The success of these advances towards unlimited spiritual dominion, gave them courage to strive also after temporal power.

But the claims of the popes to worldly dominion are of much later origin than the historians of the court of Rome have maintained. Constantine the Great gave them merely some buildings and estates in and near Rome. By the gift of Pepin (see *Church, States of the*) the pope obtained merely the *dominium utile*, that is, the use of lands intrusted to him. In this way he became, in a manner, a vassal of the Frankish kings, and afterwards of the German emperors, who exercised, without opposition, the right of sovereignty over the papal dominions, and, until the twelfth century, suffered no election of pope to take place without their ratification. Innocent III. first established the rule that Rome, the Marches, and the hereditary possessions of Matilda (q. v.), should do him homage, as lord paramount, in 1198; and thus vanished the last shadow of the power of the emperors over Rome and the pope. Favourable circumstances had already made several kingdoms tributary to the papal see. England, from the time of its conversion to Christianity, was thus dependent upon them; in like manner, Poland and Hungary, from the eleventh century, Bulgaria and Aragon, from the beginning of the thirteenth, and the kingdom of the Two Sicilies (whose Norman kings had been vassals of the pope, from 1265, when Clement IV. gave it to the house of Anjou through hatred towards the house of Hohenstaufen. Even the East would have fallen under the power of Rome, if the success of the crusades (which had given rise in the West to much confusion in regard to the rights of citizens and private property, and thereby promoted the influence of the pope) had been less transitory. Innocent III. dared to depose and proclaim kings, as, for instance, John of England, and to threaten the whole world with excommunication. The emperor Otho IV. called himself such by the grace of God and of the pope. Kings were called *sons of the pope;* and the fear of the terrible consequences of the interdict, which they pronounced, as vicars of Christ, upon disobedient princes and their kingdoms, the rebellious spirit of the barons, the ill regulated constitution of states, and the great want of laws, subjected the rulers of those times to the authority of a lord, whose court was the cradle of modern politics, and whose power and influence were irresistible, because supported by public opinion and by superstition. It was with reason, then, that popery, at that time, was called a *universal monarchy;* the cardinals being counsellors; the legates in the different kingdoms of Europe, viceroys; the archbishops and bishops, governors and lieutenant-governors; the priests, ministers of police and of the finances; and the religious orders, the standing armies of the Roman pastor; who thus had at his beck 300,000 servants of different ranks, scattered among the different nations, entirely devoted to his interest, and powerful by the arms of religion and fanaticism. In fact, this priestly government did good by accustoming the rude princes and people to laws and Christian manners; and, at a time when rights were first beginning to be understood, its inconsistency with true independence was not felt.

France alone, which had acquired more consistency and power than the other monarchies of Europe, by the subjugation of the great vassals, and the reduction of their territories under the royal government, first successfully resisted the popes. In Philip the Fair, Boniface VIII., one of the boldest and most able popes, found a master, and his successors, during their residence at Avignon, between 1306 and 1376, remained under French influence. The independence of the popes visibly suffered from the circumstance that they were now bound to a particular political party, though they continued to exercise, over all the Christian countries of the West, the power which their arts and perseverance had obtained. Their dignity sunk still lower when, in 1378, two rival popes appeared—the Italian Urban VI., and a count of Geneva, chosen by the French cardinals, who took the name of *Clement VII.* Europe was divided by their quarrel, the Italian being supported by Italy, Germany, England and the northern kingdoms, the French pope by France, Spain, Savoy, Lorraine and Scotland; and the schism long remained. The public sale of offices, the shameful extortions and the low artifices, which most of these rival popes used against each other, gave rise in England and Bohemia (see *Huss*), to much complaint, and to demands for a reform in the state of the church. The council of Constance had, indeed, succeeded in putting an end to the great schism, by deposing both of the rivals; but pope Martin V., who was chosen, in 1417, in their place, did not correct the abuses which had grown up under his predecessors, and even the most express decrees for reform, passed by the council of Basle, were rendered nugatory by the artifices and the perseverance of Eugene IV., of the house of Ursini, who was pope between 1431 and 1477. He had gained the friendship of France, in 1438, by the pragmatic sanction, which laid the foundation of the freedom of the Gallican church; and the negotiations of Æneas Sylvius, ambassador of Frederic III., with him and his successor, the excellent Nicholas V., a friend to ancient literature, and the protector of the learned exiles from Greece, effected the concordate of Vienna, in 1448. Why the grievances of the German nation were so little remedied by this instrument, while the interest of the pope was carefully attended to, the German princes, whom the eloquence of the cunning negotiator Æneas Sylvius had induced to accept it, first perceived when he was chosen cardinal, and, in 1458, pope, under the name of *Pius II.* In this concordate, the popes obtained the confirmation of the annates, of the right of ratifying the election of prelates, and, among many other privileges, that of the *pope's months*, so called, or the right of conferring benefices (which they exercised alternately with the founders), not on the occurrence of vacancies, but on particular months, of which six in every year were reserved to the pope. By a general extension of this privilege, to which, under different pretences, the other Christian kingdoms were obliged to submit, the popes in the fifteenth century, had gone so far, that full half of the ecclesiastical revenues of the West flowed into their coffers, under various pretences. Assistance against the Turks was the most common pretext; but rarely were any of the immense sums thus collected so employed. It was necessary to buy the favour of the parties in Rome, among which the old families of Colonna and Ursini had long been rivals; and so much was spent on their relations (see *Nepotism*), that very little remained for the common good of Christendom.

In care for his family, no pope ever surpassed Alexander VI., between 1492 and 1503, whose policy and whose private life were equally strangers to morality and religion. His successor, Julius II., between 1503 and 1513, employed all his powers in politics, and in a war with France, in which he commanded his own army, but was obliged to fly before Bayard. Fortunately for him and for his successor, Leo X., Maximilian I. was prevented by circumstances, and finally by death, from uniting upon his own head the papal and imperial crowns. The circumstance that Austria, France, and Spain were fighting for Lombardy and Naples, and, therefore, sought alternately the favour of the pope, had caused the latter to rise anew in political importance towards the end of the fifteenth century; but the spirit of the times was acquiring an irresistible strength, and the policy of Leo X. was of no avail against it. Luther, Zwinglius, and Calvin were the heralds of an opposition which tore almost half of the West from the popes, while the policy of Charles V. was at the same time diminishing their power. What the ages of ignorance had allowed to the pope, the council of Trent, indeed, now ratified; and the society of the Jesuits came forward as the guards of his throne, striving to erase all traces of the reformation in the states which had remained Catholic, and to regain by missions among the heathen what had been lost in Europe; yet neither this new support, nor the policy of artful popes, such as Clement VII., between 1523 and 1534 (whom Charles of Bourbon, the general of the emperor, drove, in 1527, into the castle of St Angelo), and Paul III., between 1534 and 1549, who gained for his family Parma and Piacenza; nor the monkish devotion of Paul IV., between 1555 and 1559; nor the moderation of Pius IV., between 1559 and 1566, who condescended to grant the cup to the Bohemian Hussites; nor the severity of Pius V., between 1566 and 1572 (who offended both princes and people by his bull *In cœna Domini*, worthy of his previous character as a proud Dominican, and furious persecutor of heretics, although his severe austerity obtained him the honour of canonization); still less the useful activity of Gregory XIII., between 1572 and 1585, who gave to the world the amended calendar (Gregorian); the magnanimity and wisdom of Sixtus V., between 1585 and 1590; the good fortune of Clement VIII. (Aldobrandini), between 1592 and 1605, who, in 1597, added Ferrara to the States of the Church; the learning of Urban VIII., between 1623 and 1644, who added Urbino to his dominions, and obliged Galileo to abjure his doctrine of the motion of the earth round the sun,—could restore the old authority of the papal throne. In vain did the court of Rome employ the language of Gregory VII. and Innocent III.; even in Catholic states, the distinction between ecclesiastical and political affairs had been perceived so clearly, that the influence of the popes upon the latter was now very limited.

Since the middle of the sixteenth century, no German emperor had been crowned by a pope. The princes, who had learned his policy, withdrew themselves from his authority. The national churches obtained their freedom, in spite of all opposition, and the peace of Westphalia, which the papal see never acknowledged, gave public legality, guaranteed by all the powers of Europe, to a system of toleration which was in direct contradiction to the papal doctrines. Under such circumstances, the question no longer was, how to extend the papal authority, but how to prevent its utter destruction; and the vicar of Christ, who, when he began to call himself servant of servants, was lord of lords, was obliged to play the part of a suppliant, who claims compassion and toleration, rather than obedience. Jansenism, also, took from the popes a considerable part of the Netherlands; their bulls were no longer of avail, beyond the States of the Church, without the consent of the sovereigns, and the revenues from foreign kingdoms grew smaller and smaller. In France, and soon after in Germany, they became the objects of ridicule; and the excellent men who occupied the pontifical chair in the eighteenth century, the learned Lambertini, from 1740 to 1758 (see *Benedict XIV.*), and the enlightened Ganganelli, from 1769 to 1774 (see *Clement XIV.*), were forced to expiate the guilt of their predecessors, and sought to obtain by patience, condescension, and personal merit, the esteem which the others had haughtily claimed.

Still greater misfortunes fell upon their successors, Pius VI., from 1775 to 1798, and Pius VII., 1800 to 1823. The first, after a bitter experience of the progress of knowledge, just when the death of Joseph II., had inspired him with new hopes (see *Nuncio*), was witness of the revolution, which tore from him the French church, and deprived him of his dominions. The other was forced to buy his personal freedom, and the possession of his diminished states, by an equivocal concordate with Bonaparte, in 1801, and by much personal humiliation, and lost them both again in 1809. He owed his restoration, in 1814, not to the excommunication which he had pronounced against Napoleon, but to a coalition of temporal princes, among whom were two heretics (the English and Prussian) and a schismatic (the Russian). Nevertheless, he not only restored the inquisition, the order of the Jesuits, and other religious orders, but advanced claims and principles entirely opposed to the ideas and resolutions of his liberators. The return of this pope to the spirit of the eleventh and twelfth centuries agreed with what was always the principal maxim of the Roman court, "never to give up the slightest of its claims, but to wait only for opportunities." When the archives of the popes were carried to Paris, in 1809, among other surprising things, a practice came to light which the popes had, of declaring null and void, by secret mental reservation, the contracts which were made in public. Thus Alexander VII., February 18, 1664, made such a reservation with regard to the treaty of Pisa, of the 12th of the same month, and Clement XIII., September 3, 1764 (see *Clement XIII.*), with regard to the banishment of the Jesuits from France. Pius VII. openly declared against the tolerance of the philosophic sects, against Bible societies, and translations of the Bible. (See *Pius VII.*) In the mean time, there appeared in the French and German Catholic churches, a spirit of freedom, and an increasing wish for an independent national church, which is very visible in the negotiations that preceded the conclusion of the last concordate. Respecting the temporal dominions of the pope, see *Church, States of the.*

Pope (by a Catholic). [Having given in the preceding article the Protestant views of the papal history, we shall now give the views of a German Catholic on the origin and character of the papal power.] The pope is the head of the Catholic hierarchy. It was necessary that the power of the church should be concentrated in some one, whose especial care it should be to provide for the maintenance of the Christian faith, and whatever is connected with it. Christ ordained this unity of power on that occasion when one of the apostles, first of all, acknowledged the divinity of his Master. When walking with his apostles, he turned and said: "But whom say ye that I am? And Simon Peter answered and said, Thou art Christ, the Son of the living God. And Jesus answered and said to him, Blessed art thou, Simon Bar-jona; for flesh and blood hath not revealed it unto thee, but my Father, which is in heaven. And I say also unto thee, that thou art Peter (which means a *rock*); and upon this rock will I build my church; and the gates of hell shall not prevail against it. And I will give unto thee the keys of the kingdom of heaven; and whatsoever thou shalt bind on earth, shall be bound in heaven; and whatsoever thou shalt loose on earth, shall be loosed in heaven." (*Matthew* xvi. 13—19.) However clear this passage may be, it has not been without mistaken interpreters, who have perverted the sense, saying that at the words "on this rock," Christ pointed with his finger to himself. The learned Michaelis rejects this explanation of some of his Protestant brethren, saying that the finger is not the finger of Christ, but that of the contentious interpreter. The power to bind and to loose, and the office of preaching Christianity, were afterwards, indeed, given to all the other apostles; but no other one is declared to be the rock upon which the church should be built. This rock was one only, Simon, son of Jonas, called *Peter*. After his resurrection, Christ appeared for the third time to his disciples assembled at the sea of Tiberias. "So when they had dined, Jesus saith to Simon Peter, Simon, son of Jonas, lovest thou me more than these? He saith unto him, Yea, Lord; thou knowest that I love thee. He saith unto him, Feed my lambs. He saith unto him again the second time, Simon, son of Jonas, lovest thou me? He saith unto him, Yea, Lord; thou knowest that I love thee. He saith unto him, Feed my sheep. He saith unto him the third time, Simon, son of Jonas, lovest thou me? Peter was grieved, because he said unto him the third time, Lovest thou me? And he said unto him, Lord, thou knowest all things; thou knowest that I love thee. Jesus saith unto him, Feed my sheep. Verily, verily, I say unto thee, when thou wast young, thou girdedst thyself, and walkedst whither thou wouldest; but when thou shalt be old, thou shalt stretch forth thy hands, and another shall gird thee, and carry thee whither thou wouldest not. This spake he, signifying by what death he should glorify God. And when he had spoken this, he said unto him, Follow me." (*John* xxi. 1—19.) That these repeated assurances of love, and these repeated commands to feed the sheep, had some peculiar signification, and that, together with the passage in Matthew xvi. 13—19, they were intended to show the supremacy of Peter, was always taught by the fathers of the church. In other passages of holy writ, this preference of Peter is also shown. Passages like this, "Simon, and those with him" (*Mark* i. 36); "Peter, standing with the eleven" (*Acts* ii. 14); "Peter, arising in the midst of the brethren" (*Acts* i. 15), obviously refer to the precedence granted to him in other places. In the first synod of the apostles at Jerusalem, the superior rank of Peter cannot be mistaken. (*Acts* xv. 17.) This precedence was not merely an honour, but had for its object the unity of the church; it was a true official power. The power which Christ gave to his apostles did not cease with their death, but was transmitted to their successors. This is what all Christian antiquity has taught, and this was needed by the church, which was a permanent institution, requiring continual direction.

This power of the first of the apostles was also exercised by his successor. This successor was, as all antiquity tells us, the bishop of Rome. This supremacy of the Roman bishop has, with the lapse of time unfolded itself more and more, and sometimes taken a wrong direction; but it was first exercised by Peter; it is as old as Christianity, and did not originate in subsequent times. As far back as the first century, we find traces of the power exercised by Clement, bishop of Rome, as successor of Peter. He appeased the contentions of the restless Corinthians, part of whom requested his assistance. Recourse was had to him, although other churches were situated nearer, as those of Smyrna, Ephesus, &c., which were likewise superintended by disciples of the apostles, and, in all probability, while the apostle John was yet living. Clement not only sharply reproved the Corinthians, but declared to them that if they did not submit to his commands, they should be regarded as disobedient. This epistle was read in many churches until the time of Eusebius. (Eusebius, *Historia Ecclesiæ*, l. iii. c. 12.) At the end of the first century, a certain Dionysius was sent by Clement on a mission to Gaul, and in fact undertook the mission at his order. In the second century, Marcion travelled from distant Pontus to Rome, that he might there be again admitted into the society of the church, from which he had been excluded by his bishop. Cerdo was restored to his place, in Rome. St Irenæus said, "It is necessary that the whole church, that is, believers every where, should hold to this church (the Roman), on account of its great superiority, for the apostolic tradition has been preserved in this church." In another place he says that he should regard as heretics, schismatics, and obstinate persons, all those, wherever they might be, who should deny the supremacy of the successors of Peter over the church. In the third century, Origen, Cyprian, and many others, appealed to Rome. Thus many things in the time of primitive Christianity concur to prove the supremacy of Rome.

The church, in its constitution, is like an association of states, at whose head stands the pope; his government cannot be called, however, a monarchy, but resembles more the imperial form. As is commonly the case in such united governments, so in the spiritual constitution, the power of him who should control all, is sometimes too great, and sometimes too feeble. The power of the pope, at first lawful, afterwards increased with the lapse of time; and the principle was generally adopted, that the bishops of the church were merely his assistants —a principle from which proceeded the forged decrees of Isidore, belonging to the ninth century, where it is not first advanced, but taken for granted as a well established fact. The splendour and power of the papal see was greatly increased also by its union with the emperors, in the middle ages. This union was both favourable to the civilization and the peace of Europe, and beneficial to the spiritual authority of the pope; and at last gave to the pope supremacy over the Western world. The quarrels of the popes with temporal rulers not only caused the downfall of the temporal power of the holy see over the European states, but, in the reaction which they produced, even gave to the rulers great influence over the church. The spiritual power of the popes was now brought back to its former limits. Abuses, which the possession of power renders so easy, had caused a general desire of a reformation, both in the head and members of the church. The council of Constance, in 1414, declared itself competent to undertake this reform, and actually deposed two rival popes; and the decrees of the council at Basle were still more energetic. The discovery of the forgery of the decretals of Isidore—a natural consequence of a more attentive study of history in modern times—by the *centuriatores* of Magdeburg—and the ideas which the reformation introduced — contributed to circumscribe, within just limits, the spiritual power of the pope. In the eighteenth century, the investigations of Febronius (the suffragan bishop of Treves) mainly contributed to shake the foundation of many of the adventitious rights of the pope.

This is the place to explain the system of the Catholic canonists with regard to the power of the pope. First, of his influence in temporal concerns. The canonists of the middle ages derived from the example of Gregory VII., and others, a right of the pope to immediate interference in worldly matters. Their argument was a very simple one: The church is the highest of all institutions for the good of men, and all other merely temporal institutions should be subject to it; the head of this institution is the vicar of Christ, made such by divine appointment. Peter was the first, and his successors have inherited his power. Like Peter, the popes have held the double sword (the symbol of temporal and spiritual power), and with this, the right of subjecting every thing to the objects of the church, as the highest moral institution, and of ruling, either in concurrence with the temporal power, or in preference to it, since the eternal is superior to the temporal, and the objects of the first are more exalted than those of the last. Bellarmin afterwards varied from this opinion, asserting an indirect power of the pope over temporal affairs, as, for instance, the right of reducing within proper limits, for the salvation of his soul, any one who made a bad use of temporal power. The present age, however, believes neither in the direct nor the indirect power of the pope over temporal affairs, and no one any longer defends that opinion. As to the spiritual power of the pope, all the true Catholic canonists agree that the supremacy of Peter and his successors (and not only the dignity, but also the jurisdiction) are of divine appointment. That the seat of supreme power is now at Rome, is accidental; we do not affirm, however, that it can be transferred from Rome without the consent of the whole church. This power is of divine appointment, and certain rights are essential to it; those, for instance, without which its object, unity in the church, could not be attained.

Other rights have been accidentally acquired in the course of time; they have a historical foundation, but they are not necessary to the existence of the supreme power. The former, therefore, are called *essential*; the latter, *adventitious*.

The essential rights are, I. The right of superintendence over the whole church. To this belong, 1. The right of requiring from all bishops an account of the state of their churches (*jus relationum*); both in the Eastern and Western churches, we see a continual acknowledgment of this right in the earliest times; the church ordained in the council of Trent, that the bishops should, every five years, send to the pope an account of the state of their diocese (*relatio de statu*); 2. another right is that of sending legates into the different countries of Christendom; in cases for which the requiring of reports was insufficient, it became necessary that information should be obtained by means of legates in the country and on the spot; 3. the right of convoking general councils, of holding the presidency there, and of ratifying the decrees; 4. the right of pronouncing provisional sentences, in disputes on matters of faith.

Another class of essential rights was, II. The right of superintending the observance of the laws of the church. To this belong, 1. the right of passing new laws, and of enforcing the observation of those which already exist; the bishops have a just right to protest against new laws, and they do not become binding until the whole church has accepted them; 2. the right of dispensing with existing laws—a right which, as history tells us, was exercised beyond what was necessary, but which in general was indispensable, as the laws could not extend to every case; 3. the right of annulling unjust grants of episcopal dignities (*jus devolutionis*)—an essential right, and one without which the right of superintendence would be of little avail. In reality, this right was also carried too far, and, was not properly limited until modern times.

The adventitious rights are the following: 1. The right of censorship over all writings relating to the doctrines of the Catholic church; 2. the right of regulating the general liturgy; 3. the right of canonization, and of deciding upon the authenticity of the relics of the saints, and the degree of honour due to them; 4. the right of appointing and abolishing festivals; 5. the right of appointing fasts, and days of humiliation for the whole church; 6. the right of dispensing from vows (see *Vows*), and of declaring the invalidity of oaths obtained by fraud or violence, or of setting them aside, where other circumstances seemed imperiously to require it; 7. the right of being consulted in regard to the alienation of the property of the church; 8. the right of imposing taxes upon the clergy, or of exacting from them other contributions (*jus decimandi*); 9. the right of raising certain taxes (*annates*) for the support of the pope and his court (it has produced but a small income in modern times); 10. the right of reserving to themselves the appointment to the benefices of the church (by *mandata de providendo*, by *expectativæ*, or by *reservationes*); 11. the right of establishing and suppressing religious orders; 12. the right of confirming bishops (and coadjutors) and of deposing them (in a lawful way); 13. the right of granting dispensations; 14. the right of conferring the *pallium*. These are the adventitious rights; they can pass away by time (and many have passed away), as they grew with the lapse of time. We do not mean to say that they can be arbitrarily denied to the pope by individuals.

Among the rights of the popes, which were formerly the subject of dispute, were their infallibility and supremacy over the councils,—rights which the German canonists no longer maintain. (See *Infallibility*.) The pope is likewise a temporal monarch, as the bishops of Germany formerly were. The States of the Church, like all the states of the middle ages, grew up gradually. A temporal sovereignty was necessary for the pope, as he was to be the organ of the church, the opponent of thrones, and independent of them. As man is still human, though he wear the tiara, we cannot wonder, nor is it a cause of reproach against the church, that it has produced vicious popes. But no dynasty of Europe can show that it has had, during the last few centuries, such a long series of excellent men. By the institutions connected with the papal power, care is taken that it shall be less arbitrary than that of any other ruler in Europe.

POPE, ALEXANDER, a celebrated English poet, was born May 22, 1688, in Lombard street, London, where his father, a linen-draper, acquired a considerable fortune. Both his parents were Roman Catholics. Soon after the birth of his son, who was of very delicate constitution, small, and much deformed, the father of Pope retired from business to a small house at Binfield, near Windsor forest; and, on account of his attachment to the exiled king, not choosing to vest his property in the public securities, he lived frugally on the capital. The young poet was taught to read and write at home, and, at the age of eight, was placed under the care of a Catholic priest, named Taverner, from whom he learned the rudiments of Latin and Greek. Being fond of reading, he became acquainted, at this early period, with Ogilby's version of Homer, and Sandys' translation of Ovid's Metamorphoses, which books first turned his attention to poetry. He was successively placed at two other schools, the first at Twyford, and the second at Hyde-park-corner, where he formed a play taken from Ogilby's Homer, intermixed with verses of his own, and had it acted by his school-fellows. About his twelfth year, he was taken home, and privately instructed by another priest; and to this period is assigned his earliest printed poem, the Ode on Solitude. He subsequently appears to have been the director of his own studies, in which the cultivation of poetry occupied his chief attention. He particularly exercised himself in imitation and translation, of which his versions of the first book of the Thebais and of the Sappho to Phaon, made at the age of fourteen, afford a remarkable testimony. He was sixteen when he wrote his pastorals, which procured him the notice of several eminent persons. His ode for St Cecilia's Day and Essay on Criticism were his next performances of note, the latter of which was written in 1709, and published in 1711, in which year, also, appeared his Elegy on an Unfortunate Lady. He became embroiled with Ambrose Philips in consequence of an ironical comparison of that writer's pastorals with his own in the Guardian, and with the irascible critic John Dennis, owing to a humorous allusion to him under the name of *Appius*, in the Essay on Criticism. The Elegy on an Unfortunate Lady was followed by the Rape of the Lock, grounded on a trifling incident in fashionable life. In this production the poet displays admirable vivacity and the most polished wit, but its imaginative power is chiefly conspicuous in the exquisite machinery of the sylphs, wrought into it as an afterthought; for the poem first appeared without it. This addition was opposed by Addison—a piece of advice which Pope subsequently, upon no very direct evidence, attributed to literary jealousy. He next published the Temple of Fame, altered and modernized from Chaucer, which was followed, in 1713, by his Windsor Forest, commenced at sixteen. In the same year, he published proposals for a translation of the Iliad, by subscription, which were received with great encouragement; and the first volume, containing four books, appeared in 1715 (in 4to). An open breach with Addison preceded this publication, owing to an alleged jealousy on the part of the latter, to whom a rival translation of Homer, published under the name of Tickell, was attributed by Pope. Whether by Addison or Tickell, the rival version soon sank before that of Pope, who was enabled, by the great success of his subscription, to take a handsome house at Twickenham, to which he removed with his father and mother. About this time, he wrote his impassioned Epistle from Eloisa to Abelard, one of the most vivid and impressive of all amatory poems. In 1717, he republished his poetry in a quarto volume, to which he prefixed an elegant preface, and in 1720, completed the Iliad. In 1721, he undertook the editorship of Shakspeare's works—a task for which he was wholly unfit; and a severe castigation from Theobald laid the foundation of a lasting enmity between them. With the assistance of Broome and Fenton, he also accomplished a translation of the Odyssey, the subscription to which brought him a considerable sum. In the mean time, he had formed a friendship with Martha Blount, the daughter of a Catholic gentleman near Reading, who became his intimate *confidante* and companion through life. A sort of literary flirtation also commenced with the celebrated lady Mary Wortley Montagu, which, after much intercourse and correspondence, terminated (See *Montagu, lady Mary Wortley*) in the bitterest enmity. In 1727, he joined Swift in a publication of Miscellanies, in which he inserted a treatise Of the Bathos, or Art of Sinking, illustrated by examples from the inferior poets of the day. In 1728, he sent out the three first books of his Dunciad, a mock-heroic poem, the object of which was to overwhelm his antagonists with ridicule. It is a finished example of diction and versification, but displays much irritability, illiberality and injustice. Personal satire, to which he was first encouraged by bishop Atterbury, appears in most of his subsequent productions. Being particularly connected with the tory party, he had become intimate with lord Bolingbroke, to whose suggestion the world is indebted for the Essay on Man, first published anonymously in 1733, and the next year completed, and avowed by the author. This work stands in the first class of ethical poems. It was followed by Imitations of Horace, accompanied by a Prologue and Epilogue to the Satires, and by Moral Epistles or Essays, which exhibit him as a satirist of the school of Boileau, with more spirit and poetry, and equal causticity. The persons whom, in these works, he treats with most severity are lady Mary W. Montagu and lord Hervey. Curll, the bookseller, having published some letters written by Pope, the latter affected great anger; yet there is some evidence to countenance the notion that he contrived the plot himself, in order to form an excuse for the publication of a quarto volume of letters, in his own name, for which he took subscriptions. They are elegant and sprightly, although studied and artificial; but, as many characteristic epistles are given from those of his correspondents, the collection is interesting and valuable. In 1742, at the suggestion of Warburton, he added a fourth book to his Dunciad, intended to ridicule useless and frivolous studies, in which he attacked Colley Cibber, then poet-laureate. Cibber retaliated by a pamphlet, which told some ludicrous stories of his antagonist, and so irritated the latter, that, in a new edition of the Dunciad, he deposed Theobald, its original hero, and promoted Cibber in his place, who, although a great coxcomb, could scarcely be deemed a dunce.—An oppressive asthma began now to indicate a commencing decline; and, in this state of debility, he was consoled by the affectionate attention of his friends, and particularly of lord Bolingbroke. When the last scene was approaching, he allowed one of his intimates, the historian Hooke, himself a Catholic, to send for a priest, not as essential, but becoming; and, soon after, quietly expired, May 30, 1744, at the age of fifty-six. He was interred at Twickenham, where a monument was erected to him by bishop Warburton, his legatee.

Both the moral and poetical character of Pope has, within these last few years, been assailed and defended with peculiar animation. Vain and irascible, he seems to have been equally open to flattery and prone to resentment; but one of his greatest weaknesses was a disposition to artifice, in order to acquire reputation and applause, which is justly deemed indicative of littleness of mind. He was not, however, incapable of generous and elevated sentiments, and was as firm in his attachments as implacable in his dislikes. He had always a dignified regard to his independence, which, in one to whom money, high connexions, and the superfluities of life, more especially the luxuries of the table, were by no means indifferent, is the more remarkable. He has been accused of meanness towards his literary coadjutors; but certain stories, of a nature to impeach his integrity, are now no longer believed, especially as something like an indisposition to do him justice, either as a poet or a man, has been manifest in those who related them. As a poet, while his claim to invention is bounded, the endeavour to set him aside altogether, in compliment to certain metaphysical distinctions in regard to the primary sources of poetic feeling, is factitious and futile. No English writer has carried further correctness of versification, splendour of diction, and the truly poetical art of vivifying and adorning every subject that he touched. His Rape of the Lock, and Epistle from Eloisa to Abelard, are alone sufficient to impeach the exclusive theory which would deny him the rank and powers of a poet, leaving his wit, his brilliancy and his satire to be ranked as they may be. Of the various editions of Pope's works, it is only necessary to mention that of Warburton (excluding the Homer, 9 vols., 8vo), and those of Johnson, Warton and Bowles (the last in ten vols., 8vo, 1806).

POPISH PLOT; a contrivance got up by Oates (q. v.) in 1678, for the purpose of bringing himself into notice, and adopted by some political leaders to promote their own party schemes. Oates pretended to have discovered a conspiracy, formed by the Jesuits and Roman Catholics, for murdering the king (Charles II.), and subverting the Protestant religion; and, after some preliminary steps, he went to Sir Edmondbury Godfrey, a justice of peace, and gave evidence before him of all the articles of the pretended conspiracy. Among the persons accused was Coleman, secretary to the duchess of York, among whose papers was found a correspondence with some Catholics abroad, which contained expressions of great violence and indiscretion, but nothing to countenance the notion of such a plot. In the midst of the alarm created by this pretended revelation, Godfrey was found dead in a ditch (October 17), having, probably, committed suicide; but the cry was immediately raised that he had been murdered by the papists on account of his taking Oates's evidence. Parliament met soon after this event, and the two houses immediately began to occupy themselves with examinations in regard to the plot. The excitement was encouraged in parliament by artful party leaders, and the two houses voted, "that there had been and still was a damnable and hellish plot, contrived and carried on by the papist recusants, for assassinating the king, subverting the government, and rooting out the Protestant religion." The encouragement held out to Oates, who received a pension of £1200, brought forward Bedloe, a noted thief and impostor, who confirmed Oates's statements, with some additions of his own. He accused several noblemen by name of a design to raise forces in different parts of the kingdom, with which they were to join an army of 20,000 or 30,000 crusaders to be landed from Spain. Although no arms, after the most rigorous search, no ammunition, no money, no commissions, no papers, no letters, were discovered to confirm the evidence of these men, yet the story obtained general belief, and excited a general panic. To increase the excitement, Bedloe published a pamphlet, entitled, A Discovery of the horrid Popish Plot, for burning London and Westminster, &c., in which all the fires that had happened for several years were ascribed to the Jesuits. Meanwhile the pretended conspirators were brought to trial. Coleman, father Ireland, a Jesuit, and Grove and Pickering, who, it was pretended, were engaged to shoot the king, were condemned to death, on the testimony of Oates and Bedloe, and executed. The pretended murderers of Godfrey next suffered the same fate, on the sole testimony of Bedloe, and one Prance, whom he had accused of being an accomplice in the murder, and who, after many promises and threats, finally confessed his guilt. Further prosecutions took place in the following year, when several persons were executed, and a new plot, called the *meal tub plot*, from the place where the papers relating to it were found, was got up by one Dangerfield, a convicted felon. In 1680, viscount Stafford was impeached by the commons, condemned by the lords, and executed December 29, as an accomplice in the plot, on the testimony of Oates and two of his associates, Bedloe having died not long before. This was the last instance of bloodshed in this strange affair. Soon after the accession of James II. (1685), Oates was tried and convicted on two indictments for perjury, and was sentenced to be whipped, on two different days, from Aldgate to Newgate, and from thence to Tyburn, to be imprisoned for life, and pilloried five times every year. See Hume's and Lingard's *History of England*.

POPLAR (*populus*); a genus of plants belonging to the *amentaceæ* and to the *diœcia octandria* of Linnæus. The species are trees often of large dimensions, having their buds usually covered with an aromatic and viscous substance; their flowers disposed in aments, and always appearing before the development of the leaves; and these last alternate, rounded or triangular, serrate or dentate, and supported on long petioles, which are more or less compressed, particularly towards their summits. This conformation occasions a peculiar vibratory motion in the leaves when they are acted upon by the wind, especially remarkable in certain species called *aspens*, which appear to be perpetually agitated. About twenty species are known, all confined to the northern and temperate regions of the globe. They are soft-wooded trees, of rapid growth. See *Tulip Tree*.

POPOCATAPETL; a volcano in Mexico, in the province of Puebla; lon. 98° 33′ W.; lat. 18° 36′ N. This volcano is constantly in action, throwing out smoke, ashes and fire, but no great eruption has hitherto taken place. Its figure is that of a truncated cone, with a large crater. It is 17,716 feet high, and is one of the highest mountains between the bay of Panama and Beering's straits.

POPPY (*papaver*). The species of poppy are herbaceous plants, all bearing large, brilliant, but fugacious flowers. One of them yields the opium of commerce, and the juice of all is lactescent. Most of the species are natives of Europe, often occurring as weeds in fields and waste places; but, in America, they are only seen in gardens, cultivated for ornament. One, indeed, the *papaver nudicaule*, is found in all the extreme northern regions of the globe. Their roots are annual or perennial; the leaves alternate, and the flowers terminal and drooping until they are expanded; the calyx is composed of two leaves, and the corolla of four petals; the stamens are very numerous, and the capsule is one-celled, but is divided internally by several longitudinal partitions, and contains a multitude of seeds.

POPULATION, Policy of. It was formerly a maxim in politics, that a country could not be overpeopled, since it was supposed that the means of subsistence increased in proportion to the increase of population. Industry would thus find sufficient means of support, partly by increasing the produce of the earth, partly by procuring more from foreign countries, so that the great population of a country could never be the cause of its falling into want and misery, provided it consisted of productive labourers. On this account, some have even made population the first principle of policy, and recommended all measures by which its increase could be promoted. This system also taught that artificial means should be employed to aid the increase of population; and, as it was considered desirable that all births should take place in matrimony, so that the children should always be provided with natural guardians, it became an object to furnish motives for the encouragement of matrimony. The Romans passed several laws for this purpose, and endeavoured to render a life of celibacy disgraceful: thus, for instance, he who had the most legitimate children, had the preference before all the other candidates for public offices. Whoever had three children was exempt from all personal taxes; free-born women who had three, and freed women who had four children, were released from the continual guardianship to which they were otherwise subjected: unmarried females, at the age of forty-five, were not allowed to wear jewels, or to use a litter, &c. Louis XIV. gave pensions to those who had ten or more children, and in other countries we find similar ordinances. The impolicy and injustice of these measures could not escape observation: others, therefore, rejected the principle of population, and maintained, on the contrary, that the policy of states should be to check the increase of population.

No one has laboured more to carry to its greatest extent the principle of population than Sonnenfels (in his Science of Politics and Finance, and in the Manual of the internal Administration of the State, in German): but Malthus has opposed this system, and endeavoured to lay the foundation of an opposite doctrine (in his Essay on Population, 3d ed., London, 1806). Malthus concludes that no more individuals can subsist in any country than the produce of human industry in that country is able to support. If, now, it can be proved that, in all countries, with a tolerably good government, the increase of population, as soon as it has arrived at a certain degree, is in a far greater proportion than the means of subsistence necessary for the support of the inhabitants, then it is evident that there will be a great scarcity, which will augment every year, as the disproportion between the population and the means of subsistence increases. For, if the population has already become so numerous, that only the greatest efforts of the nation are able to provide it with the necessary means of subsistence, then the increase of the following year cannot be provided with the necessaries of life without withdrawing them from the already existing population. He further asserts that all civilized countries are either at the point, or more or less near it, where as much food is produced from the soil as in any possible way can be obtained from it; and suppose more could be gained by greater efforts and more industry, it will never be in such proportion as the yearly increase of the population; and thus want and misery are approaching in all civilized countries, against which there is no other remedy than that the government either check the increase of population, or remove from the country the yearly arising surplus by means of colonies, and other measures conformable to this purpose. If some consider the introduction of inoculation for the small-pox, the diminution of the plague and of other epidemic diseases, as great benefits for the human race, we ought rather to regard them, according to the system of Malthus, as great evils, which only increase the want and misery of men by the famine which they inevitably produce. A careful examination will show that population may be the object of state policy, but that the promotion of this object must be regulated by a reference to other more important considerations.

Many of the premises, and of course the conclusions, of Malthus are either entirely false, or true only with great limitations. For, 1. although it is abstractly true, that the instinct of propagation in men, if no impediments were put in its way, would increase the population in a geometrical progression, so that a single couple, in the course of a few centuries, would people the whole earth; yet we no where find any excess of population, and the earth has hitherto always been able to receive an almost innumerable accession of inhabitants. Nature herself has provided a thousand ways to prevent the increase of the human race beyond the means necessary for its subsistence. She presents to man the means of subsistence with a sparing hand; she has made each generation dependent upon the love of parents, and planted in man a moral sentiment which forbids him to produce children before he is able to supply their wants. The cultivation of this sentiment in a nation is the great rule to be observed in respect to population. If the government can sufficiently extend and strengthen this sentiment, it needs do but little more for the regulation of population; for then marriages will not be contracted without the means of providing for children, and parents will endeavour so to educate their children as to qualify them to earn their own support. Those who wish to marry, and have no prospect of support in the country of their residence, will emigrate. The instinct of propagation, is thus checked, physically and morally, of itself, so that it cannot be against the intention of nature to keep the human race within prescribed limits. Sismondi gives, as an instance to illustrate this, the example of the family of Montmorency, which, if the natural instinct had been allowed to act freely, would have peopled the whole French empire; and yet nothing approaching to this result has taken place, although no individual of this family has been destitute of the necessary means of life. Other considerations have restrained the operations of this instinct, so that there are but a small number of individuals of this name existing in France.

2. That the artificial increase of food in any country cannot keep pace with the yearly increasing population, is an assertion also contradicted by experience, since, in fact, the increase of population rather accommodates itself to the means of subsistence, than the supply to the population. Where industry, assisted by nature, produces with ease whatever the wants of a numerous family require,

there population increases the most rapidly, if other regulations of society do not prevent. And if the greater number are employed in cultivating the soil, and few idle and unproductive consumers are to be found, then the population increases in an extraordinary manner. In such countries, it doubles, according to Euler, every twelve or thirteen years. The greatest increase of population which is known, on a large scale, is in the United States of North America, where, hitherto, it has doubled every twenty-five years. And even after all the good land has been brought into cultivation, the rapid increase will continue a long time; for the division of labour will furnish subsistence to a great number who do not wish to occupy themselves with the cultivation of the land; for experience teaches us, that a family which has no other occupation than the cultivation of the land is able, with a capital and industry, to produce enough for four or five families besides itself. Since these families which are occupied in the cultivation of the land are provided with manufactured articles, and are able to dispose of their own produce, an opulent population will arise, abundantly provided with the comforts of life. We may add that, even in the most cultivated part of the world (namely, in Europe), there is no extensive country without a quantity of uncultivated land (in England alone seven million acres), and which want nothing but hands, and the removal of political impediments, to supply the means of subsistence to a much greater number of inhabitants. It is impossible, moreover, to determine how much the means of support can be increased by a more perfect cultivation of the soil, by the discovery and introduction of more nutritious kinds of vegetables, &c., since experience shows that land which formerly hardly yielded four times the amount of the seed, now yields, under a more perfect cultivation, ten or twenty times; and what cannot be done by machines and chemical arts, if necessity and the desire of gain excite the genius of men to new inventions?

Finally, the increase of population may find a supply from the cultivation of countries not yet sufficiently peopled to consume their own natural productions. Such countries are always ready to exchange their surplus produce for the manufactures of those countries which are in want of it, since they cannot manufacture so cheap and so well, but can supply the produce of the soil much cheaper than it can be raised in manufacturing countries. This exchange is advantageous for both nations; and we find that even those nations which could easily produce more (and there is no country where this could not be done) leave a portion of the land uncultivated, or do not cultivate it as much as they might, because the produce thus obtained would be much dearer to them than that which they receive from other countries. As long as there are countries where food can be raised cheaper than in others, and as long as it can be bought cheaper, including the cost of transportation, than it can be cultivated in a given country, the population of this latter country will always be enabled to increase, provided it can produce superfluous manufactures which the former will receive for the surplus produce of the soil.

If we consider the many uncultivated spots which are capable of affording subsistence to innumerable millions of men, and which are still to be found in the midst of cultivated countries, then the policy which recommends checks to the increase of population, from fear of an inadequate supply, must appear very absurd. But, with regard to an excess of population in particular parts of the earth, it appears the dictate of a sound policy, 1. not to favour nor tolerate any institution in the country whereby useless, idle people are maintained. Therefore beggars and other vagabonds should never be protected in a state, and sinecures and superfluous offices should not be allowed. Every one ought to gain his subsistence by some employment useful to society. If all those produce who are able, they will easily provide for those who are employed in public offices, &c.; and with every generation as many productive individuals will arise as will be necessary to furnish supplies for those whose services they require. 2. To give a free scope to industry, and to useful labour of all kinds, and to make them the chief principle of the division of goods. It is contrary to this principle, if money, and particularly land, is kept united in great masses, in few hands, by means of associations, and if the access to them is rendered difficult, or is denied to industry, so that it cannot obtain what a free competition would have given it. Such institutions operate directly against the production of the country, and consequently against the population, as well as the distribution of wealth. But where the property is distributed according to the industry of each individual, the increase of the national wealth and its general distribution are best promoted, and the increase of population always follows the increase of the means of subsistence in a just proportion. 3. To give no occasion to capitalists or traders to transfer their capitals or their business to another country, as long as their own offers them equal advantages. 4. To give full liberty to those who wish to emigrate. Where such a policy is adopted, the natural instinct may be permitted to act freely, without fear of an excess of population. On the contrary, all artificial measures, which governments have often employed to increase the population, ought to be entirely rejected, because they do not also supply the means of preserving and educating the children. Since, further, the institution of matrimony is a religious and moral institution, which promotes, in the safest way, the moral purpose of the sexual appetite, a community ought to prevent, as much as possible, the birth of illegitimate children. No one should enter into matrimony without the prospect of being able to educate his children in such a manner that they shall also be able to provide for themselves, and afterwards for their children. Hence it follows that population, abstractly considered, is not an important subject of public policy, and that we ought not to fear, in the common course of affairs, an excess of population in civilized countries.

PORCELAIN. The Chinese porcelain excels other kinds of ware in the delicacy of its texture, and the partial transparency which it exhibits when held against the light. It has been long known and manufactured by the Chinese, but has never been successfully imitated in Europe until within the last century. See the article *China-ware*.

PORCIA; daughter of Cato of Utica, and wife of Brutus, celebrated as a model of connubial love and heroic patriotism. She preserved inviolate the secret of the conspiracy against Cæsar, with which she had been intrusted by her husband, and put herself to death when she saw the cause of the republicans lost. The story of her swallowing live coals is not true.

PORCUPINE (*hystrix*); a genus of quadrupeds belonging to the *rodentia*, or gnawers, characterized by having the clavicles imperfect, two incisor teeth in each jaw, and four molars both above and below, on each side; these have flat crowns, surrounded by a line of enamel, which enters into both edges, and appears to divide the tooth into two portions; there are also small lines of enamel radiating from the centre, which are worn down by attrition; the muzzle is thick and truncated; the lip divided; the tongue furnished with spiny scales; the ears short and rounded; the anterior feet furnished with four toes, and the posterior with five, all armed with thick nails. Cuvier divides this genus into *hystrix*, *athetura*, *eretizon*, and *synethera;* the first including the common porcupine; the second, the fasciculated porcupine; the third, the Canadian porcupine; and the fourth, the porcupine with a prehensile tail.

The common porcupine (*H. cristata*) is found in the southern parts of Europe and in Barbary. When full grown, it measures nearly two feet in length, and some of its spines exceed a foot. Its general colour is a grizzled, dusky black. The upper part of its head and neck is furnished with long, light coloured hairs, capable of being raised or depressed at pleasure; most parts of the back and sides are armed with spines, which are longest on the centre of the back. In their usual position they lie nearly flat upon the body, with their points directed backwards; but when the animal is excited, they are capable of being raised. The common porcupine, though known from the earliest ages, has given rise to numberless fables, among which that most commonly received is, that it possesses the power of ejecting its quills to a considerable distance when irritated or pursued. The use of this armature does not appear to be well understood; the most probable supposition, however, is, that, like that of the hedgehog, it is merely for defence, as, like that animal, it has the power of rolling itself up in a ball, and thus presenting a phalanx of spears on every side, that renders the attack of most animals fruitless. The porcupine generally sleeps during the day, and only leaves its burrow in the evening, in search of its food, which is almost entirely composed of vegetables. In captivity it is quiet and peaceable, but shows no marks of attachment or familiarity.

Canada porcupine (*H. dorsata*) is a very unsightly and sluggish animal, and is not provided with the long quills so remarkable in the last-mentioned species, its armature consisting of short, sharp spines, almost concealed by the hair with which they are intermingled. It is about two feet long, of a brownish colour mingled with white; the spines are attached in a very slight manner to the animal, and, from being barbed at tip with numerous small reversed points or prickles, they, by degrees, penetrate very deeply into the flesh after having once pierced it. Small and insignificant as these defensive weapons may appear, they are capable of causing the death of dogs, wolves, or indeed of any animal that incautiously attempts to seize the porcupine. These spines or quills are much used among the Indians to ornament different articles of dress: they dye them of various colours, in a very permanent manner. The Canada porcupine is principally found in the northern parts of the United States and in Canada. They feed on the barks of various trees, apples, corn, &c. Their flesh is said to be very unpalatable, resembling flabby pork. They pair about the latter end of September, and the female brings forth two young in April or May.

PORDENONE (so called from his birth-place, his true name being Giovanni Antonio Licinio), or Regillo da Pordenone, a painter of the Venetian school, and rival of Titian, was born in 1584, and executed many works for his native place; some also for Mantua, Vicenza, Genoa; but his greatest works for Venice. For this city he painted the chapel of St Roch, and the hall of the Pregadi, in conjunction with Titian, with whom he also painted in St John's church, whence a constant rivalry existed between them. He died in Ferrara, whither he had been invited by the duke Ercole II., to prepare cartoons for Flemish tapestry (*arazzi.*) His death was attributed to poison. He is distinguished for bold and lively colouring.

POROSITY, an essential property of bodies, is best ascertained by the microscope, which shows us the passage of fluids through solid bodies; or we may discover this property in the transmission of light, in all directions, through the internal structure of hard and solid bodies. The porosity of wood is very remarkable. Air may be blown, by the mouth, in a profuse stream, through a cylinder two feet long of dried oak, beech, elm, or birch; and if a piece of wood, or a piece of marble, be dipped in water, and submitted to experiment under the receiver of a pneumatic machine, the air issuing through the exterior cavities will appear in a torrent of bubbles on the external surface. In like manner mercury is forced through a piece of dry wood, and made to fall in the form of a fine divided shower. If a few ounces be tied in a bag of sheep skin, it may be squeezed through the leather by the pressure of the hand, in numerous minute streamlets. This experiment illustrates the porosity of the human cuticle. From microscopic observations, it has been computed that the skin is perforated by a thousand holes in the length of an inch. If we estimate the whole surface of the body of a middle-sized man to be sixteen square feet, it must contain no fewer than 2,304,000 pores. These pores are the mouths of so many excretory vessels, which perform that important function in the animal economy, *insensible perspiration*. The lungs discharge, every minute, six grains, and the surface of the skin from three to twenty grains, the average over the whole body being fifteen grains of lymph, consisting of water, with a very minute admixture of salt, acetic acid, and a trace of iron. If we suppose this perspirable matter to consist of globules only ten times smaller than the red particles of blood, or about the 5000th part of an inch in diameter, it would require a succession of 400 of them to issue from each orifice every second. The permeability of a solid body to any fluid, depends, however, on its peculiar structure and its relation to the fluid. A compact substance will sometimes oppose the entrance of thin fluid, while it gives free passage to a gross one. Thus a cask, which holds water, will permit oil to ooze through it; and a fresh, humid bladder, which is air-tight, will yet, when pressed under water, imbibe much of that liquid. If a cylindrical piece of oak, ash, elm, or other hard wood, cut in the direction of its fibres, be cemented to the end of a long glass tube, water will pass freely through it, in divided streamlets; but a soft cork, inserted into a similar tube, will effectually prevent all escape of the liquid Mercury may be carried in a small cambric bag, which could not retain water for a moment. If a circular bottom of close-grained wood, divided by a fine slit (from the 30th to the 100th part of an inch wide), be cemented to the end of a glass tube, it will support a column of mercury from one to three or more inches high, the elevation being always proportional to the narrowness of the slit. Hence a cistern of box-wood is frequently used for portable barometers, the fine joints admitting the access and pressure of the air, but preventing the escape of the mercury. Yet a sufficient force would overcome this obstruction; and, in the same manner, the air which is confined in the common bellows under a moderate pressure, might, by a more violent action, be made to transpire copiously through the boards and the leather.

The transmission of a fluid through a solid substance shows the existence of pores; but the resistance, in ordinary cases, to such a passage, is insufficient, therefore, to prove the contrary. The permeability of translucent substances to the rays of light, in all directions, evinces the most extreme porosity. But this inference is not confined merely to the bodies usually termed *diaphanous;* for the gradation towards opacity advances by insensible shades. The thin air itself is not perfectly translucid, nor will the densest metal absolutely bar all passage of light. The whole mass of our atmosphere, equal to the weight of a column of thirty-four feet of water, transmits, according to its comparative clearness, only from four-fifths to three-fourths of the perpendicular light, and consequently retains or absorbs from a fifth to a fourth of the whole. But this absorption is greatly increased by the accumulation of the medium. When the sun has approached within a degree of the horizon, and his rays now traverse a tract of air equal in weight to a column of 905 feet of water, only the 212th part of them can reach the surface of the earth. Even gold itself is diaphanous: if a leaf of that metal, either pure or with only an 80th part of alloy, and therefore of a fine yellow lustre, but scarcely exceeding the 300,000th part of an inch in thickness, and enclosed between two thin plates of mica, be held immediately before the eye, and opposite to a window, it will transmit a soft green light, like the colour of the water of the sea, or of a clear lake of moderate depth. The inferior ductility of the other metals will not allow that fine lamination, which would be requisite for showing, in ordinary cases, the transmission of light. But their diaphanous quality might be inferred from the tints with which they affect the transmitted rays, on being alloyed with gold.

Other substances, though commonly reckoned opaque, yet admit, in various degrees, the passage of light. The window of a small apartment being closed by a deal board, if a person within shut his eyes a few minutes to render them more acute, he will, on opening them again, easily discern a faint glimmer issuing through the window. In proportion as the board is planed thinner, more light will be admitted, till the furniture of the room becomes visible. Writing paper transmits about a third part of the whole incident light, and, when oiled, it often supplies the place of glass in the common workshops. The addition of oil does not, however, materially augment the diaphanous quality of the paper, but renders its internal structure more regular, and more assimilated to that of a liquid. The rays of light travel, without much obstruction, across several folds of paper, and even escape copiously through pasteboard. Combining these various facts, it follows that all bodies are permeable, though in extremely different degrees, to the afflux of light. They must, therefore, be widely perforated, and in every possible direction.

PORPHYRY is a compound rock, having a basis in which the other contemporaneous constituent parts are imbedded. The base is sometimes claystone, sometimes hornstone, sometimes compact feldspar, jade, pitchstone, pearlstone, and obsidian. The imbedded parts are commonly feldspar and quartz; the former in more or less distinct crystals. There are porphyries of different ages. One variety is found graduating into granite and gneiss; but it does not possess the characteristics of the rock in the highest perfection; another is found in overlying strata, and unconformable to other rocks, which is the true porphyry. Its colour is often red or green, and, when polished, is valuable for ornamental work, being superior to marble, on account of its great hardness. This rock abounds in Egypt, the northern parts of Europe, in Mexico and South America. There is still another variety found in connexion with extinct volcanoes, which is sometimes distinguished by the name of *clay-porphyry.* It abounds in the neighbourhood of the Mediterranean.

PORPHYRY; a celebrated philosopher, of the school of the New Platonists. See *New Platonists.*

PORPOISE (*delphinus phocæna*). Several species of the genus *delphinus* are known by seamen under the name of porpoise, but the *D. phocæna* is that to which this designation is generally applied. The term *porpoise, porpesse,* or *porpus,* is derived from the Italian *porcopesce,* or hog-fish, from the supposed resemblance of its projecting snout to that of the hog; the French and German appellations for it have a similar signification. The porpoise is distinguished from the dolphin by the superior thickness of its head and its smaller size. The back is generally black, and the belly white. Both jaws are furnished with teeth; these are compressed, sharp, black above and white beneath. The spout-hole is upon the crown of the head, of a semilunar shape, and divided internally by a cartilaginous membrane. The whole body is covered with a coat of fat, nearly an inch in thickness, beneath which the flesh appears red and muscular, resembling that of the hog. They are very abundant on the American coast, and, before a storm, may be seen gambolling and *tumbling,* as it is termed, in large shoals. The porpoise feeds on small fish, such as the herring and mackerel, of which they destroy great numbers. It is said that they act in concert, when in pursuit of their prey, urging them from one bay or estuary to another, deterring them from the shallow water, and driving them towards each other's ambush, with all the art of an experienced dog. The flesh was formerly considered as a great delicacy, but is now seldom eaten; the liver, however, is still esteemed by seamen, and is said to resemble that of the hog in taste.

PORPORA, NICOLO (called, by the Italians, the *patriarch of harmony*), was born at Naples in 1685. His first opera, *Ariana e Teseo,* was brought out at Vienna (1717). The operas which he composed for Rome, Naples and Venice, before and after his visit to England, amount, according to doctor Burney, to more than fifty. In 1730, several cantatas by him were also published. In 1726, he brought forward his *Siface,* at Venice, at the same time that Vinci had his *Siroe* performed on another stage in the same city. At first he found it difficult to sustain the contest, but, up to 1729, he had brought out five operas at Venice, which were received with general applause. In that year he went to Dresden, where the king of Poland appointed him his chapel-master. He was treated with the greatest distinction at court, and Hasse (q. v.) and his wife could not conceal their jealousy of Porpora and the celebrated Mingotti (q. v.), whom he had instructed. In 1731, Porpora returned to Naples, and established a singing school, which produced the greatest singers of the eighteenth century, Farinelli, Caffarelli (see *Majorano*), Salimberti, Uberti, Gabrielli, &c. In 1732, he went with Farinelli to London, whither he had been invited on account of the disputes between Handel (q. v.) and the directors of the opera. His twelve cantatas for a single voice procured him this invitation. But his theatre sustained itself only while supported by Handel's adversaries, and, in 1736, it entirely fell through. He had exhibited only four operas in London. During his stay there, he published six trios for two violins and a bass-viol (*Sei Sinfonie di Camera*), which show that he excelled much less in instrumental than in vocal music. He appears, however, to have been sensible of his defects; he studied the sonatas of Corelli, and, in 1754, published twelve sonatas for the violin, which belong to the first class in this department. At about the same, he visited Germany again, and taught singing in Vienna. Haydn (q. v.), who was then emerging from poverty, accompanied him on the harpsichord, and was in his service for three months. Porpora produced masterpieces for the church, the chamber, and the theatre. Selvaggi made a complete collection of such of his works as were at Rome: there are many others at Naples. The prevailing character of his music is serious and elevated. In the recitative he was considered, by all composers, as a model. After having been, a long time, first teacher of the *conservatorio degli incurabili* at Venice, where he composed many admirable masses and motets, he returned to Naples, where he died in 1767 in the greatest poverty.

PORSENNA, the king of the Etrurian city Clusium, received the Tarquins when they fled from Rome, and, after in vain endeavouring to effect their restoration by negotiation, advanced with an army to Rome. He would have entered the city with the flying Romans, had not Horatius Cocles disputed the passage until the bridge was broken down. Porsenna then besieged Rome, and a famine was produced in the city, when another Roman youth, Mucius Scævola gave a striking proof of his patriotism and devotedness. Porsenna was now inclined to negotiation. He demanded that their property should be restored to the Tarquins, and that the cities taken from the Veientes, in former wars, should be given up. The second condition was granted; the first was rejected. A truce, however, was agreed upon, for the security of which the Romans sent ten young men, and as many girls, as hostages, to the Etrurian camp. The latter found an opportunity of escaping to Rome, by swimming over the Tiber. But the consul Publicola conveyed them back again to Porsenna, and was, on this occasion, treated with the greatest indignity by the Tarquins. Porsenna, on receiving intelligence of it, immediately despatched his son Aruns, to protect the Romans. Indignant at the perfidy of the Tarquins, and respecting the magnanimity of the Romans, the king separated himself from the former, and concluded peace with the latter without taking away their hostages. To relieve the wants of the Romans, without offending their pride by a formal present, he left behind, at his departure, his whole camp, with all its stores. In remembrance of his magnanimity, the senate erected to him a monument, and presented him with an ivory chair and sceptre, a golden crown, and a royal robe. A subsequent proposition from Porsenna to the Romans to admit the Tarquins being declined, Porsenna abandoned them, lived in undisturbed friendship with the Romans, and restored to them the territory of the Veientes, which they had ceded at the conclusion of peace.

PORSON, RICHARD; a celebrated critic and classical scholar, professor of Greek in the university of Cambridge. He was born Dec. 25, 1759, at East Ruston, in Norfolk, where his father was clerk of the parish, and to him he was indebted for the first rudiments of his education. He received some further instruction at the village school, and also from the vicar of Ruston; after which he was sent to Eton, through the patronage of some gentlemen who witnessed and admired his early proficiency and inclination for the study of classical literature. In 1777, he became a student of Trinity college, Cambridge, where he gained a prize medal; and, in 1781, he was chosen to a fellowship. He proceeded M.A. in 1785; and, not choosing to take holy orders, on account of conscientious scruples in regard to the signing of the Thirty-nine Articles, he was obliged to relinquish his fellowship. In 1793, he was unanimously elected Greek professor, and, two years after, he began the publication of the Tragedies of Euripides, with annotations, but continued his labours only through four of these dramas—Hecuba, Orestes, Phœnissæ, and Medea. He also assisted in editing the Grenville Homer, published at Oxford (1800, 4 vols., 4to), and corrected the text of the tragedies of Æschylus for a splendid edition, which appeared from the Glasgow press, in folio, also printed in two volumes octavo. He enjoyed the reputation of being one of the best Greek scholars and critics of the age in England, notwithstanding which, he experienced little patronage—a circumstance partly attributable to his intemperate habits. Towards the latter part of his life, he was appointed librarian to the London institution, with a salary of £200 a year; and his death took place Sept. 25, 1808, at his apartments, in the house then belonging to that establishment in the Old Jewry. His decease was occasioned by apoplexy; and, his body having been subjected to anatomical examination, it was discovered that his skull was one of the thickest that had ever been observed. He was the author of Letters to Archdeacon Travis, in Answer to his Defence of the Three Heavenly Witnesses (1790, 8vo), in which he is allowed to have completely invalidated the contested text, 1 John v. 7; and, after his death, professor Monk and Mr Blomfield, now bishop of London, published his Adversaria, or Notes and Emendations of the Greek poets; and his Tracts and Miscellanies were edited by Mr Kidd (1815). Many of these are sallies of irony and humour of the most racy and peculiar kind, which, with other articles abounding with learning and critical acumen, appeared in various of the literary journals. Acuteness of discernment, solidity of judgment, united to intense application and a stupendous memory, rendered professor Porson a complete critic in the most honourable sense of that appellation. He married Mrs Leman, sister to Mr Perry, proprietor of the Morning Chronicle, in which many of his fugitive pieces appeared.

PORT. The name of *Port wines*, or *Oporto wines*, is given, in commerce, to the produce of the vineyards along the course of the Douro, in Portugal. Although there are, in reality, many varieties of wines produced in this district, yet such is the degree to which the manipulations, admixtures and adulterations of these wines have been carried, that Port wine has come to be considered as a peculiar species of liquor, of nearly uniform flavour and strength, varying, indeed, in quality, but admitting few degrees of excellence; whereas the liquor sold under this name is, in fact, a compound of a great number of wines of very different quality, with a large admixture of brandy. The wine country of the Upper Douro begins at about fifty miles from Oporto, and is under the superintendence of a company vested with great privileges. The better wines, under the name of *factory* wines, are destined for exportation; those designed for the English market are called *vinhos de embarque* or *export* wines, and those for other countries *vinhos separados*, or *assorted* wines. The wine is first placed in large tuns, in which it remains till winter, when it is racked into pipes, and conveyed to Oporto. To that intended for exportation, brandy is added when it is deposited in the stores, and an additional quantity when it is shipped, generally about a year after the vintage. It is then of a dark purple colour, a full body, with an astringent bitter-sweet taste, and a strong flavour and odour of brandy. After remaining some years in the wood, the sweetness, roughness, and astringency of the flavour, abate; but it is not until it has been kept ten or fifteen years in bottle that the odour of the brandy is subdued, and the genuine aroma of the wine is developed. When a very large portion of the extractive and colouring matter is precipitated in the form of a crust, the wine becomes tawny, and loses its flavour and aroma. This is very apt to be the case in the wines made from white grapes, and coloured with elder berries or other materials—a common practice when there is a deficiency of the black grapes. Port wines of excellent quality are often so highly adulterated with brandy as to be entirely deprived of their flavour and aroma; and the stronger kinds, which are not irretrievably ruined by this admixture, only regain their flavour after being allowed to mellow for many years. Port wine (if the liquor thus described may be so called) was introduced into very general use in Britain by the Methuen treaty (1703), and the frequent and protracted hostilities between Britain and France kept it in vogue till the peace of 1815, since which the taste for light wines has been revived there, so as materially to lessen the consumption of the strong wines of Portugal. The Port wines, abounding in the astrigent principle, and deriving additional potency from brandy, may be serviceable in disorders in which gentle tonics are required; but gallic acid renders them unfit for weak stomachs, and the excitement they produce is of rather a sluggish nature.—See *Wines;* see, also, Henderson, on wines (London, 1824.)

PORT; a harbour or haven on the sea-coast.

Free Port is one open and free for merchants of all nations to load and unload their vessels in, without paying any duty or customs; such are the ports of Genoa and Leghorn.

Free Port is also used for a total exemption and franchise which any set of merchants enjoy, for goods imported into a state, or those of the growth of the country exported by them.

PORT is also a name given, on some occasions, to the larboard or left side of the ship, as *Port the helm*—the order to put the helm over to the larboard side of the vessel, when going large. This word appears intended to prevent any mistakes happening from the similarity of sounds in the words *starboard* and *larboard*, particularly when orders are given relating to the helm.

PORT, or PORT HOLE. The embrasures or openings in the side of a ship of war, wherein the artillery is ranged in battery upon the decks, above and below, are called *ports*, or *port holes*.

Gun-room ports are situated in the ship's counter, and are used for stern chases, and also for passing a small cable or a hawser out, either to moor, head and stern, or to spring upon the cable, &c.

Lower-deck ports are those on the lowest gun-deck

Middle-deck ports are those on the second or middle gun deck of three-deckers. The port holes are shut up in storms, to prevent the water from driving through them.

Port lids; a sort of hanging doors, to shut in the ports at sea. They are fastened by hinges to the upper edges of the ports, so as to let down when the cannon are drawn into the ship, whereby the water is prevented entering the lower decks.

Port hooks; hooks over the ports, to which the port hinges are attached.

PORT-AU-PRINCE. See *Port Républicain*

PORT JACKSON. See *New South Wales*, and *Sydney*.

PORT MAHON. See *Mahon*.

PORT REPUBLICAIN; formerly *Port-au-Prince*, capital of the republic of Hayti, on the western side of the island, at the south-east extremity of the bay of the same name; lat. 18° 33′ N.; lon. 72° 27′ W. It is built in a low and unhealthy spot, with broad but unpaved streets, and contains the president's palace, several literary institutions, a lazaretto, and other public buildings. Besides the military school, the pupils of which are instructed gratuitously, there are several monitorial schools. Commerce is the principal occupation of the inhabitants. In 1824, 131 American, 18 English, 6 German, and 33 French vessels entered the port, and the value of the imports amounted to 16,500,000 francs. The amount of exports—coffee, cotton, Campeachy wood, &c.—was much greater. The population, which, in 1790, was 15,000 (of whom 12,000 were blacks), is now estimated at 30,000. The city was founded in 1745, and was completely destroyed by an earthquake in 1770. In 1830, it experienced several shocks, some of which did considerable damage.

PORT ROYAL; a seaport of the island of Jamaica. (q. v.)

PORT ROYAL DES CHAMPS; a cistercian convent, founded in 1233, not far from Versailles, and about six leagues from Paris, played an important part in the Jansenistic controversy. (See *Arnauld* and *Jansenius*.) The abbess Angelica, sister of Antony Arnauld, had brought it into close connexion with the theologians of Paris by founding a new convent in the suburb of St Jacques in Paris (1626), which, in distinction from the parent establishment, was called *Port Royal de Paris*. She had also revived the monastic austerity in the two houses. The nuns of Port Royal adhered, under the influence of their protector, Jean de Vergier du Havranne, abbot of St Cyran, to the Jansenists, and their house in the country became the sanctuary of the party, when the most eloquent theologians and defenders of Jansenism—Nicole, the brothers Arnauld and Lemaitre—took up their residence at Port Royal des Champs, in a separate building, called *Les Granges*. Here they participated in the penances and labours of the nuns, and set up a school, in which, in opposition to the lax system of the Jesuits, they inculcated a purer morality, and aimed at a more thorough course of study, with useful improvements in the method of instruction. The celebrated Anne of Bourbon, duchess of Longueville, came into the neighbourhood, and became their patroness; Boileau was their friend, and Racine their grateful pupil. The latter wrote a history of Port Royal. This society presented a union of great talents, profound learning and sincere piety, which has rarely been equalled: penitents of all conditions joined it, and the fame of its sanctity spread over the Catholic world. Trusting to their reputation, the nuns refused to subscribe the bull of Alexander VII. against the disputed doctrines of Jansenius, and sustained themselves, after their protectors had been expelled, through numerous humiliations, until the beginning of the eighteenth century, when their continued adherence to the Jansenist doctrines, which had gone out of vogue, resulted in the suppression and complete destruction of the abbey by the Paris police (1709.)

Its ruins still form a place of pilgrimage for the more devout Parisian, and Gregoire has erected a monument to its memory in his work entitled *Les Ruines de Port Royal* (1809.)

PORTAMENTO DI VOCE (Italian, *conduct of the voice*), in music, signifies the skill of the singer to connect one sound so closely with the others, that no interruption is perceptible, and that all seem to be but one long breathing. The art of the singer, in this respect, is to breathe at the proper time.

PORTCULLIS, in fortification, is an assemblage of several large pieces of wood, joined across one another like a harrow, and each pointed with iron at the bottom. They are sometimes hung over the gateway of old fortified towns, ready to be let down in case of surprise, when the gates cannot be shut.

PORTE, OTTOMAN, OR **SUBLIME PORTE**; the court of the Turkish sultan, so called from the gate (*porta* in Italian) of the imperial palace. See *Ottoman Empire*.

PORTER, SIR ROBERT KER, an eminent artist and traveller, was born at Durham. His mother was left a widow with five children, and in scanty circumstances. Robert early manifested an uncommon genius for drawing, many of his sketches, made when he was only six years of age, being remarkable for their spirit; and, in 1790, he became a student at the royal academy, under the auspices of Mr West. Not more than two years had elapsed, since his commencing his studies at the academy, when he was employed to paint the figures of Moses and Aaron, for the communion-table of Shoreditch church. In 1794, he presented to the Roman Catholic chapel, at Portsea, an altar-piece representing Christ calming the storm; and, in 1798, he gave to St John's college, Cambridge, an altar-piece, the subject of which is St John preaching in the wilderness. He was only twenty-two when he began his large picture of the storming of Seringapatam. Though it contained nearly seven hundred figures as large as life, it was finished in ten weeks; nor did it bear any marks of haste, it being, both in composition and colouring, a work of high merit. It was succeeded by two other pictures of the same magnitude—the Siege of Acre, and the Battle of Agincourt. In 1804, he was invited to Russia by the emperor, who made him his historical painter. He consequently visited St Petersburg, where he was received with distinction, and employed to decorate the admiralty hall, in the Russian capital. While residing there, he gained the affections of the princess Scherbatoff, and was on the point of marrying her, when a rupture with Britain obliged him to leave Russia. He passed into Sweden to join the British forces under Sir John Moore, whom he accompanied to Spain, sharing in the hardships and perils of the campaign, which ended with the battle of Corunna. After having remained for some time in Britain, he again went to Russia, and received the hand of the princess Scherbatoff. With her he revisited his native country, where, in 1813, he obtained the honour of knighthood. From 1817 to 1820 inclusive, he was engaged in travelling through the East; and, in the course of his travels, explored the countries from the banks of the Black sea to the Euphrates, and from the Euphrates to the mouth of the Persian gulf. Among his works are Travelling Sketches in Russia and Sweden (2 vols., 4to, 1808); Letters from Portugal and Spain (8vo, 1809); Narrative of the Campaign in Russia (1813); Travels in Georgia, Persia, and Armenia (1822.)

PORTER. See *Brewing*.

PORT-GLASGOW; a seaport town in Renfrewshire, situated on the southern banks of the Clyde, nineteen miles west from Glasgow. It was founded in 1668, the magistrates of Glasgow having, in that year, feued about eleven acres of land adjoining to the ancient village of Newark, for the purpose of forming a harbour for the accommodation of their shipping. This they called New Port-Glasgow. The place originally belonged to the parish of Kilmalcolm, but in 1695, it was erected into a distinct parish.

Port-Glasgow is built on a regular plan, the streets crossing each other at right angles. The houses are in general well constructed, and the streets are paved and lighted. The vicinity of the town is adorned with handsome villas and luxuriant gardens, behind which, to the south, stretches a range of high hills. The harbour is excellent, having extensive warehouses on the quay, and sheds for the protection of goods. In 1760, the first dry dock in Scotland was constructed here by the merchants of Glasgow, who sold it at a late period to the magistrates of the town. It is still in good preservation, and is productive of a considerable revenue. In 1791, there belonged to this port 125 vessels, whose united burden was 12,760 tons; but since that time the shipping seems to have decreased; for, from the returns of vessels belonging to the different British ports, published by order of Parliament in 1829, it appears that the ships of Port-Glasgow were but forty-six in number, and their total burden 6,807 tons. Since the deepening and widening of the Clyde at Glasgow, which of late years has been carried on so extensively, neither the shipping of Port-Glasgow, nor that of its rival port, Greenock, is likely to increase.

Port-Glasgow possesses a public coffee-house, council chamber, court-hall, prison and bridewell; a custom-house; a parish church, with several meeting-houses; public schools, public markets, and a theatre. The chief trade of the place consists in ship-building, sugar refining, and rope and sail making. It joins with Kilmarnock, Rutherglen, Dumbarton, and Renfrew in sending a member to parliament. Population of town and parish in 1821, 5,262; in 1831, 5,192.

PORTICI. See *Naples*, and *Herculaneum*.

PORTICO (Italian, from *porticus*, Lat.); a continued range of columns, covered at top, in order to serve as a shelter from the weather; also a common name for buildings which had such covered walks supported by pillars. Among the ancients, these were highly ornamented, and of great extent. The remains of the portico at Palmyra (q. v.) show it to have been full 4000 feet long. There was a famous portico at Athens, called *Pœcile*. (q. v.) Among modern porticoes, those of the grand *facade* of the Louvre and of the great court of the hospital of invalids at Paris, and that at Greenwich hospital, deserve mention.

PORTIUNCULA. See *Franciscans*.

PORTLAND. The Bentinck family is Dutch, the founder of it in England having been count Bentinck, created earl of Portland by William III.; his son was created duke by George the First. The grandson of the latter, William Henry Cavendish Bentinck, third duke, was born in 1738, and, after sitting for some time in the house of commons, was called to the upper house by the death of his father, in 1762, from which time he voted with the marquis of Rockingham (q. v.), in whose administration he was lord chamberlain. During the American war, he acted with the opposition, and, in 1782, was appointed lord lieutenant of Ireland, where he remained only three months, in consequence of the death of the marquis of Rockingham. From the accession of Pitt, the duke acted with the whig opposition until 1792, when he was elected chancellor of Oxford, and, joining with Mr Burke in his alarm at the French revolution, he supported administration. He was accordingly, in 1794, made secretary of state for the home department, which he held until the resignation of Mr Pitt, 1801, and was then appointed president of the council, which he held until 1805. On the resignation of Lord Grenville, in 1807, he was appointed first lord of the treasury, which office he resigned soon after, and died in 1808. The present duke of Portland (born in 1768) was lord privy seal in Canning's administration, and lord president of the council in that of Goderich.

PORTLAND; a post-town, port of entry and commercial metropolis of the state of Maine, North America. It stands on a peninsula in Casco bay, and has a beautiful and healthy situation, and one of the best harbours in America; north-north-east from Boston, 110 miles; from Washington, 542; population, in 1820, 8,581; in 1830, 12,601.

PORTLAND STONE is a dull, whitish species, much used in buildings about London. It is composed of a coarse grit cemented together by an earthy spar.

PORTLAND VASE (formerly called the *Barberini Vase*); one of the most beautiful relics of antiquity of the kind. It is a funeral vase, and was discovered near Rome, during the pontificate (1622—1644) of Urban VIII. (Barberini), in a sarcophagus, which is supposed to have been that of Alexander Severus and Julia Mammæa, his mother. It was bought of the Barberini family in 1786, by the late duke of Portland, for 1000 guineas. Its height is about ten inches, and its diameter, where broadest, six. There are several figures on it of exquisite workmanship, in basso relievo, in white opaque glass, on a ground of deep blue glass, which appears black, except when held against the light. Veltheim (*Hist. und Antiq. Abhandl.*, 1800) thinks that it represents the history of Alceste, who is restored to Admetus by Hercules, but that on the sarcophagus, which is still in the Vatican, is represented the quarrel of Achilles and Agamemnon about Briseis.—See Wedgwood's *Description of the Portland Vase* (London, 1790, 4to.)

PORTO. See *Oporto.*

PORTO-BELLO, (properly *Puerto Velo*); a harbour and city of New Grenada, on the isthmus of Panama, forty-five miles N. W. of the city of Panama. It is situated on the Caribbean sea, and has a large and safe harbour; lat. 90° 24′ N.; lon. 79° 43′ W. It was never very populous, even in its most flourishing period, and its population is now much reduced; we have no precise data relative to it. The Spanish galleons formerly came here annually to receive on board the rich exports of Peru and Chile, which were landed at Panama, and transported across the isthmus; but it was captured several times by the British; and, in 1740, its fortifications were destroyed by admiral Vernon, from which period the articles above-mentioned were carried round cape Horn. See *Panama, Isthmus of.*

PORTO-BELLO; a flourishing and handsome modern town in the parish of Duddingston, and county of Edinburgh, situated on the coast of the firth of Forth, about 2 miles east from the capital. Before 1740, it had no existence, its first house being a cottage built by a retired sailor, who had been with Admiral Vernon at the siege of Porto-Bello, (see above) and hence named the place. It is much frequented for sea-bathing. Population in 1831, 2781.

PORTO CABELLO, or PUERTO CABELLO; a town of Venezuela, on the Caribbean sea; lat. 10° 28′ N.; lon. 68° 17′ W. It is built partly on a small island, which communicates with the continent by a bridge. It has a capacious and safe harbour, and a population of less than 5,000.

PORTO SANTO. See *Madeira.*

PORT-PATRICK; a sea-port in Wigtonshire, Scotland, distant from Edinburgh, 133 miles; from Glasgow, eighty-nine. It lies on the shore of the Irish sea, and forms the nearest point of Great Britain to Ireland, the distance here between the two islands being only twenty-one miles. The town is most pleasantly situated, with an aspect open towards the south, and defended on the opposite quarter by a semi-circular range of hills. It is an excellent place for sea-bathing, and during the summer months, it attracts a great number of visiters. The harbour was formerly small and inconvenient, being a mere inlet between projecting ridges of rock; but there is now one of the best quays in the kingdom, with a reflecting lighthouse. Steam-boats, with the mail-bags and passengers, pass regularly between this port and Donaghadee, in Ireland; and mail-coaches are established from London and Edinburgh to Port-Patrick, and from Dublin to Donaghadee. Population of town and parish, in 1821, 1818; in 1831, 2239.

PORTS, Cinque. See *Cinque Ports*

PORTSEA; an island of Southamptonshire, England, extending from north to south about five miles, and from east to west about three. It comprises the borough and sea-port town of Portsmouth, the town of Portsea, and several villages. The land is flat and the soil in general fertile. The coasts of the island are defended by several detached forts and castles, the most important of which are Fort Cumberland, Southsea Castle, and Hillsea. See *Portsmouth.*

PORTSMOUTH; a noted seaport in the English channel, being the principal rendezvous of the British navy. It is situated on the western side of the island of Portsea, at the mouth of the bay termed *Portsmouth harbour*, 72 miles south-west of London, lon. 1° 6′ W.; lat. 50° 47′ N; and consists of the old town of Portsmouth, included within its fortified walls, and the new towns of Portsea and Southsea, which were only begun about a century ago, on commons to the north and south of the town, but have already out-grown in size, population and importance the parent town itself. Portsmouth harbour excels, decidedly, every other in Great Britain for its capaciousness, depth and security. At its entrance, the harbour is very narrow, but it soon expands to a great width. Every where the anchorage is good, the depth sufficient for ships of any size, the shelter complete, and the extent sufficient to contain almost the whole navy of Britain. The famous roadstead of Spithead, between Portsmouth and the Isle of Wight, can contain 1000 sail of vessels in the greatest security Portsmouth harbour is well protected from assaults by the number and strength of its batteries. The fortifications were begun by Edward IV. The dock-yard, being the grand naval arsenal of Britain and the general rendezvous of the British fleet, is by far the largest in the kingdom, including an area of 100 acres. In the naval college, the number of scholars is limited to 100 in time of war, and seventy in time of peace, of whom thirty, the sons of officers of the navy, are maintained and educated free of expense. On the anchor-wharf, hundreds of anchors are piled up ready for immediate service The ropery is three stories high, fifty-four feet broad, and 1094 feet long. In the vast building called the *smithery*, anchors are wrought weighing from seventy to ninety cwts. each. The gun-wharf is an immense arsenal, consisting of various ranges of buildings for the reception of naval and military stores, artillery, &c. The small armoury is capable of containing 25,000 stand of arms. Near Portsmouth is Haslar hospital for the navy. The church of Portsmouth is a spacious structure, dedicated to St Thomas a Becket. The tower, which is the most modern part, forms a good mark to seamen. There are various charitable, literary, and scientific institutions. The theatre is the principal source of amusement. The shore from Portsmouth to Southsea castle presents one of the finest bathing places in the kingdom. Portsmouth received its first charter from Richard Cœur de Lion. The earliest mention of this place occurs in the Saxon Chronicle, A. D. 501. Population of borough and parish of Portsmouth in 1831, 8083; of parish of Portsea, 42,306.

PORTSMOUTH, the largest town of New Hampshire, in the States of America, is a port of entry, and the only seaport in the state. It is situated on the south side of Piscataqua river, on a beautiful peninsula, three miles from the sea, fifty-six miles north by east from Boston, and 491 from Washington; population in 1810, 6934; in 1820, 7327; in 1830, 8082.

PORTUGAL; a kingdom in the south-western corner of Europe, on the western side of the Spanish peninsula, lying between latitude 36° 56′ and 42° 7′ N., and between longitude 7° 34′ and 9° 30′ W., with Spain on the north and east, and the Atlantic ocean on the south and west. It is nearly in the form of a parallelogram; its length from north to south is 350 miles; its average breadth, about 115; its superficial area, 41,580 square miles. The population was estimated by Balbi, in 1822, at 3,173,000; in 1826, it was stated at 3,214,000. The state is composed of the kingdom of Portugal, comprising the provinces Entre Minho e Douro, Tras os Montes, Beira, Estremadura, and Alen Tejo, and the kingdom of Algarve. In Asia, Portugal possesses the city of Goa Diu on the coasts of Cambay, a part of the island of Timor, and Macao, with a total population of 576,000; in Africa, the island of St Thomas and Prince's island on the coast of Guinea, the Azores, Cape Verd and Madeira islands in the north, some factories in Senegambia, a part of Angola and Benguela, and the captain-generalcy of Mozambique, with a total population of 1,057,000. In America, it retains nothing of its former immense possessions. (See *Brazil*.) The face of the country is, in general, mountainous, and has but two plains of considerable extent, that of Alen Tejo and that of Beira. The principal mountain ridges are merely spurs of the great Spanish system (see *Spain*), from which descend the largest rivers of Portugal, the Tejo, or Tagus, the Guadiana, the Douro (in Spanish, *Duero*) and the Minho. The valleys, particularly in Minho and Tras os Montes, are remarkable for beauty and fertility. Mineral springs abound. Although the country lies in the warmer portion of the temperate zone, the climate is by no means so hot as in the central and southern parts of Spain; the sea breezes temper the heat on the coasts, and the north winds refresh the interior. The air is remarkably mild and healthy. In January begins a most delightful spring; from March the weather is unsettled, sometimes dry and hot. The harvest is in June. From the end of July to the beginning of September, vegetation is parched by the glowing rays of the sun; and although the weather is, taking the year through, very favourable to cultivation, yet agriculture sometimes suffers from this drought. Artificial irrigation is little practised except in gardens. Rain rarely falls in summer; but, though the days are hot, the evenings and nights are cool. When the first rain falls in September, the earth is again covered with a fresh green, a second spring begins, and the fruit trees are decked anew with blossoms. The winter sets in towards the close of November, and is accompanied by violent showers of rain, which are not, however, of long continuance, but alternate with pleasant weather. In the northern part of the country only does the cold continue for any length of time; in the south, snow is a rare phenomenon. Thunder storms occur only in autumn and winter.

Portugal is rich in natural productions, but wants the cultivation of industrious hands. The climate and the fertility of the soil incline the Portuguese, like most other southern nations, to indolence; and they engage more readily in commerce than in agriculture or manufactures. The rich mines of precious metals are now neglected on account of the want of hands and fuel. The only mines worked are some of iron in Estremadura. Copper, iron, arsenic, bismuth, and fine marbles, are found in several provinces, but precious stones are rare. Salt-springs are not numerous; salt is chiefly obtained from sea-water. The corn trade is also less productive than formerly; for example, in the thirteenth century, when Portugal exported corn. The discoveries of new countries, and their consequences, emigration to the colonies, and increasing commerce, withdrew so many hands from agriculture, that this branch of national industry began to decline in the fifteenth century. In addition to these causes, the ignorance of the peasantry, the oppressions to which they were exposed, the wealth of the clergy, the deficiency of beasts of burden, and the absence of all facilities of transportation, contributed to the decline of agriculture; and notwithstanding the efforts of the government, since the administration of Pombal, to revive it, the importation of corn has continued to be necessary. The potato is not so much cultivated as the root of the less nourishing *helianthus tuberosus* (Jerusalem artichoke). Excellent fruit is raised in abundance, and exported in considerable quantities. Oil is also made, but in so unskilful a manner as to be of inferior quality; the best is from Algarve. Wines of several sorts, both dry and sweet, are produced; the red Port wine (q. v.) is exported, but in less quantities than formerly, chiefly to England. In 1765, with a view to diminish the disproportion between the cultivation of the vine and of grain, all the vineyards on the Tagus, Mondego and Rouga (with the exception of some districts in Estremadura producing excellent wines), were, by order of government, converted into corn lands. About one third part of the vineyards was thus destroyed; but, after the fall of Pombal, many proprietors planted vines again, as this mode of employing the land was more profitable than tillage. Hemp and flax are raised in the northern districts, but by no means sufficient for the consumption. In many parts of the country, wood is scarce, on account of the little care paid to the forests. Although the country affords excellent pastures, grazing is little attended to, partly owing to summer droughts, and partly to the want of artificial meadows, which are to be found only in Minho. It is also discouraged by the great number of holydays, which amount to nearly one third of the year, and on which abstinence from butcher's meat is required. It is most successfully practised in Beira, Minho and Estremadura. Oxen are used for draft. The horses are small, light, and well formed, but not numerous. Mules are in common use. Sheep are raised in greatest numbers in Beira; the wool resembles the Spanish, but is not so fine. Cows are not much used for milk, which is obtained chiefly from goats. Butter and cheese are imported from Britain and Holland. The Portuguese swine resemble the Chinese variety, and are very fat. Turkeys are raised in great numbers. The bees do not yield wax enough for the churches. The culture of silk, which was formerly extensively carried on, has been in some degree revived in recent times, and, in 1804, yielded 61,700 pounds of silk. Deer, rabbits, hares, and wild boars, are the only game. The birds are not numerous, except red partridges. The rivers, particularly the Tagus, abound in fish; but the consumption is so great that stock fish and salt fish are carried to the country by the British, Americans, and the northern nations, although in the sixteenth century the Portuguese were largely engaged in the Newfoundland fishery. To the prevalence of entails, and the accumulation of the landed property in a few hands (with their consequence that the cultivator is rarely the proprietor of the soil), is to be attributed the smallness of the population. The nobility, now less numerous than formerly, is divided into the higher and lower; the former, in 1805, consisted of thirty-five families, many of which are opulent.

The national character appears to most advantage in the country and the small towns, particularly in the northern provinces, where the Portuguese are friendly, polite, hospitable, frank, moral, temperate and sober. They have inherited the old national hatred against the Spaniards. There are few public amusements except bull-fights. The number of ecclesiastics is stated by Balbi not to exceed 29,000. The king appoints the patriarch, who resides at Lisbon, and has under him nine bishops, five European and four foreign; the ten other Portuguese bishops are under the jurisdiction of the archbishops of Braga and Evora, the former of whom is styled the *primate of the kingdom*. All the bishops are nominated by the king. In 1821, according to the same author, there were 360 convents for men, with 5760 monks, and a revenue of 607½ million reis, and 138 convents for women, with 5903 sisters, and a revenue of 363 million reis. The university of Coimbra has 1600 students. In the capital are four schools for the learned languages, and other useful institutions. The college for young noblemen, established in 1761, is one of the best institutions for education. Little has been done for popular education.

Of late years the useful arts have made progress, but few of the products of Portuguese industry can compare with the corresponding articles of foreign manufacture; the most important are those of wool, silk, cotton, linen, hats, and glass. The most of the manufactories of woollen goods belong to the king, who leases them for a certain number of years to particular companies, with the right of exclusively carrying on the business. The most important manufactories of silk are in Lisbon, Braganza, Oporto, Beja, Mondim, and Almerim, and, prior to 1808, employed 27,000 men. The internal commerce suffers from the want of good roads. Canals there are none, and the few navigable rivers are not so at all seasons. The remains of the Portuguese colonial possessions, and the empire of Brazil, of which the independence, at first at least, was rather an advantage to the mother country, serve to maintain the commerce of Portugal. The exports to those countries amounted, before the late troubles, to 16,000,000 dollars, and the imports from them to 13,000,000; the imports from other countries were estimated at 17,000,000 dollars, and the exports to them at about 12,000,000. As Portugal possesses comparatively few commercial resources in agriculture, the products of manufacturing industry must have formed a considerable item in the sums above-mentioned. The foreign trade is chiefly in the hands of the British, and the direct trade between Great Britain and Portugal was formerly carried on chiefly in British bottoms; but more recently about half the ships engaged in it are Portuguese, and the trade with Ireland is almost wholly carried on by Portuguese vessels. The revenue, in 1827, was 8,500,000 dollars; the expenditure, 11,000,000 dollars; the public debt, in 1824, was 41,500,000 dollars. The army, in 1827, consisted of 50,638 men; besides 27,110 of militia. The navy of Portugal, in the fifteenth and sixteenth centuries, the largest in the world, perished during the Spanish domination; and, although revived under the first princes of the house of Braganza, it again declined. Pombal created a naval force of ten ships of the line and twenty frigates. In 1823, the navy consisted of four ships of the line, eleven frigates, and thirteen smaller vessels. The best sailors are from Algarve and the Azores; the only naval station is Lisbon, where there are an arsenal, dock, marine school, &c.

Portugal and Algarve had been divided into forty-four comarcas; but the civil, military, and ecclesiastical, financial, and judicial powers ran into each other in such a manner as to render a uniform administration impossible. The cortes, therefore, divided the kingdom into thirteen provinces, and simplified the administration of all the departments. In 1749, the king of Portugal received from Benedict XIV. the title of *rex fidelissimus*; and his most *most faithful majesty* styles himself "king of Portugal and Algarve, of both sides of the sea in Africa, lord of Guinea, and of the navigation, conquests and commerce of Æthiopia, Arabia, Persia, and India." The heir to the throne is styled *prince royal*, his eldest son, *prince of Beira*, the other royal children, *infantes* and *infantas of Portugal*. There are seven orders of knighthood; the military order of Christ; the order of San-Iago, for civil merit; the order of Avis, for military merit; the female order of S. Isabella; the military order of the Tower and Sword (founded 1459, revived 1805); the order of Villa Vicosa, or the immaculate conception; and the order of Malta.—*Braganza Line of Princes*. John IV., proclaimed king 1640, died 1656. Alphonso VI. died 1683. Pedro II. died 1706. John V. died 1750. Joseph I. died 1777. Maria Francisca Isabella died 1816. John VI., emperor and king, died 1826. Pedro, emperor and king, abdicated the throne in favour of his daughter donna Maria (born 1819), 1827. Miguel, second son of John VI. (born 1802), usurped the crown, 1828. Miguel expelled, and donna Maria enthroned, 1831.

History. 1. *Earliest Period, before Portugal formed a separate Kingdom, from the Christian Era to A. D.* 1139. The Phœnicians, Carthaginians, and Greeks early traded to this part of the peninsula, which was afterwards conquered by the Romans. (See *Lusitania*, and *Hispania*.) The latter introduced among the inhabitants, a branch of the wide-spread Celts (q. v.), their own civilization; the country was, several centuries later, inundated by the Germanic tribes (see *Alans*, *Suevi*, *Goths*, and also *Vandals*), and in the eighth century (712) was conquered by the Saracens. (See *Moors*.) When the gallant Spaniards of the Christian kingdoms of Castile and Leon (see *Spain*) finally wrested the country between the Minho and the Douro from Moorish hands, they placed counts or governors over this region. Henry the younger of Burgundy, whose grandfather Robert I., duke of Burgundy, was grandson of the French king, Hugh Capet, came into Spain, about 1090, to seek his fortune with his sword, in the wars against the Moors. Alphonso VI., king of Castile and Leon, gave to the chivalric stranger the hand of his daughter in reward for his services, and appointed him (1094) count and governor of the conquered districts, which comprised the provinces Entre Minho e Duero, Tras os Montes, and a part of Beira, and the harbours of Oporto, from which Portugal is said to have derived its name. (See *Oporto.*) The count resided at Guimaraens, owed feudal services to the Castilian kings, but was permitted to hold, in his own right, whatever conquests he should make from the Moors beyond the Tagus. On his death (1109), Alphonso rendered the dignity of count hereditary in Henry's family, and fortune favoured their arms. Henry, and still more his son Alphonso I, were successful in their wars. The latter, threatened by the Moors in 1139, advanced to meet them, and gained the brilliant victory of Ourique. He was saluted on the field, king of Portugal.

II. With this event begins *the Middle Age in the History of Portugal* (1139—1495), which extends to the reign of Emanuel the Great, or the establishment of the Portuguese colonial dominion. The elevation of Portugal to naval and commercial power was the result of its internal organization. The cortes of Lamego confirmed Alphonso in the royal title which he had received from the soldiers in 1143, or, according to some, 1145, and, in 1181, gave to the new kingdom, which was acknowledged by the pope, Alexander III., a code of laws and a constitution. The crown was made hereditary in the royal family, according to the rules of primogeniture, but could pass to the collateral lines only with the consent of the estates. In the failure of male heirs, the daughters were to inherit the crown. The code of laws, which Alphonso had caused to be drawn up, was accepted, and the independence of the newly established throne solemnly declared. The king himself renounced for any of his successors, who should consent to become tributary to a foreign power, the right to inherit the crown. The form of government, however, prepared by the cortes of Lamego, was by no means very definite, and the fundamental laws there promulgated were far from being kept inviolate. Alphonso himself made his kingdom tributary to the pope, but maintained his regal dignity against the kings of Castile and Leon, with whom he was frequently at war. He extended his dominions to the borders of Algarve, and took Santarem in 1143. The capture of Lisbon (1147), which was effected by the aid of some English crusaders and Hanseatics, who ascended the Tagus, was one of the most brilliant events of his warlike life. In 1162, he founded two military orders, the order of Avis (a village near Alentejo), and the order of S. Miguel del Ala. Alphonso I. died 1185. One of his successors, Sancho II., lost the throne (1245) in his disputes with the clergy, by the decision of Innocent IV. Alphonso III. (reigned 1245—79) completed the conquest of Algarve, which had been undertaken by Sancho I., and received the surname of the *Restorer* (*O Restaurador*). He defended the rights of the crown against the church. Among the Portuguese monarchs, Dionysius (1279—1325) is eminently conspicuous; he deserved the glorious epithets, which a grateful posterity conferred on him, of the "just," the "husbandman" (*labrador*), the "father of his country." He opposed with prudence and firmness the encroachments of the clergy, who, under his predecessors, had disturbed the public peace, and claimed an exemption from taxes. He remained on terms of peace with Nicholas IV., the most arrogant of pontiffs, although his measures for preventing the accumulation of landed property in the hands of the clergy, would not allow him to conciliate the good will of the papal court. Himself a scholar and a poet, he was the most generous patron of learning among the princes of the age; he left a monument of his zeal for science, in the college founded by him at Lisbon, which, in 1308, was transferred to Coimbra. He was the first to turn the favourable position of the country for commerce to account, and, by awakening the enterprise of his subjects, he laid the foundation of the greatness of Portugal in the succeeding century, although he was involved in wars with Castile (1295—97), and, in 1299 and 1320, in civil feuds with some of his own family. The policy of this king had the most happy influence on manufactures, commerce, agriculture, and navigation, and the prosperity of the towns placed the citizens in Portugal, as well as in Spain, by the side of the feudal nobility and the clergy, as a third estate of the realm. He instituted the order of Christ, which, in 1319, obtained the estates of the Templars, on the abolition of that order. He was succeeded by Alphonso IV., and the latter by Pedro I., husband of Ines de Castro (q. v.), 1357. With the death of Ferdinand the Gentle, son of Pedro the Cruel, the male line of the Burgundian princes became extinct in 1383. His daughter Beatrice, wife of the king of Castile, should regularly have succeeded him; but the Portuguese were so averse to a connexion with Castile, that the brave John I., natural son of Pedro, was saluted king by the estates. He maintained possession of the throne, having, with the assistance of his general, Alvaro Nunes Pereira, defeated the Castilians at Aljubarotta, in 1385. With him begins the native line of Portuguese kings. After having concluded a peace with Castile in 1411, this excellent prince turned his attention to the improvement of the country. He ruled with a wise moderation, a turbulent people and a haughty nobility, whose power had been increased by the concessions which he had been obliged to make, to secure their concurrence in his accession to the throne. He transferred the royal residence from Coimbra to Lisbon. In his reign began those foreign conquests, which made the greatness of Portugal. His able sons completed what had been commenced by the father, who died of the plague, in 1433. After the conquest of Ceuta, on the northern coast of Africa, in 1415, where the brave princes Edward, Henry, Pedro, received the honour of knighthood from the hand of their father, Henry the Navigator first set on foot those enterprises of discovery and commerce, which raised Portugal above all her contemporaries. He founded the first Portuguese colonies, Porto Santo (1418), Madeira (1420), the Azores (1433), and those on the Gold Coast of Guinea. The reigns of his son Edward (till 1438), and his grandson Alphonso V., were less brilliant than that of John I.; but the latter was surpassed by that of John II., the ablest king that has occupied the throne of Portugal. In his reign began the violent struggle with the nobility, whose power had gained great accessions under his indulgent predecessors. The grants of the crown lands were revoked, and the judicial privileges of the nobility were restricted by the appointment of judges, who were learned in the profession, and not nobles. The king caused the powerful duke of Braganza, the chief of the turbulent nobles, to be beheaded, and the new leader of the malcontents, the duke of Viseo, was put to death by the king's own hand, in 1483. The expeditions of discovery were conducted with ardour, and often with scientific method. The rich profits of the trade with Guinea supplied resources for new enterprises. The active spirit, which was now more and more evidently developed among the Portuguese, was quickened by the Jews, 83,000 of whom, driven from Castile, were received into Portugal on the payment of a capitation tax, and the most learned of this nation were then to be found in Portugal. In 1481, John sent two experienced men to attempt to reach the East Indies by land, the commercial wealth of which was the great object of his enterprises. In the same year, Diaz (q. v.) returned from a voyage in which he had discovered the southern cape of Africa, to which the king, foreseeing the great importance of the discovery, gave the name of the *cape of Good Hope*. The success of these expeditions, and the riches which the commerce of the newly discovered countries poured into Portugal, may excuse the neglect with which the proposals of Columbus, to seek new lands in the west, were received at the Portuguese coast. But after the happy issue of that great discoverer's enterprise was known, John also sent out a fleet to the west. Thence arose the dispute between Portugal and Castile, which pope Alexander VI. finally settled by the line of demarkation, drawn 100 leagues west of the Azores and Cape Verd islands, and separating the future conquests of the two crowns. Thus was established, by Portuguese policy and energy, that colonial system with which begins the modern history of Europe.

III. *The Modern History of Portugal* extends, therefore, from 1495 to 1820, from the most flourishing period of the country to the restoration of the cortes, and of a free constitution. This period embraces three epochs;—1. that of the commercial grandeur of Portugal, from 1495 to the extinction of the Burgundian line in 1580; 2. that of the decline of Portugal under the dominion of Spain, 1580—1640; and, 3. that of the history of Portugal under the house of Braganza, and British influence, to 1820.—(1.) *The Golden Period of Portugal* (1495—1580). What John II. had begun with such fair prospects, was continued under the fortunate reign of Emanuel (1495—1521). In 1497, he fitted out an expedition of four ships, under Vasco da Gama (see *Gama*), which arrived safely at Goa; and thus was the passage to India by sea laid open by the Portuguese. In the beginning of the sixteenth century, the great Almeida (q. v.), first Portuguese viceroy in India, conquered Ceylon. Albuquerque (q. v.) made Goa, the most important harbour in India, the capital of Portuguese India, and traded to the Moluccas. Lope de Soares opened a commerce with China in 1518. Emanuel ruled from Babelmandeb to the straits of Malacca, and the power of Portugal had now reached its height. (See *East India Companies*, and *India*, division *Portuguese India*.) On this distant stage were performed great deeds of heroism; and this is the most glorious period of Portuguese history. The national spirit of the people was animated with youthful force and fire, and produced heroes, inspired solely with a zeal for the honour and grandeur of their country. Lisbon became the most important commercial city of Europe; but the wealth which commerce accumulated was hardly sufficient to meet the expenses of the campaigns in Africa, where the arms of Emanuel were less successful. The king of Congo had, indeed, allowed himself to be baptized by the missionaries, without whom no discovery ships then sailed and sent his two sons to Portugal, to be educated, and the colony on the Guinea coasts, from which all other nations were excluded by the Portuguese, was a source of great wealth; but the enterprises in Northern Africa were unsuccessful. The unfavourable character of the country prevented a rapid progress, and it is highly probable that Venice and Spain, jealous of the Portuguese prosperity, secretly afforded assistance to the Moorish princes. The fame of Emanuel's conquests in India was no indemnification for the depopulation of Portugal by the loss of so many of her most vigorous youth, sent to extend or defend those conquests. In the reign of John III., son of Emanuel (1521—57), the Indian discoveries and commerce were still further extended; but the consequences of the rapid accumulation of the precious metals at home, without a corresponding increase of domestic industry, already began to appear. The inquisition was introduced in 1536, to be employed against those Jews who had adopted the externals of Christianity. The wise John II. had received into the kingdom a great number of those whom the intolerant rigour of Ferdinand and Isabella had driven from Spain; but they were still treated with so much severity, that Emanuel had at first intended to extend to them greater indulgence. But in the first intoxication of his passion for his wife, the beautiful Eleonora, sister of Charles V., the old king was persuaded to proceed with such rigour against the Jews, as to require them to embrace Christianity, under the penalty of being deprived of their children and made slaves. Whether they found means to prevent the execution of this cruel order, or whether Emanuel feared the effects of their despair, it is certain, that he allowed them twenty years for their conversion. This measure led a great many of the Jews to conform publicly to the Christian usages, while they secretly adhered to their faith. The inquisition practised the most revolting cruelties on their descendants. Still more injurious in its consequences than the inquisition, was the admission of the Jesuits into the kingdom by John III. (1540), who received them into his dominions earlier than any other European prince, as if he had been doomed to undermine the prosperity of his kingdom. The artful Jesuits gladly allowed themselves to be employed as preachers of the faith in India, where the Franciscans had hitherto been principally employed. The education of his grandson, Sebastian, the heir apparent to the throne, was likewise intrusted by John to the Jesuits, the worst tutors of princes. They inspired the young prince with that spirit of bigotry, and that fanatical ambition, which led to his death. He resolved to reduce the Moors in Africa (an attempt in which his powerful predecessors had always failed), and persevered in his projects with a wilful obstinacy, in opposition to the remonstrances of his wiser counsellors. In 1578, having, as is supposed, lost his life in the battle of Alcassar, he left his throne without an heir; and from this period Portugal sank rapidly from her former prosperous condition.

(2.) *Portugal under the Dominion of Spain* (1580—1640). After the short reign of the old and feeble Henry, uncle of Sebastian, Philip II. of Spain, the most powerful candidate for the throne, obtained possession of the kingdom by the victory of Alcantara, and Portugal had the misfortune to be annexed to a kingdom, which, from this time, was hastening its own decline by a series of unsuccessful wars, and by its unwise administration. Philip II. introduced the censorship (December 4, 1586), and overthrew four Pseudo-Sebastians. (See *Sebastian*.) England and Holland, the powerful enemies of Spain, now attacked the defenceless Portugal, the wealth of which promised so rich a booty, and whose possessions were now gradually torn away. The old heroic spirit of the nation was quenched in the last days of its independence, and the Portuguese had made themselves so much hated by their arrogance and severity, that the oppressed princes and people of Asia were eager for any change. Spain made no exertions in favour of a nation which she had involved in her own declining fortunes. The Dutch conquered the Moluccas (q. v.), and, in 1624, half of Brazil, which had been discovered (1500) through a fortunate accident, in the flourishing period of the reign of John II., by Alvarez de Cabral. They took possession of the settlements on the coast of Guinea in 1637, and forced their way into the rich markets of India, where they pressed hard upon the Portuguese. To these losses was added the rapacity of the Spaniards, who alienated the finest domains of the Portuguese crown. The Portuguese nobility, exasperated by this oppression, and the contemptuous conduct of Olivarez, minister of Philip IV., entered into a conspiracy, which was planned and executed with great art, and, December 1, 1640, placed on the throne John IV., duke of Braganza, a descendant of the old royal family.

3. *Portugal under the House of Braganza, and dependent on the Policy of England* (1640—1820). In justification of this revolution, which restored the independence of Portugal, the cortes of 1641 issued a manifesto, addressed to the powers of Europe. The war with Spain, which was the result of this measure, was terminated by a treaty of peace in 1668, and a renunciation, on the part of Spain, of her claims to the Portuguese crown. A treaty of peace was also concluded with Holland, under English mediation, by Alphonso VI., successor of John, and Pedro II. (who, in 1667, had deposed his brother Alphonso), by which Brazil was restored to Portugal; but its former greatness could not now have been restored, even had the princes of this line displayed as much vigour and wisdom as some of them showed good intentions. A commercial treaty had been concluded with England under the first Braganza prince, and, in 1703, a new treaty was concluded by the English ambassador, Mr Methuen, which secured to England the advantages of the newly discovered gold minds in Brazil. From this time the relations with England continued to become more intimate, until Portugal was no longer in a condition to maintain an independent attitude in European politics. The cortes, in the ordinance for assembling which the king had expressly required, that the third estate should send as deputies no persons who held offices in the department of finance, in the judiciary, the army or the navy, was not summoned after 1697. During the long reign of John V. (1707—50), some vigour was exerted in regard to the foreign relations, and something was attempted for the promotion of the national welfare at home (the restrictions on the power of the inquisition, and the foundation of an academy of Portuguese history, for example); but, in the former case, without decisive consequences, and, in the latter, without a completion of the plans proposed, while the sumptuous monastery at Mafra, and the dear-bought permission to institute a patriarch of Lisbon, exhausted the resources of the country. Under his son and successor, Joseph I., the marquis of Pombal (q. v.), a vigorous reformer, such as Portugal required, administered the government. He attacked the Jesuits and the nobility, who, during the preceding reigns, had exercised a secret influence in the government. The exposure of the power of the Jesuits in Paraguay, their conduct at the time of the earthquake in Lisbon (in 1755), and the conspiracy against the life of the king (1759), led to the suppression of the order, in 1757, they had been deprived of the post of confessors to the royal family, and forbidden the court. Two years after, all the Jesuits were banished the kingdom, and their estates were confiscated. The brave Count of Schauenburg Lippe, to whose services against Spain (1760) Portugal was so much indebted, likewise reformed the Portuguese army; but, soon after his departure, the effects of his improvements disappeared. On the accession of Maria Francisca Isabella, eldest daughter of Joseph (in 1777), Pombal lost the influence which he had possessed for twenty-five years. To him Portugal owed her revival from her previous lethargy; and although many of his useful regulations did not survive his fall, yet the enlightened views which he introduced, and the national feeling which he awakened, were not without permanent effects. During the reign of Maria, the power was in the hands of an ignorant nobility, and a not less ignorant clergy. In 1792, on account of the sickness of the queen, Juan (John) Maria Joseph, prince of Brazil (the title of the prince-royal until 1816), was declared regent (see *John VI.*), and, in 1799, her malady having terminated in a confirmed mental alienation, the prince was declared regent with full regal powers, but made no change in the policy of the government. His connexions with England involved him in the wars of that power against France; and the Portuguese troops distinguished themselves, by their valour in the peninsular campaigns. But commercial distress, the accumulating debt, and the threatening language which Spain was compelled by France to adopt, led to a peace with France in 1797. The disasters of the French arms, in 1799, encouraged the regent to renew hostilities, in alliance with England and Russia; but after general Bonaparte had established his authority, Spain was obliged to declare war against Portugal (1801), which, however, was terminated the same year by the treaty of Badajoz, by which Portugal was obliged to cede Olivenza, with the payment of a large sum of money to Spain. Portugal, meanwhile, preserved a mere shadow of independence by the greatest sacrifices, until at last Junot entered the country, and the house of Braganza was declared, by Napoleon, to have forfeited the throne (on account of the refusal of the prince to seize the English merchandise in his dominions). The regent now threw himself entirely into the arms of the English, and, Nov. 29, 1807, embarked for Brazil. Junot entered the capital the next day, and Portugal was treated as a conquered country. An English force was landed, and, in the northern provinces, numerous bodies of native troops determined to sustain the struggle for freedom; a junta was also established in Oporto to conduct the government. After some hard fighting, the decisive battle of Vimeira took place (Aug. 21, 1808), which was followed by the convention of Cintra, and the evacuation of the country by the French forces.—See Thiebault's *Relation de l'Expedition de Portugal* (Paris, 1817). The Portuguese now took an active part in the war for Spanish independence. (See *Spain.*) On the death of Maria, John VI. ascended the throne of Portugal and Brazil. This transference of the court of Lisbon into an American colony was followed by important consequences: firstly, that Brazil attempted to withdraw itself from dependence on England, and, secondly, that the colony gradually became a separate state; in Portugal, on the contrary, the

influence of England continued, and the condition of the kingdom was not essentially changed. The peace of Paris (May 30, 1814), by no means, therefore, corresponded to the expectations of the nation, although it had exerted itself vigorously in the common cause, and Spain evaded the restitution of Olivenza, which had been provided for by the congress of Vienna, at the same time that Portugal was required to restore French Guiana to France. The court of Rio Janeiro, therefore, occupied the Banda Oriental, and Portugal was involved in new difficulties with Spain. (See *Brazil*.) In 1815, the inquisition was abolished in the Portuguese dominions; the Jesuits were refused admission into them; and the Jews, at the request of the pope (1817), were allowed the same privileges which they enjoyed in the Roman states. The absence of the court was viewed with dislike by the nation; the military were dissatisfied with the influence of marshal Beresford and the general feeling required some fundamental changes in the administration and constitution of government: thus commences the recent history of Portugal.

Portugal since 1820. On the morning of Aug. 24, 1820, began the revolution, in which the army and citizens acted in concert. The soldiers were induced by their officers to swear obedience to the king, the cortes, and the constitution which should be adopted. The magistrates and citizens declared in favour of the measure, and a junta was established, which addressed a declaration to the nation, in which they assert that the convocation of the cortes, and the adoption of a new constitution, were the only means by which the state could be saved. All the garrisons from Minho to Leyria embraced the constitutional cause, and the troops of the regency, established at Lisbon, refused to act against their countrymen. September 15, all the troops and the citizens in Lisbon declared for the king, the cortes, and the constitution. The revolution was attended by no violence nor bloodshed. A provisional government was established, which, October 1, formed a union with the junta of Oporto. Count Palmella, the head of the royal regency, was despatched to Rio Janiero, with an account of what had happened, and a petition, that the king or the prince-royal would return to Lisbon. The mode of electing the cortes was settled chiefly in imitation of the Spanish constitution, and the liberal party, which was desirous of the immediate adoption of that constitution, obliged the supreme junta, November 11, to administer the oath of obedience to it to the troops. The latter took the oath, but the eighth battalion, under colonel Sepulveda, acceded to this measure only to prevent a civil war. On the 14th, four members of the junta and 150 officers, dissatisfied with this act of violence, resigned their posts; and it was soon after agreed by a meeting of officers, with the general approbation, that no part of the Spanish constitution should be in force, excepting the regulation of the mode of election, until acted upon by the cortes. The elections fell chiefly upon the clergy, lawyers, and officers, and the first session of the cortes was opened January 26, 1821, under the presidency of the archbishop of Braga. It proceeded to name a regency and a ministry, sanctioned the insurrections of August 24, and September 15, 1820, and abolished the inquisition. March 9th, the articles of the new constitution, securing freedom of person and property, the liberty of the press, legal equality, and the abolition of privileges, the admission of all citizens to all offices, and the sovereignty of the nation, were adopted almost unanimously. There was more diversity of opinion concerning the organization of the chambers, and the royal veto; but large majorities finally decided in favour of one chamber and a conditional veto. After some disturbances in Brazil (q. v.), the king sailed for Portugal, where he was not permitted to land (July 4) until he had given his consent to several acts of the cortes, imposing restrictions on his power. On landing, he immediately swore to observe the new constitution, and concurred, without opposition, in all the succeeding acts of the cortes. The Austrian and Russian ambassadors left the country; the separation of Brazil from Portugal (1822) followed, and the country was disturbed by several movements in favour of the old system of government. The constitution was finally completed and sworn to by the king, October 1, 1822, and the session of the extraordinary cortes was closed November 4. The ordinary cortes was convened December 1, and was occupied to the end of its session (March 31, 1823) in reorganizing the different departments of the administration. France declared that she had no intention of interfering with the affairs of Portugal, and the duke d'Angouleme refused to enter into any connexions with the Portuguese insurgents under count Amarante, who was driven, after several sanguinary engagements, from the northern provinces, and fled into Spain. A Portuguese regency was established in Valladolid (May, 1823), under the presidency of the patriarch of Lisbon, who had been banished the kingdom; and the plot for overthrowing the constitution, at the head of which was the queen (a Spanish infanta), and in which several of the nobility and clergy were engaged, was now ripe for execution. Dom Miguel (q. v.), after assuring his father of his determination to maintain the constitution, went to Villafranca, where he was joined by several nobles and many officers, with several regiments of troops, and invited the nation to rise, under the royal standard, against the anarchical policy of the cortes. At the same time, general Sepulveda, in Lisbon, had been gained over by some members of the cortes, and the ministry, to assist in the overthrow of the liberal party, and to effect the introduction of a new constitution with two chambers; but Sepulveda, who was already suspected by the cortes and the national guards, was prevented from accomplishing the plan of carrying off the king, and did not join the prince till the evening of May 29. But the garrisons of the provincial towns declared for the Infant; general Rego did the same, June 4; and count Amarante advanced from Spain with his forces. The troops remaining at Lisbon also joined the absolute party, and John VI., yielding to the instances of the soldiery, entered the camp of the Infant, named a new ministry, and declared the constitution of 1822 null. Sixty members of the cortes, finding their cause lost, signed a protest against the new order of things, and the king entered Lisbon, June 5. Petitions were sent up, requesting the king to reassume absolute power, the restoration of which was the object of the counter-revolution. But the king still declared his determination not to comply with this request. The national guards and militia were disarmed; the church property restored; the patriarch of Lisbon recalled; Amarante reinvested with his former rank and rights; several adherents of the cortes banished or imprisoned; and a censorship of the press established. Finally, June 17, a junta was organized, at the head of which was Palmella, to draw up a constitution adapted to a representative monarchy. The theocratical party and the absolutists, supported by France and Spain, and of which the queen was the rallying point, exerted themselves to prevent the establishment of a constitution. The queen returned to Lisbon, June 18, and, a few days after, Amarante made his entry into the capital with his followers to the number of 3000 men; he was created marquis of Chaves (the name of the town where he had organized the insurrection against the Cortes), with an income of 3000 dollars. The police, under the direction of the absolutists, now proceeded to prosecutions against the constitutionalists, who were banished into the provinces, and secret societies, particularly those of the freemasons (who were considered to have acted an important part in the revolution), were denounced. Dom Miguel, who had been appointed commander-in-chief, composed his staff of decided enemies to the constitution, and filled the offices in the army with his adherents. The new diplomatic corps in Lisbon began to influence public affairs; several powers congratulated the king and prince on the restoration of legal order; the British court aimed at the recovery of its former ascendency, while the Portuguese endeavoured to conciliate the favour of all the great powers, with the hope of preserving Brazil through their interference. The Portuguese commissioners were not allowed to land in Brazil, and the exhausted treasury would not permit the government to execute its plan of an expedition against the country. The intrigues of the absolutists still continued, and a Spanish ambassador, the duke of Villa Hermosa, having appeared at Lisbon (April 7), the queen's party determined to annihilate the hopes of the constitutionalists, and to put an end to the system of moderation (to which the king adhered) at one blow. April 30, 1824, dom Miguel called the troops to arms, and issued proclamations, in which he declared that it was his intention to complete the work of May 27, 1823, and to deliver the king from the pestilent sect of freemasons, &c. On the same day, the ministers and several other civil officers, to the number of about a hundred, were arrested, and no person, not even of the diplomatic corps, was allowed access to the king, until the French ambassador obtained an audience, and was assured by him that every thing had been done without his orders. The Infant, therefore, declared that he had taken these steps on his own authority, to frustrate a conspiracy, which was on the point of breaking out, against the life of the king and the queen. On the representations of the ambassadors, the king ordered the troops to retire to their quarters, and commanded the release of the persons who had been arrested; but May 3, he issued a decree, commanding the summary investigation and immediate punishment of the (pretended) treason; and he pardoned the Infant for having exercised an extraordinary power in the royal name, on account of the urgency of the case. The Infant, however, continued to issue orders on his own authority; the arrests continued; the king was closely watched; and the prince was already talked of for regent. But the ambassadors protested against the violences of April 30, and preparations were made, with the king's consent, for receiving him on board an English ship of the line, lying in the Tagus. May 9, under pretence of making a visit to a palace beyond the Tagus, he escaped to the ship, with his two daughters, and the whole diplomatic corps assembled in the same vessel. The king now deprived the Infant of his command, and summoned him to his presence. The prince obeyed, confessed that he had been deceived and misguided,[*] and received the royal pardon, with permission to travel. May 14, the king returned ashore, and, June 5, 1824, proclaimed an act of amnesty for the adherents of the cortes of 1820, from which only a few exceptions were made (of the authors of the insurrection of Oporto, August, 1820, and nine superior officers in particular), and on the same day appeared the decree of June 4, reviving the old constitution of the estates, and summoning the cortes of Lamego. At the same time, the junta for the preparation of a constitution was superseded by another, which was directed to make preparations for the election of the deputies of the old cortes. But Spain opposed the convocation of the old cortes, and the influence of the queen and the patriarch was thus revived. New conspiracies were detected against the ministers and the king; in consequence, several arrests were made in October The ministry was divided in its views, principally in regard to the policy to be pursued towards Brazil, and, January 15, 1825, a new ministry was named. After many difficulties and protracted negotiations, the independence of Brazil was finally acknowledged (November 15, 1825) by John VI. who merely retained the imperial title in his own person. The Brazilians and Portuguese were to be treated by the respective powers as the subjects of the most favoured nation. March 10, 1826, John VI. died, after having named the Infanta Isabella regent. She governed in the name of the emperor of Brazil, as king of Portugal. April 23, 1826, dom Pedro (IV. of Portugal) granted a constitution (*Carta de Ley*), establishing two chambers, and in other respects resembling the French charter. May 2, he abdicated the Portuguese throne, in favour of his daughter donna Maria (he remaining king during her minority), on condition of her marrying her uncle Miguel. But a party (secretly favoured by Spain) was formed in Portugal, which aimed at the overthrow of this constitution, which had been sworn to by the queen, by the two chambers, and all the magistrates, and even by dom Miguel himself (in Vienna, October 4, 1826), and proclaimed the prince absolute king of Portugal. The marquis of Chaves and the marquis of Abrantes appeared at the head of the insurgents, and Spain, which alone had not acknowledged the new order of things, assembled an army on the Portuguese frontiers. Portugal, therefore, appealed to England for assistance, and 15,000 British troops were landed in Lisbon; they occupied the most important points; the insurrection was completely put down by the government, in February and March, 1827, and Spain was forced to yield. The cortes, which had been convened in October, 1826, closed its session in March, 1827. In July, dom Pedro named his brother dom Miguel lieutenant and regent of the kingdom, with all the rights established by the charter, according to which the government was to be administered. The prince, accordingly, left Vienna, and, passing through Paris and London, arrived at Lisbon in February, 1828. The cortes was in session, and, on the 26th, Miguel took the oath to observe the charter, in the presence of the two chambers. But the apostolicals or absolutists, to whom the disposition of the regent was well known, already began to speak openly of his right to the throne, and to hail him as absolute king. His ministers were all appointed from that party, except the count Villa Real, and the populace were permitted to add to their cry, "Long live the absolute king," that of "Down with the constitution." March 1, the day fixed by the prince for receiving the congratulations of the functionaries on his return, the palace yard was filled with a crowd, who obliged each person who appeared to join in the shout for the absolute king, and actually committed acts of personal violence on some constitutionalists. The officers of the garrisons favourable to the charter were removed, and their places filled by men devoted to the court. It was now determined that Miguel should go to Villa Viçosa, a town near the Spanish frontier, where he could be supported by the troops of the marquis of Chaves, and be proclaimed absolute king; but this project was frustrated by the decision of Mr Lamb, the British minister, who counteracted the order for the departure of the British troops, and prevented the payment of the loan made to dom Miguel under the guarantee of the British government. The cortes, being opposed to the designs of the prince, was dissolved March 14, and the recall of the British troops in April removed another obstacle from his path. May 3, he accordingly issued a decree in his own name, convoking the ancient cortes of Lamego, which had not met since 1697. The military in general was not favourable to the projects of the prince, and, May 18, the garrison of Oporto proclaimed dom Pedro and the charter. They were soon joined by the other garrisons, and by the students of Coimbra, and the constitutional army, 6000 strong, advanced towards Lisbon. But they pushed their operations with little vigour, until at length they were met by superior forces and defeated, towards the end of June. The constitutional junta at Oporto dissolved itself, and the troops either forced their way to the Spanish frontiers, or embarked for England.—Thus terminated the first efforts of the constitutionalists in Portugal, and, with the extinction of that party, the influence of England in the Portuguese government ceased. Miguel now turned his attention to the consolidation of his power; severity and cruelty were his expedients; the prisons were crowded with the suspected, and foreign countries were full of fugitives. The cortes met, June 23, and, with great unanimity (all, whose opposition was feared, being in prison or having taken flight), declared dom Miguel lawful king of Portugal and Algarve, chiefly on the grounds that dom Pedro had become a foreigner by becoming a Brazilian citizen, and was not a resident in the country, and that therefore he could neither succeed to the throne himself, nor name the person who should succeed in his stead. July 4, 1828, Miguel confirmed the judgment of the cortes, and assumed the royal title. He immediately established a special commission to punish all who had taken part in the Oporto insurrection, the members of the commission being to be paid from the confiscations they should make. An expedition was sent out (August 9) against the islands which refused to acknowledge Miguel, and Madeira and the Azores, with the exception of Terceira were reduced. A new expedition against the latter place (October) failed. In the islands, the same course of condemnation was pursued, that had been practised at home. Portugal now became the prey of political and religious bigots. In March, 1830, the regency appointed by dom Pedro, as guardian of his daughter, was installed in Terceira, consisting of Palmella, Villa Flor, and Guerreiro. The other islands were afterwards reduced by the forces of the regency, and subsequently to the return of dom Pedro to Europe, it was well known that he was making preparations for displacing Miguel from his usurped seat. Meanwhile insurrections repeatedly broke out at home, but were suppressed by the vigour of the government and the want of concert in the insurgents. In 1830, it was estimated that the number of prisoners confined for political causes was above 40,000, and that the number of persons concealed in different parts of the country was about 5000. Besides these victims of tyranny, foreign countries, as is well known, were thronged with Portuguese fugitives. In consequence of some acts of violence, and a refusal of redress on the part of the government, a British fleet was sent to the Tagus to enforce the demands of the English government (May 4, 1831); but on its appearance the concessions required by Great Britain were made. In July (11), Miguel was obliged to suffer a second humiliation of this nature; a French fleet having forced the passage of the Tagus, and taken possession of the Portuguese fleet, in consequence of the demands of the French government, for satisfaction for injuries to French subjects, committed by the Portuguese authorities, not having been complied with. The court of Lisbon was forced, by this vigorous measure, to submit to the terms imposed by the French, which included the dismissal of some of the Portuguese functionaries, an indemnity for the expenses incurred by the expedition, the reversal of all sentences pronounced against Frenchmen for political opinions, and the publication of these terms in the Lisbon Gazette. In August, an insurrection of the troops broke out against Miguel. In the midst of these events, dom Pedro was on his way for Europe. He embarked on board an English ship of war, in the spring of 1831, and arrived in France in June. From thence he proceeded to Oporto, and immediately commenced operations for displacing dom Miguel from the throne, and establishing donna Maria as queen under a regency. Previous to this, large bodies of volunteers had embarked from Britain and Ireland in the cause of dom Pedro, the greater number of whom were garrisoned in Oporto Dom Miguel, meanwhile, was not inactive, but advanced with his adherents towards that city, which he attacked several times without success. His most energetic attack was made on the 21st September, 1832, when he was repulsed with the loss of 1500 men, dom Pedro's loss being calculated at 500. In July of the same year, a naval battle took place between the fleet of dom Pedro, under the command of admiral Napier, and that of dom Miguel, in which the latter was defeated, with the loss of two ships of seventy-four guns, a frigate of fifty-six, a storeship of forty-eight, and two smaller vessels. This event, with other successes of the Pedroite party, led to dom Miguel's abandonment of the throne. Donna Maria da Gloria was proclaimed queen of Portugal, and in 1835, was married to the duke of Leuchtenberg, son of Eugene Beauharnais. The prince died in March of the same year, after having been married little more than one month. In July, 1836, there was a sudden outbreak of a new revolution at Lisbon with a demand for the Portuguese Constitution of 1820. This demand was acquiesced in, but not cordially, by the queen and peers, and at present the political horizon of Portugal is unsettled. See the works of Murphy, Link, Ruder, Chatelet, Costigan, Southey, &c.; see, also, Antillon's *Geografia d' Espanna y Portugal* (Valencia, 1815); Balbi's *Essai Statistique sur Portugal* (Paris, 1822), and his *Variétés Politico-statistiques sur la Monarchie Portugaise;* and Miss Baillie's Lisbon in 1821—23.

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[*] He is also said to have confessed all the circumstances of the murder of the marquis of Loule, a royal chamberlain, who had been found dead, March 1.

Portuguese Language and Literature. Among the Romanic languages, which originated from a mixture of the Latin and Teutonic, is the Portuguese. It is not a dialect of the Castilian; for, besides the difference in its structure and pronunciation, it was formed earlier than the Castilian. The two resemble each other about as much as the Danish and the Swedish. Respecting the mixture of the Arabic, Fr. Joao de Sous has written a good book (*Vestigios da Lingua Arabica em Portugal*

When Henry of Burgundy took up his residence at Guimaraens, many Frenchmen followed him, which caused a number of French expressions to pass into the language of the country. The national spirit of the Lusitanians always turned with pleasure to the vernacular tongue, and strove to apply it to every branch of literature; yet it cannot be denied that patriotism carries the Portuguese too far in his admiration of his mother tongue. Franc. Diaz Gomes, a celebrated Portuguese author and poet, calls it "rich, melodious, impressive, proper for all subjects, and in its pronunciation corresponding to its orthography." Its delicacy and its richness in songs gave it, even in Spain, the name of the *flower language*. Yets its pronunciation is difficult for the foreigner, particularly its nasal and guttural sounds. In respect to the *j* and *ch*, in respect to the nasal sounds, and the mute endings, its pronunciation is like the French. Sismondi, more wittily than correctly, calls the Portuguese language *un Castilian désossé* (a boneless Castilian), because the Portuguese have generally omitted the middle consonants, and particularly the *l*; as, for instance, in *dòr* for *dolor*, *Afonso* for *Alfonso*. The Portuguese was used earlier than the Castilian, and became the language of the country under Alfonso I., son of Henry of Burgundy. Early epic attempts were followed by books of songs, to which succeeded sonnets, and, in the fourteenth century, prose. The best grammar is Pedro Jose de Figueiredo's *Arté da Grammatica Portugueza* (Lisbon, 1799), and the best dictionary, the revised edition of Bluteau, by the Brazilian Anthony de Moraes Silva (Lisbon, 1789, 2 vols., 4to.) Ribeiro dos Santos has done the most towards investigating the spirit of the Portuguese language. As a conversational language, the Portuguese is considered to have advantages over the Spanish. It is more concise, easy, and simple, well adapted for easy conversation; and the social tone and the spirit of the Portuguese are much like what the French probably was in former times, for we still find with the Portuguese a kind of good-natured and artless politeness. The richness of the language in synonymes, diminutives, and augmentatives renders it expressive and very various: at the same time it is concise and perspicuous, as almost all the substantives have corresponding adjectives, verbs, and adverbs. A number of them cannot be rendered in other languages without paraphrase. The Portuguese language is almost the only monument of the former greatness of the Portuguese empire, for it is yet the general language of commerce in India and Africa.

The Portuguese literature is pretty complete without being rich: in all branches we find happy attempts; in none abundance, except in lyric and bucolic poetry. Yet the short period of its bloom has passed. Its poetry has splendour and feeling, much epic dignity, spirit, and dramatic vivacity, but little ideal elevation. It comprises the most important part of the literature, for prose has remained in a backward state in this nation, which, fettered by ignorance, and destitute of philosophy and criticism, could not rise to history or eloquence. The chief causes of this imperfect state of its literature have been the Spanish dominion and the inquisition. It became and remained bombastic and affected: the ancient power, the natural grace, were lost. In the time of Louis XIV., the French were copied, and many Gallicisms were admitted. It was not till the time of Pombal (q. v.) that poets gave elevation to the language. After that time, the prose also became more simple and pure. Pombal was the first who banished the scholastic logic and metaphysics from the lecture-rooms of Coimbra; but the study of the ancient languages continues to be neglected. According to Balbi, there are, in the whole kingdom, not more than eight schools for the Greek language. For their first acquaintance with philosophy, botany, medicine, astronomy, cosmography, and Hebrew, the Portuguese are indebted chiefly to the Jews. Scientific studies, especially mathematics and natural history, are not entirely uncultivated, but attract little interest; and it is asserted that, among the 3,000,000 of Portuguese, there are hardly 500 readers of scientific books. According to Balbi, there were printed, from 1801 to 1819, about 1800 new works, of which 1200 were originals, 430 translations, 57 periodical works, 40 new editions. Besides these, the academy of sciences and the university at Coimbra caused 116 works to be printed in the same period. All Portugal had, in 1827, but sixteen printing-offices; one in Coimbra, three in Oporto, twelve in Lisbon. Those three places are also the only ones containing considerable libraries and establishments for the sale of books. How much this little may have been lessened of late, since an outrageous tyranny has been plunging that unfortunate country deeper and deeper into barbarism, we cannot say. The style of the Portuguese prose writers is often embarrassed, obscure and full of repetitions. Of late years, however, they have been employed on translations of good English and French prose writers, which will contribute to improve the taste of the nation. These translations have been chiefly of novels. Their own novels and tales continue to be written in the style of the first Portuguese work of belles-lettres in prose, a tale of pastoral life and chivalry—*Menina e Moça* (the Innocent Maiden)—by Bernardim Ribeiro (printed with his eclogues, Lisbon, 1559), which gave the tone in Portugal, which Montemayor, a Portuguese, afterwards introduced into Spain, and which, some time later, was imitated in France and Germany. The most popular national romance in Portugal, the *Historia de Carlos Magno e dos doze Pares de França por Jeronymo Moreira de Carvalho* (Lisbon, 1784, 2 vols.), amuses by its comic bombast. Among the best Portuguese original romances are the old *Palmeirim de Ingalterra* (exempted by Cervantes from the flames), written by Franc. de Moraes (an edition of it was printed at Lisbon, 1786, in 3 vols., 4to), and the *Feliz Independente*, which was translated into Spanish, and in that language went through six editions. The treasures of the Portuguese language may be in some degree judged from the *Catalogo dos Livros, que se hao de ler para a continuçaõ do Diccionario da Lingua Portugueza mandado publicar pela Academia real das Sciencias de Lisboa* (1799). The oldest works mentioned in it are of 1495 and 1502. The former is the *Livro da Vita Christi, por Valentim de Moravia, e Nicolao de Saxonia* (Lisbon, 4 vols., folio); the latter a translation of the travels of Marco Polo and Nicolao Veneto to India, with a map by a Genoese, by Valentim Fernandes (Lisbon, folio). Only one volume of the dictionary of the academy has appeared (in 1793), a thick folio containing A, which letter embraces the fifth part of the words in the language. Respecting the history of Portuguese literature, Bouterwek's *Geschichte der Poesie und Beredtsamkeit seit dem Ende des* 13 *Jahrhunderts* (History of Poetry and Eloquence since the End of the Thirteenth Century, 11 vols.) is the chief work. Sismondi, in his *Littérature du Midi de l' Europe* (4th vol.), has followed this. A short history of the Portuguese language and literature is also to be found in the preface of Joaquim de Santa Rosa de Viterbo's

Elucidacaõ das Palavras, Termos e Frases que em Portugal antiguamente se usaraõ, &c., que hoje regularmente se ignoraõ, &c. (Lisbon, 1798, 2 vols.), and in Balbi's *Essai Statistique* (Paris, 1822, 2 vols.)

Portuguese poetry flourished earlier than the Castilian, and all accounts of the first civilization of the Portuguese, says Bouterwek, indicate an original poetical direction of the mind of the whole nation. The most ancient known Portuguese poets are of the twelfth century—Gonzalo Hermiguez and Egaz Moniz, whose songs the Portuguese of the present day do not readily understand. In the thirteenth century, the language became more and more regular and distinct. King Dionysius, in the second half of this century, was a patron of literature, and even a poet himself. Alphonso IV. and Peter I. are mentioned as poets of the fourteenth century. Even in this early period, Italian poetry seems to have had an influence on the Portuguese, as several sonnets prove. Dom Pedro, son of John I., translated some of Petrarch's sonnets. But with the fifteenth century, the era of the heroic age of Portugal, begins the flourishing period of Portuguese literature, when it vied with the Spanish. A tender as well as heroic spirit, a fiery activity, and a soft enthusiasm, war and love, poetry and glory, filled the whole nation, which was carried, by its courage and spirit of chivalrous enterprise, far over the ocean to Africa and India. This separation from home, and the dangers encountered on the ocean, in distant climes and unknown regions, gave their songs a tone of melancholy and complaining love, which strangely contrasts with their enthusiasm for action, their heroic fire, and even cruelty. The *cancioneri* of the time of John II. contain such complaints of love, but neither Bouterwek nor Sismondi were able to find these collections. The Portuguese *cancionero*, discovered by Joaquim José Ferreira Gordo, at Madrid, in 1790, comprising poems by a hundred and fifty writers of the fifteenth century, is known only by what is contained respecting it in the *Memorias de Litteratura Portug.* The first celebrated Portuguese poet was Bernardim Ribeyro, under Emanuel the Great (1495—1521). He introduced into Portuguese literature the notion of an ideal pastoral life, and was a learned man, esteemed at the court of Emanuel. His romance has been mentioned above. This direction of taste gave rise to the many pastoral poets of Portugal, who are tender, graceful, languishing, but often monotonous and cold. This is a kind of poetry with which our age has little sympathy. The admiral and governor of Madeira, Christovao Falcao, Ribeyro's contemporary, has expressed the pain of unsuccessful love in the same romantic, mystic tone, in an eclogue of 900 verses. It is a remarkable fact, that several distinguished Portuguese poets composed at the same time in the Castilian language, if they wished to sing of great subjects, for instance, Franc. de Sà de Miranda (*Obras*, Lisbon, 1784, 2 vols.; earlier, 1560, 1569 and 1614), who died in 1558. His two comedies *Os Estangeiros* and *Os Villalpandios* are contained in the second volume of the edition of 1784; but he distinguished himself more in lyric and didactic poetry. Ant. Ferreira, whom the Portuguese call their *Horace*, still more successfully imitated the ancients in the epistle. He died in 1569. His *Poemas Lusitanos* appeared in Lisbon, 1598, 4to, and the most recent edition, Lisbon, 1771, 2 vols. His tragedy *Castro* (Ines de Castro, q. v.), in vol. ii. of the edition of 1771, is formed after the Greek model, and Sismondi prefers it to the Italian tragedies then existing. They were followed by Pedro de Andrade Caminha (*Poesias*, recent edition, Lisbon, 1791), and Diego Bernardes Pimenta (*Rimas Varias ao bom Jesus*, &c., Lisbon, 1594; *O Lima, em o qual se contem as suas Eclogas e Cartas*, Lisbon, 1596, and *Flores do Lima*, Lisbon, 1596), who died in 1596. Sismondi compares him to Marini. The most celebrated of all Portuguese poets is Luis de Camoens. The best edition of his poems was published under the care of Thom. Jos. de Aquino and Fern. Lobo Surrupita (*Obras de L. de Camoens, Principe dos Poetas de Hespanha, Seg. Edic. Lisb. Na Offic. de S. Th. Ferreira*, 1782 and 1783.) It contains a preliminary discourse, the life of the poet, an index, various readings and stanzas, in 4 vols., 12mo. A pretty edition of the Lusiad, in 16mo, appeared at Coimbra, from the printing-office of the university, in 1800, 2 vols., with two engravings, the life of the poet, an index, various readings, &c. The first edition of the Lusiad appeared at Lisbon, 1572, 4to; his *Rimas Varias*, with a full commentary by Manoel de Faria e Souza, Lisbon, 1685, 1 vol. fol.; the third and fourth volumes in 1688, and the Commentary on the Lusiad, Madrid, 1639, 4 vols. folio. Another commentary is that of dom Manoel de Faria Severin, in the *Obras de Camoens* (Lisbon, 1720); a third is by Manoel Correa (Lisbon, 1613, 4to), and *Obras do grande L. de Camoens* (Lisbon, 1720, folio); a fourth by Ignacio Garcez Ferreira, *Lusiade Illustrata com varias Notus* (vol. i., Naples, 1731, 4to; vol. ii., Rome, 1732, 4to.) The hero of Camoens's epic is his country. It breathes the most intense patriotism, a noble pride and an enthusiastic feeling of love, animated by a powerful imagination. This work is the noblest monument of Portuguese greatness, attractive to every who cherishes patriotic feelings and a love of glory. Several sonnets of Camoens and other productions (*Rhytmas, Cançaos*, t. ii.; *Eclogas*, t. iii.; *Comedias*; *El Rei Seleuco*; *Os Amphitrioes* and *Filodemo*, with *Fragmentos* and *Obras attribuidas a Luis de Camoens*, t. iv.), breathe the spirit of a great and deeply stirred soul. In his dramatic attempts, his countryman Gil Vicente, whom the Portuguese call their *Plautus*, and who died in 1557, was his model. The collection of the dramatic works of Gil Vicente, who preceded the Spanish and English dramatists, and whose fame spread all over Europe, so that Erasmus learned Portuguese, in order to read this pioneer of the modern drama in the original, appeared at Lisbon, 1562, folio (*Copilaçam de todas las Obras de Gil Vicente, a qual se reparte em cinco Livros.*) On the model of Gil Vicente, rude as his works were, Lope de Vega and Calderon formed themselves. In Portugal itself, dramatic poetry was neglected. The ruling taste, unfortunately, was pleased only with pastorals. Franc. Rodrigues Lobo brought out tedious pastoral romances, in which, however, some ballads and canzoni breathe a true spirit of poetry; his epic Nuno Alvarez Pereira, High Constable of Portugal (*O Contestabre de Portugal, Poema heroico*, Lisbon, 1610, 4to) is only rhymed prose; *Eclogas* (1605, 4to); *A Primavera* (1619, 4to); *O Pastor Peregrino* (1608, 4to); and several others. Yet he was the first who showed the purity, tenderness and harmony of which Portuguese prose is capable. The merits of Jeronymo Corte Real are higher, as shown in his *Naufragio, o lastimoso Successo da Pardiçaõ de Manoel de Sousa de Sepulveda e D. Leonor de Sa, sua Mulher* (Lisbon, 1594, 4to.) This poet also sung the famous siege of Diu, valiantly defended by Mascarenhas; he himself was a brave soldier (*Successo do segundo Cerco de Dio, Poema*, Lisbon, 1574, 4to.) He and Lobo showed to Portuguese historians the way in which Joao de

Barros, a celebrated politician of the time of John III. (died 1571), whom Portugal calls her *Livy*, first acquired distinction. His *Asia* or *Dos Feitos, que os Portuguezes fizerao no Descobrimento e Conquista dos Mares e Terras do Oriente* (Lisbon, 1552, folio; second edition, Lisbon, 1553; third edition, Lisbon, 1563; fourth edition, with notes and maps, by J. B. Lavanha, Madrid, 1616, folio), is an important work. Diego de Couto has continued it in his *Asia Portugueza*, which comprises the whole in 14 vols., folio, 1552—1615. Also Fernao Lopes de Castanheda, in his *Historia do Descobrimento e Conquista da India pelos Portuguezes* (Coimbra, 1552—1561, 8 vols., folio); Ant. Bocarro, and the famous Portuguese hero Afonso de Albuquerque, in his *Commentarios*, published by his son (Lisbon, 1557, folio); Damiao de Goes (translator of the *Cato major* of Cicero), in his *Chronica do Folic. Rey D. Emmanuel* (p. i.—iv. Lisbon, 1565—1567, folio); and *Chron. do Principe D. Joam II.* (Lisbon, 1567, folio): and in his short Latin writings *De Moribus Æthiopum*, &c. (in P. Martyr's work *De Rebus Oceanicis*, (Cologne, 1574, third edition), have described the Portuguese heroes. The history of king Emmanuel by the bishop Jeronymo Osorio, who died 1580 (Lisbon, 1571), is esteemed on account of the tolerant views of this prelate. Bernardo de Brito afterwards wrote his *Monarchia Lusitana* (1597 and 1609, folio); also his *Elogios dos Reis de Portugal* (Lisbon, 1603, 4to). But as he began with the creation of the world, he had not proceeded to the actual foundation of the Portuguese state, when he died in 1617; his style is manly and simple. The voyages of discovery of the Portuguese missionaries and other Portuguese also furnished abundant materials to the Portuguese literature; for instance, the Travels of John Fernandez, from cape Arguin into the interior of Africa, in 1445; of Alf. de Paiva and Joan de Covilham, whom John III. sent, towards the end of the fifteenth century, as ambassadors to the (so called) Prester John, king of Abyssinia, and to India; yet many of these narratives are still in manuscript.—Respecting the historical literature, see *Biblioth. Histor. de Portugal e seus Dominios Ultramarinos*, &c., with notes by Arco do Cejo (Lisbon, 1801). At that time the power of Portugal sunk under Spanish despotism, and with it the Portuguese literature (in the seventeenth century). A voluminous writer, Manoel de Faria e Souza (1590 to 1649), commented on Camoens, without taste and spirit, but with an abundance of erudition; he published *Fuente de Aganippe, e Rimas varias* (Madrid, 1644—46, 7 vols.), and *Europa Portugueza* (3 vols., folio, Lisbon, 1675), in the Castilian language, and was considered for a long time a good critic in Portugal. His historical work shows a faulty taste, and, whilst he is anxious to exhibit every where his knowledge, wit, and eloquence, he abuses the talents which he actually possessed. Among his sonnets some are distinguished by feeling and grace. Among other poets is the inventor of a sort of elegiac compositions, called *saudades*, the famous lawyer Ant. Barbosa Bacellar (who died in 1663). The prose writer Jacinto Freire de Andrade is distinguished by his *Vida de D. Juão de Castro, Viso Rey da India* (Lisbon, 1671, second edition, folio), and by his comic poems. This biography, translated into several languages, is considered, by the Portuguese, a model of a pure and noble historical style. Violante do Ceo, a Dominican nun, published *Rimas* (1646) and *Soliloquios* (1668). She, as well as some others, such as Jeronymo Bahia, are too artificial. The sonnets of Franc. de Vasconcellos, who was born in Madeira, and the sacred songs of the Brazilian Andre Nunes de Silva, are in a simpler style. In the eighteenth century, the literature of Portugal seemed to sink entirely with the decay of the state. In order to give it some support, the government founded the academy of the Portuguese language in 1714, and the academy of history in the same year. But the Jesuits and the inquisition permitted no talent to develop itself freely. Under Pombal's powerful government (1750—1777), the national feeling rose once more. He established, indeed, a censorship; but this was intended chiefly for political writings; he himself was a great friend to scientific pursuits. Under Joseph I. the whole school system was reformed, and an institute for the education of young noblemen was established. The rupture with Rome, then existing, was wisely taken advantage of for this purpose. The traces of independent thinking yet to be met with are chiefly derived from that time, when, among others, the great theologian Ant. Pereira was very active. The renovation of the university of Coimbra also belongs to this period, and several good works then appeared. After the death of Joseph, the enemies of intelligence again raised their heads, yet without being able to destroy every thing. On the contrary, an academy of sciences was founded in 1779, by the influence of the duke of Braganza, which consists of three classes. One man, of great talents and accomplished taste, distinguished himself in the first half of the eighteenth century—general Franc. Xav. de Meneses, count of Ericeyra. He corresponded with Boileau, whose *Art Poëtique* he had translated into Portuguese verse, and published, among several other writings, an epic poem, the *Henriqueida*, or the Foundation of the Portuguese Monarchy, by Henry of Burgundy (Lisbon, 1741). It was intended to be more regular than the Lusiad, but Boileau's school was unable to inspire the count with the ardent and chivalric spirit of Camoens. Another poem of this period, by José Basilio da Gama, called *Ouraguay* (Lisbon, 1769), commemorating the conquest of Paraguay, is much esteemed. The inclination of the people of Lisbon now turned again to the theatre which had been so long neglected. We shall say a few words on the Portuguese theatre hereafter. Among the recent Portuguese poets, several have contributed to banish the ancient pastoral style, and to alter the taste of the people for poetry of an Oriental character, by good translations, particularly from the English; e. g. two Brazilians, Claude Manoel da Costa, and Antonio Diniz da Cruz e Silva, after whose death appeared his *Obras*, &c. (Lisbon, 1807), containing imitations of British poets, and *Odes Pindaricas posthumas de Elpino Nonacriense* (Coimbra, 1801); also Almeno, translator of the first four books of Ovid's Metamorphoses into Portuguese verse, author of *Poesias de Almeno, publicadas por Elpino Duriense* (Lisbon, 1805); Francisco Manoel, who was born in 1734, and after 1778, when he escaped from the inquisition, passed his life in Paris, where his lyrical poems appeared in 1808, and where he died in 1819; and several others. One of the most fertile and most popular poets was Manoel Maria de Barbosa du Bocage, who died in 1805, in the Lisbon hospital. Of his *Rimas*, the second edition appeared in Lisbon, 1800, in 3 vols. (the third, 1804, under the title *Poesias*, dedicated to the countess of Oyenhausen). This lady, a daughter of the marquis of Alorno, has translated Wieland's Oberon, but not yet published it. Among the poets yet living, José Monteiro da Rocha and Mozinho d'Albuquerque are esteemed. There are among the Portuguese several successful *improvvisatori*. The *Parnasso Lusitano* (published in Paris) facilitates an acquaintance with Portuguese poetry. Since 1827, a Portuguese periodical has been published in Paris, called *Novos Annaes das Sciencias e das Artes*, in which a fragment of a great Portuguese poem, yet in manuscript, is to be found—*Branca ou a Conquista do Algarve Blanca*. There can be no question respecting the state of Portuguese literature at this moment.

In no arts have the Portuguese so distinguished themselves as in music, in dramatic performance and in dancing. In music they come near the Italians, in the theatrical dance to the French. King John, just before he left Portugal, established an academy of painting under the direction of the painter José da Cunha Taborda, but it came to an end when the French took possession of Lisbon. Before the reign of king Joseph, there existed no national Portuguese theatre, if we do not apply this name to the absurd productions called sacred pieces (*autos sacramentaos*) which were as barbarous as the dramas of other nations in the middle ages. Private persons undertook to establish a theatre under Joseph, and Pombal did much to support them. In 1771, a royal decree declared the profession of actors respectable, and many excellent actors soon distinguished themselves. But, after the death of Joseph, the queen thought herself in conscience bound to prohibit the appearance of women on the stage. Dramatic writing, of course, immediately relapsed. It had, indeed, consisted, in this period, of little more than translations from foreign works. King John permitted again the appearance of actresses. At present, there is hardly one actor at Lisbon who can be compared with a second rate actor in other large cities of Europe. Lisbon has at present five theatres—1. San Carlos, the largest. In 1822, government appropriated 15,000,000 reis for its support. 2. Rua dos Condes, for the support of which government contributed in 1822, 10,000,000 reis. 3. and 4. Salitre and Bairo Alto, smaller theatres, where Portuguese and Spanish pieces are played alternately. 5. Boa-Hora, at Belem, where Portuguese farces only are played. A circus adjoining the theatre Salitre serves for bull-fights. The theatre of San-Joao, at Oporto, is the second in the kingdom. Women were allowed to appear on the stage here before they were allowed so to do in Lisbon. In 1822, this theatre received from government 10,000,000 reis. Setubal (St Ubes) has a large theatre, but no permanent company. Madeira has a beautiful theatre at Funchal, and a society, calling themselves *socios do bom gosto*, support a theatre. The tragedy, so neglected in Portugal, is here much cultivated. Brazil possesses several theatres, of which some may be compared with San Carlos. The first Brasilian theatre, San-Joao, at Rio Janeiro, was opened October 11, 1813. There are several others at this place. Bahia has a brilliant theatre since 1810. Pernambuco has also one. The Italian opera has always been the chief theatrical attraction in Portugal. Joseph was enthusiastically fond of music, and Pombal nourished this inclination, in order to be left more at liberty in affairs of government. Joseph had several royal theatres for the opera. That in Lisbon cost more than any similar establishment in Europe. The first musicians and singers were attracted by large salaries. Among the performers who sang in the royal chapel, Egizieli and Caffarelli had salaries of 72,000 francs, though they performed but two or three months in the year, and, after a few years, received considerable pensions for life. The theatre on which the operas were performed, was situated on the Tagus, and when the curtain in the back ground was raised, the sea was seen in its splendour. After the banishment of actresses, the opera also suffered; but it revived, and Italian voices, like those of Crescentini, Naldi, Mombelli, Mad. Catalani, Gaforini, &c., were heard. The ballet and scenery were equally attended to. But the invasion of the French, and the subsequent political events, caused the decline of the opera. At Oporto it flourished longer. The Jesuits formerly established a singing school for negroes near Rio Janeiro, on their estate, called Santa Cruz. When the order was abolished, this district fell to the crown, and Santa Cruz became one of the residences of the court, after the removal of the royal family to Brazil. When the court for the first time attended mass in the church of St Ignatius de Loyola at St Cruz, the king was astonished at the perfection with which the sacred music was executed by negroes of both sexes, who had formed themselves on the rules formerly introduced by the Jesuits. The king now ordered the establishment of elementary musical schools, and very skilful singers and musicians of both sexes were soon formed; the first performers on the violin, bassoon and clarionet were negroes, and among vocal performers, two negresses were distinguished. In 1826, the whole orchestra of the chapel consisted of negroes. The late emperor Pedro, an enthusiastic admirer of music, had several operas composed by the brothers Marcos and Simao Portugal (more known under the name of *Portogallo*), and performed by negroes only, who played with universal applause.

PORTUMNUS, among the Romans; the god of harbours; the same as the *Melicerta* or *Palæmon* of the Greeks. He had a small temple on the Tiber, and the *Portumnalia* were yearly celebrated in his honour. He bore a key in his hand as an emblem of his office.

POSEIDON. See *Neptune*.

POSEN, or POSNANIA, grand duchy, one of the ten provinces of the kingdom of Prussia, composed, by an act of the congress of Vienna (1815), of a part of South Prussia and of the district of Netz. It borders on the Prussian provinces of Silesia, Brandenburg and West Prussia, and on the kingdom of Poland. It has a superficial area of 11,500 square miles, with a population (in 1828) of 1,064,000, of which 50,000 are Jews, 150,000 Germans, and the rest Poles; there are about 253,000 Protestants. The province is divided into the two circles of Posen and Bromberg. The face of the country is, for the most part, level, and, in general, is fruitful, and under excellent cultivation. The principal rivers of the province are the Warta and the Netze, which flow into the Oder; the Vistula, with which the Netze is connected by a canal, also touches the north east boundary. (See *Prussia*.) Posen was formerly a palatinate of Poland; it fell to Prussia by the partition of Poland, in the last century. (See *Poland*.) The capital, Posen (in Polish, *Poznan*), lies on the Warta, in lat. 52° 19′ N., and lon. 17° 22′ E.; population, 24,598, of whom 4000 are Jews.

POSIDONIUS; a stoic philosopher (see *Stoics*), born at Apamea, in Syria, about B. C. 103, called, also, the *Rhodian*, because he was the scholar of Panætius of Rhodes, and was himself a teacher at Rhodes, after he returned from his travels. He taught the stoic philosophy with great applause, was at the same time a statesman and one of the Prytanes, and went, when fifty years of age, as an ambassador to Rome. The most distinguished Romans were his scholars, and Cicero himself was initiated by him into the stoic philosophy. He wrote many works, which are now lost. Jan. Bake collected the fragments—*Posidonii Reliquæ, etc.* (Leyden, 1815). He distinguished the ideas of God, fate and nature more accurately than the other stoics.

POSILIPPO. See *Pausilippo.*

POSITION. See *Prosody.*

POSSE COMITATUS, in law; the power of the county or the citizens who are summoned to assist an officer in suppressing a riot or executing any legal process, which is forcibly opposed: the word *comitatus* is often omitted, and *posse* alone used in the same sense.

POSSELT, ERNEST LOUIS; a historical and political writer, born at Durlach, in Baden, in 1763, studied at Gottingen and Strasburg, and, in 1784, became professor of history and rhetoric, in the gymnasium at Carlsruhe. In 1791, he was made bailiff of Gernsbach, near Rastadt, and died in 1804, in consequence of a fall from a window. His principal works are *Bellum Populi Gallici adversus Hungariæ Borussiæque Reges*, &c. (1793); his *Histor. Taschenbuch für die neueste Geschichte*; and *Geschichte der Deutschen*, continued by Politz, &c. He also edited the European Annals (in German) from 1795, and the *Allgemeine Zeitung*, which he established in 1799.

POSSESSED (*demoniacs*). The epileptic, hysteric and frantic patients were so called in ancient times, and it was believed that one or several devils dwelt in such unfortunate persons. Delusion, in connexion with monkish knavery, produced miracles; stupidity and malignity, *autos da fé.*

POST-CAPTAIN. See *Captain.*

POSTERN, more frequently called a *sally port*, is a small gate generally made in the angle of the flank of a bastion, or in that of the curtain, or near the orillon, descending into the ditch, by which the garrison may march in and out unperceived by the enemy, to relieve the works, make sallies, &c.

POSTS; one of the most effective instruments of civilization, to be ranked with the art of printing and the mariner's compass. We find the first posts in the Persian empire. Darius I., son of Hystaspes, caused couriers, with saddled horses, to stand ready at different stations throughout the empire, situated one day's journey from each other, in order to receive reports from the provinces without delay. Augustus established an institution in the Roman empire similar to the modern posts. The name of *posts* is said to be derived from the Latin *positus*. (placed), because horses were *put* at certain distances, to transport letters or travellers. In the ninth century, there existed in Germany, France and Italy, messengers who travelled on horseback, destined, however only for the service of government; and this establishment, besides, was of little duration. Carrier pigeons (q. v.) are used in the East, and became known in Europe through the crusaders, but seem never to have been introduced in the latter part of the world to any extent. When commerce began to flourish, the larger commercial cities, particularly in Germany, began to establish mounted messengers and stage-coaches. Travelling merchants and butchers (who ride about in the country to buy cattle) used to take charge of letters. In the beginning of the thirteenth century, the university of Paris maintained pedestrian messengers, who, at certain times, took charge of letters and money for the students, collected in that city from almost all parts of Europe. Louis XI. established for his own use mounted messengers, and, by an edict of June 19, 1464, instituted post stations, at intervals of four French miles, on the chief roads of France. Charles VIII. extended this institution, which existed until 1524, for the sole use of the court. When the Spaniards discovered Peru, in 1527, they found messengers placed at short distances on the road from Cusco to Quito, in order to transmit with speed the orders of the Inca. In Germany, the first post was established in Tyrol, in the latter half of the fifteenth century, by Roger I. count of Thurn, Taxis and Valsassina. His son established another from Brussels to Vienna, in 1516, by the wish of the emperor Maximilian I. In 1522, a post was established between Vienna and Nuremberg, where the diet sat, on account of the war with Solyman II.; but it ceased with the war. Charles V. was anxious to have news as quickly as possible, on account of the vastness of his states, and caused Leonard of Thurn and Taxis to establish a permanent riding-post from the Netherlands through Liege, Treves, Spire and Rheinhausen, through Würtemberg, Augsburg and Tyrol to Italy. In 1543, Leonard was appointed postmaster-general of the empire. After the death of Charles V., the members of the empire were unwilling to allow a Spanish-Netherlandish post (such was that established by Charles V.) in their territories; yet Ferdinand I. confirmed Leonard in 1563. In 1595, he was appointed postmaster-general of the empire, in opposition to the wishes of the members; but several of them, having already established posts in their dominions, refused to acknowledge the exclusive privileges claimed by the imperial post. In 1615, Lamoral of Taxis was actually infeoffed with the imperial post, as an imperial fief. Ferdinand II. extended this grant so as to make it descendible to the nieces of Lemoral, and a regular post now went every week from the imperial court, and also from Rome, Venice, Milan, Mantua, &c., to Augsburg, and thence to Brussels and back. The post remained as long as the empire existed, one of its many ill defined and unwieldy institutions, in which private or petty interest was allowed to stand in the way of the public welfare. The post was actually made a regular point in the *Wahlcapitulationen*, the stipulations between the electors and the candidate for the imperial dignity. The imperial posts were restricted, and the emperor himself excluded the Thurn and Taxis post from several of his dominions. In a country where so many small territories had their own posts, it was natural that they should remain in a very bad condition, and it is only in very recent times that they have become better; yet, generally speaking, the letter-mail is not transmitted quickly. It was wise in the United States to intrust the whole post establishment to the general government, thereby avoiding the difficulties which have interfered with the beneficial operation of the institution in Germany. There are at present post establishments of different kinds in Germany. Austria, Prussia, Bavaria, Hanover, the kingdom of Saxony, Baden, Brunswick, Mecklenburg-Schwerin, Holstein-Oldenburg, Holstein-Lauenburg and Luxemburg have exclusively their own posts; but, in Würtemberg, Hesse-Nassau, in the states of the Saxon-Ernestine line, in both the Schwartzenburgs, Hohenzollern, Waldeck, Lippe-Detmold, and the territories of the princes of Reuss, the post is left to the house of Thurn and Taxis as a fief. In some other states, the Thurn and Taxis post is founded upon a regular compact. The whole Thurn and Taxis post establishment is under the superintendence of the postmaster-general at Frankfort on the Maine. The petty principality of Lichtenstein has no post. The Thurn and Taxis post extends over an area of 25,000 miles with 3,753,450 inhabitants. We will mention here a few items, either peculiar to Germany, or otherwise interesting. The stage-coaches, almost all over Germany, are united with the post-offices, and are called *Fahrende Posten* (driving posts). With the many disadvantages connected with this state of things, there is at least one advantage, that, by these posts, which travel, of course, slower than letter-mails, parcels, &c., may be sent as safely as letters. In several German states, letters can be "recommended," when they are specified on the way bill, for which higher postage is paid. If any person wishes to communicate something to all the post-offices of a certain line (for example, an inquiry after an important parcel), an open paper may be sent by mail, which is read and forwarded by all the respective postmasters. *Estafettes* (q. v.) may always be had. In some states, it is permitted to pay a sum, not beyond a certain amount, to any postmaster, and to send the receipt therefor to any other part of the state, where the postmaster who receives it is obliged to pay the sum. For the remittance of small sums this is very convenient, particularly for the poorer classes. A receipt for the delivery of any letter purporting to contain a particular sum, may always be had, and this sum is paid, if the letter is lost in the regular course of transportation. If the letter, however, should arrive in good order, and no money be found in it, the government would not be answerable in consequence of such a receipt. But if a man goes to the post-office with an open letter, and encloses a certain sum therein in the presence of the postmaster, the receipt of the government makes him liable, at all events, for the safe transportation of the money.

Something was said, in the beginning of this article, respecting the origin of the posts in France. During the reign of Louis XIII., 1610—30, the French system of posts received a more regular form from the establishment of a controller-general of posts. They, as well as the postmasters named in 1630, received the revenue, till at length the minister Louvois, in the reign of Louis XIV., 1676, farmed out the posts to a certain Patin, and committed to him the regulation of the postage. In 1688, when the post was farmed out for the third time, the revenue amounted to 1,400,000 francs (a franc is about 10 pence), and, in 1695, when it was sold by auction unconditionally, to 2,000,000 francs. In 1733, this revenue amounted to 3,000,000, principally because the regency, in 1719, had abolished the academical couriers (on which account the university at Paris had assigned to it, from the revenue of the post-office 300,000 francs yearly, which was paid to it till the beginning of the revolution). In 1738, the post establishment was taken under royal management, in order that the government might find out the true income. The result of this was an increase of the sum at which it was farmed out. In 1786, when it was leased for the twenty-third time, the sum paid amounted to 10,800,000 francs. At the expiration of the last lease, in 1791, when the establishment reverted to the king, it produced a clear income of more than 11,000,000 francs. From 1814 to 1822, the average yearly returns of the letter posts were 21,890,000 francs: now, these returns amount to 26,560,000 francs, which is the postage of 60,000,000 letters. Besides these, there are letters and packets free of postage, so that the whole may be reckoned at 110,000,000, without including 25,000 sheets of Parisian periodicals, sent daily to the departments, and 25,000 others which are published and circulated in the departments. The revenue from the post-office of Paris is yearly 4,310,000 francs. 40,000 letters are sent daily from Paris into the interior and abroad, of which 28—30,000 pay postage, and from 10 to 12,000 are free; and 30,000 arrive daily, of which 18,000 pay postage; thus 25,550,000 letters yearly arrive at and are sent from Paris. From the time of Louis XV. till the time of the revolution, general intendants were almost always placed at the head of the post-office department, principally chosen, as in Spain and Italy, from men of the highest rank, because their place was always near the king. For the superintendence of the letter-post and postmasters, a particular council was appointed, under the presidency of the head of the department, and consisting of three general inspectors. Since 1819, the letter and extra posts (*postes relais*), the last of which were left to the postmasters for their own advantage, have been united under the same department. A general director is chief of the whole post system, as in all the important branches belonging to the ministry of finance. In every one of the French departments is a post-inspector; every post-office has a director, a controller, and such number of assistants as circumstances may require. The postmasters stand, indeed, in respect to extra posts, under the general director, but have a particular council of direction, consisting of three general inspectors. The management of the post department is very simple, and the system of accounts worthy of imitation. The course of business is very much facilitated by the *Instruction générale sur le Service des Postes*, published in 1808, and still in force. Till the revolution, which took away all privileges, the postmasters enjoyed great immunities, with regard to landed property, the quartering of soldiers, the military duties of their sons, &c. They were under the ministry of the royal household, had their commissions signed by the king, and enjoyed considerable salaries. For these reasons, they were willing to transport the mail at first for the trifling price of three, afterwards of ten sous, per pound for a stage. The national assembly gave them for their lost privileges, under the name of *salary*, a small compensation of 2—400 francs. Afterwards, in October, 1823, the postmasters received thirty sous for the horse for the transportation of the mail and public expresses; likewise for the couriers twenty-five sous. All the mails in France are accompanied by responsible couriers (*service des malles*); they likewise transport money and individuals, each of whom pays two francs a stage for a place, and may carry fifteen pounds of luggage. The directors-general of the posts make contracts with the postmasters for the transportation of the mail and public expresses, but are not bound to keep them strictly, as it is only the extra posts to which the postmasters have an undisputed claim. Couriers are of two kinds, great and small. The first traverse the principal routes, as through Lyons to Italy, through Bourdeaux to Spain and Portugal, through Strasburg to Germany, &c. The route of the last is through the interior, and they are dependent upon private enterprise. The couriers of the great post have covered carriages, with three horses. Since the return of Louis XVIII. to France, the carriages of the couriers upon the great routes have become much handsomer and more commodious. This was owing to the suggestions of the king, who had compared their tasteless structures with the light construction of the British. This gave rise, it is true, to complaints from the owners of the old carriages against the postmasters, which were even brought into the chamber of deputies, but finally settled by an agreement concluded September, 1822. Since 1791, the posts in France have been much more regular and expeditious. The postage has also, in the course of time, undergone important changes. Under Louis XIV., the farmers of the post regulated it at will; but as soon as the post system was taken under the royal management, an end was put to the system of extortion, as is apparent from the earliest postage rates, namely, those of the years 1701 and 1703. The present rates were established by the decree of 1806. In proportion to the postage of 1759, there is a considerable increase in particular charges, amounting to a third in the case of single letters, but the excuse for this is found in the more than trebly increased expenditure. Yet the French postage upon a single letter is more reasonable than that of any other country; for the highest price of such a letter to any part of the kingdom amounts but to one franc (10 pence). The increase, however, in the price of letters with their increasing weight is not so reasonable; for the ratio in the French system is the highest of all, higher in proportion than the English, and "recommended" letters must even pay double. On the contrary, France offers an example worthy of imitation in the rates of conveyance for printed matter. Newspapers sent into the interior pay but four centimes a sheet; those sent out of the kingdom eight. Other printed matter pays five centimes in the first case, and ten in the second. These charges on printed matter must be paid upon delivery. Patterns of goods pay one-third postage. Quite contrary to this is the Prussian post system of 1824, which prohibited the carrying of printed matter in the letter mails, and transferred it to the government baggage waggons. It imposes, moreover, a charge of triple letter postage on packages of two ounces weight, and of seven times letter postage on packages of two pounds weight. Postage upon money, since 1703, has been fixed at five per cent., without regard to distance. Since 1759, a small post has been established in the city of Paris, under royal regulation, to the great advantage of the Parisian public. From eight offices, in different parts of the city, the letters, as well of the great as the lesser post, are distributed by the letter-carriers, five times each day during the six cold months, and six times a day during the others. As to the inviolability of letters, it is known that every postmaster must take an oath to observe it; but letters are, in fact, often opened by the secret police. In 1825, the letters sent by commercial couriers from Paris to London were broken open. The answer returned to the complaints made was, that the right to send couriers was a simple permission, in consideration of which the government must have liberty to examine the contents of their letters. In the time of the French republic and consular government, the secrecy of letters was much more regarded. After the fall of the Villèle ministry (Jan. 1828), the government abolished the department intrusted with the unsealing of letters, and declared them inviolable. The coaches, or *diligences*, for the transportation of passengers and baggage, have always been private establishments, licensed, indeed, by the government, and paying a fixed tax to the state. Competition, therefore, has contributed much to their improvement. The most important undertaking of this kind is at Paris, *entreprise générale des messageries*. Besides *diligences*, there are *pataches*, a kind of travelling messengers, who receive travellers, and make short journeys, without changing horses, but likewise have licenses from government, and are obliged to pay a certain tax. In 1766, there went daily from Paris twenty-seven coaches, with 270 travellers, into the different provinces. Now there are 300 coaches, which carry more than 3000 passengers. Just before 1792, the last lease of the public coaches produced but 600,000 francs. Now the taxes on them alone amount to nearly 4,000,000 francs. In the above-mentioned year, fifty francs were paid for a seat in a carriage from Paris to Lyons, and the journey occupied ten days. Now the time does not exceed three days, and the price is seventy-two francs. The extra posts in France are particularly distinguished for their swiftness. This is owing, not to the goodness of the horses, but to the activity of the postmasters, the postilions, and the drivers. The postilion never thinks of sleep or rest. As soon as he gets in sight of his stopping-place, he gives a signal by cracking his whip, at which every thing is immediately got in readiness, so that he starts again in a few minutes. In France, the official regulations for extra posts are printed yearly, together with all the routes, and what is to be paid and to be observed at each stage; also the post charts, and all new changes.

The beginning of the English post system is first observed in the statutes of Edward III.; yet the supposition is not well founded that from that time the post was established as a public institution. Edward IV. placed post-houses at intervals of twenty miles; and, in the north, a military post was established to communicate as quickly as possible with the army during the Scottish war. This institution was indeed authorized by the reigning king, but it was probably owing to the king's brother Richard, who commanded the army. At what time, and under what conditions, the public were able to avail themselves of it, we have no certain knowledge. That this post, nevertheless, was, for a long time, very limited, and but partially used, is obvious from the fact that, not long before the reign of Charles I., merchants, tradesmen, and professional men, in the whole kingdom, resorted to less secure means of conveyance, or employed express messengers, at great expense, to carry their correspondence. The universities and principal cities had their own posts,—messengers who performed long journeys, riding or walking, and returned with the answers to the letters. In this manner the post was conducted, in Scotland, till a much later period. In 1543, a post existed by which letters were carried from London to Edinburgh within four days; but this rate of transportation, extraordinarily rapid for that period, lasted but a short time. After Camden, who was much employed by Elizabeth in her Scottish affairs, Thomas Randolph (in 1581) held the place of postmaster-general of England. James I. set on foot, under the superintendence of Matthew de Quester, a system for forwarding letters intended for foreign lands. Hitherto, this had been done by private persons. The foreign merchants settled in London preserved long after the privileges belonging to the place of postmaster for foreign letters. In 1632, Charles I., by a proclamation, forbade letters to be sent out of the kingdom, except through the post-office. In 1635, he established a system of posts for England and Scotland, which was conducted according to new and judicious regulations. All private and local posts were abolished, and the income of the post-offices was claimed by the king. This institution was under the direction of Thomas Witherings, who was removed in 1640, on account of notorious abuses. To him succeeded Philip Burlamachy, who was under the immediate control of the secretary of state. In 1630, Charles in connexion with Louis XIII. of France, established a post between London and Paris, from Dover to Calais, and from thence through Boulogne, Abbeville, and Amiens to Paris.

At the same time, the private post, which had existed between the countries, from Rye to Dieppe, was abolished. These arguments suffered, during the civil wars, many important interruptions, or were almost entirely annihilated. Yet no sooner was public tranquillity restored, than a commission was appointed, and a post system arranged, under the direction of the attorney-general, Edmund Prideaux, which became so profitable, that the posts could now be leased for £10,000, while before, the support of them had cost £7,000. The lessee still made so large profits that the common council of London looked upon him with jealous eyes. On the restoration, the system was retained with slight modifications. During the government of William III., acts of parliament were passed, which regulated the internal post system of Scotland; and, by the ninth act of queen Anne, the post system of England was arranged as it is at present.

The general post-office of Great Britain has jurisdiction of all which concerns the English and Scotch posts, and those going to the British colonies, excepting the East Indies, and the settlements in the South sea. Ireland has a separate post department. In all the cities, and in most of the large villages, postmasters and deputy postmasters are appointed. Their duty is to receive and despatch the mail, forward the letters to their place of destination, receive the postage, and send it at certain periods to the chief post-office. In order to ensure the observance of the different regulations which are connected with this department, and the fulfilment of the contracts for the transmission of the mail by carriages, on horseback, or on foot, seven inspectors travel on horseback through England and two through Scotland. Each of these has his particular district, in which he must watch over the regulation of the post. They correspond with the heads of the department in London. In England the number of postmasters amounts to 600, who are immediately connected with the chief post-office. In Scotland it is above 200. The regularity with which the post comes and goes, and the letters are received and distributed in Britain, is remarkable. The British have in this particular acquired a promptness worthy of being imitated, and which greatly contributes to the certainty and celerity of their commercial intercourse. No where is the inviolability of letters more respected than in Britain and the United States of America. Without an accurate acquaintance with the details of the British post system, it is not possible to obtain a conception of its present perfection. Mr Palmer's invention of mail-coaches has been found highly convenient and useful, not only for the safe and expeditious conveyance of letters, but also of passengers. Much praise is due also to the auxiliary institutions of the foot and horse posts, which complete the complicated machine. Postmasters are also established in British North America and the West Indian colonies, which regularly receive, once or twice a month, packet boats from Falmouth. Even in the seaports of the continent, of the Mediterranean sea, and South America, agents are appointed which receive British packet boats. In London there is the general and the twopenny post: in the first are the principal offices; that of the chief secretaries, receiver-general, accountant-general, &c. Besides these chief offices, there are in the city more than sixty houses where letters for the general post can be delivered. The number of the officers in the institution is 175, messengers and porters 35, letter-carriers 203, guides 270. The mail-coaches travel daily about 13,000 English miles. Twenty-two mail coaches go from London, and forty-five are employed upon the other routes. The first mail coach started for Bristol, August 2, 1784, and in 1786 they were in general use. In the district of the twopenny post, which includes in its circuit, London and the country within a distance of ten miles, there are 140 houses, where letters are received; the number of officers amounts to forty-eight; that of the letter-carriers to 359. The revenue from the post-offices throughout Great Britain, of late years, since the restrictions on intercourse with the continent have been removed, has averaged 1—1½ milion pounds sterling. Thus, for example, in 1828, the net income was 1,508,000, and, in 1830, 1,466,012 pounds sterling. The expenditure in 1828 was 702,418 pounds sterling. In 1801, the income was only 858,000 pounds sterling, although Britain possessed, even at that time, the commerce of the world. We perceive, from this comparison, how much the British trade has increased since 1815, for this trade is the great support of the post system. The postage in Britain is higher than in any other of the European kingdoms: but it is to be considered that the worth of money is less, and the wealth greater, than in other states. The rates of postage in Britain are, for any distance not exceeding 15 miles, 4d.

above 15 and not exceeding 20 „ 5 „
„ 20 „ 30 „ 6 „
„ 30 „ 50 „ 7 „
„ 50 „ 80 „ 8 „
„ 80 „ 120 „ 9 „
„ 120 „ 170 „ 10 „
„ 170 „ 230 „ 11 „
„ 230 „ 300 „ 12 „
„ 300 „ 400 „ 13 „
„ 400, for every 100, or part of it, 1 „

The post establishments of the other European states are either still in a very low condition, or are formed more or less upon the models of those already mentioned. The post establishments of Russia have been much improved in later times, compared with her other political institutions. They appear to have been formed on the model of the principal post establishments in North Germany. The postage is moderate, and has been gradually rather lessened than increased. By the late rates, a letter of an ounce weight pays two copecks for each 100 versts.* This is the rule up to 1500 versts. For any distance between 1500 and 3000 versts, only one copeck additional is paid. For any distance over 3000 versts, not more than fifty copecks are paid. Letters are sent in that immense empire 6000—7000 versts. For the sending of powers of attorney, exchange, and money documents, the postage is double that of an ordinary letter. For money and packets of value, which are transported badly, and generally upon baggage waggons, the insurance is, for a distance of 500 versts, half per cent., over 500, one per cent. For letters sent abroad the Russian postage is also very moderate. Although Russia is twice as large as all Europe, and numbers more than fifty million inhabitants, yet the revenue of the postage cannot be reckoned at more than between 5—600,000 dollars. There are five post routes: those of Moscow, Riga, Viborg, Archangel, and Poland. Post carriages, or *diligences*, are not to be found in Russia. The extra posts, however, are no where cheaper and more expeditious. An extra post-horse costs, for a verst, not more than two copecks. A journey of 4580 versts, for which eight weeks are employed, costs, including the expense of living, only about 220 dollars. He who wishes to make use of the extra post, must be authorized by a particular pass or order. Any one travelling with an extra post in any part of the country, will find a great convenience in wearing a uniform. In Denmark, the post is managed very much with a view to revenue, but is distinguished by no particular arrangement. The postage in Sweden and Norway is more moderate, and hence the income is much less than in the neighbouring state. In the Netherlands, posts were established by the ancestors of the princely Taxis house, and Leonard von Taxis held, even in 1543, the station of postmaster-general of the Netherlands. After the revolt of the Netherlands from the house of Austria, the post system of Britain appears to have been taken as a model. The French post system was introduced into Holland immediately after its incorporation with the French empire. So it still continues, and with very little alteration, since the change of Holland into the kingdom of the Netherlands. Italy appears to have been the cradle of the system of posts. Even under the emperor Augustus, it was in the most flourishing condition that it had enjoyed in ancient times. It was then constituted principally with a view to obtain intelligence from the army. Messengers and couriers were employed, the last of extraordinary swiftness. Thus, for example, the emperor Augustus several times received dispatches from Sclavonia in four days; and Tiberius was so much accustomed to this expedition, that he indignantly threw away his dispatches if they were more than twenty days from Asia, fifteen from Europe, ten from Africa, five from Sclavonia, and three from any part of Italy. Under him, and also under the succeeding emperors, extra posts were used. The head of the post department was the commander of the pretorian guards. From a manuscript in the library of the king of France, it appears that the German emperor Charles V. paid the postmasters in Italy. Simon von Taxis was general post director at Milan, and resided in the imperial palace, where every thing was kept in readiness for the post service. In Milan and the neighbouring places a foot post was established, which seems to have been the occasion and the model of the small post now established in Paris. Until the union of the kingdom of Italy with the old French empire, the Italian post establishments were well ordered; but they attained, from time to time, a higher degree of perfection, by being formed on the French plan. Since 1815. the post system in the Lombardo-Venetian kingdom, in Tuscany, Parma, and Modena, has been instituted more according to the Austrian model, still retaining, however, the French basis. In the other states of Italy, the posts, with some modifications, continued as before. The letter and extra posts are well organised in Italy. The privacy of letters was even so much respected, that, by the criminal code of Milan, the breaking of a seal was punished with death. In Switzerland, each canton has, according to the ordinances of the diet of 1803, the regulation of the post; consequently, it has its own post establishment. They are variously managed, and of various merit. A general system might make the postage cheaper, but it cannot, even at present, be called dear, as it has never been made an object of financial speculation. The absence of a general system for all the cantons has been, in some degree, compensated by agreements which have introduced some uniformity in the management of the post systems. There are no extra posts any where in Switzerland, and as all the regulations which have hitherto been made on this subject, have remained ineffectual, it has been supposed that the interest of inn-keepers and keepers of carriages for hire, has prevented their success. In Spain and Portugal, the post establishments are still in a very low condition, although a *correo mayor* presides over them as director-general. Only in European Turkey are they entirely in their infancy. For centuries, no change has been made, excepting that the grand signior maintains mounted Tartars for the public service, who must forward with celerity his dispatches, and those of all the public authorities. In earlier times, there were public messengers who travelled on foot, but had the privilege of commanding those on horseback, whom they met, to dismount, in the name of the grand signior, and to use their horses to the place of destination, or to exchange them if they met others farther on, with less tired horses.

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* The amount of two copecks, or of the double copeck, in weight of copper, is a little more than a halfpenny. A verst is about two thirds of an English mile.

In the English colonies in North America, a post-office was projected as early as 1692. A patent was laid before the Virginia assembly for making Mr Neal post-master-general of Virginia and other parts of America. The assssembly passed an act in its favour, but it had no effect. It was impossible to carry it into execution on account of the dispersed situation of the inhabitants. The first office in the colonies was established in 1710, by an act of parliament, "for establishing a general post-office for all her majesty's dominions." The postmaster-general was to be "at liberty to keep one chief letter-office in New York, and other chief offices at some convenient place or places in each of her majesty's provinces or colonies in America." After the breaking out of the revolution, this department came of course under the control of the congress of the confederacy. The constitution of the United States, adopted in 1789, gave the exclusive power of establishing post-offices and post-roads to congress, thus preventing the difficulties which would have resulted from leaving this department to the several states. There is at the seat of government of the United States a general post-office under the direction of the postmaster-general, who is appointed by the president, and appoints two assistants, and such clerks as may be necessary for the performance of the business of his office. He establishes post-offices, and appoints postmasters at all such places as appear to him expedient on post-roads established by law. He instructs the postmasters, provides for the carriage of the mail, and directs the routes.

Rates of Postage in the United States of America. On a single letter, composed of one piece of paper, for any Distance not exceeding 30 miles, 6 c.

above	30	and not exceeding	80	„	10	„
„	80	„	150	„	12½	„
„	150	„	400	„	18¾	„
„	400			„	25	„

A letter composed of two pieces of paper is charged with double these rates; of three pieces, with triple; and of four pieces, with quadruple. One or more pieces of paper, mailed as a letter, and weighing one ounce, shall be charged with quadruple postage, and at the same rate, should the weight be greater. For every letter lodged at the post-office to be delivered at the place where it is so lodged, one cent is charged.—*Newspaper Postage.* For each newspaper, not carried out of the state in which it is published, or if carried out of the state, but not carried over 100 miles, one cent; over 100 miles, and out of the state in which it is published, one and a half cent. For magazines and pamphlets, if published periodically, distance not exceeding 100 miles, one and a half cent per sheet; distance over 100 miles, two and a half cents per sheet; if not published periodically, distance not exceeding 100 miles, four cents per sheet; distance over 100 miles, six cents per sheet. Each printed pamphlet or magazine which contains more than twenty-four pages, on a royal sheet, or any sheet of less dimensions, shall be charged by the sheet; and small pamphlets, printed on a half or quarter sheet, of royal or less size, shall be charged with half the amount of postage charged on a full sheet. The postage on ship-letters, if delivered at the office where the vessel arrives, is six cents; if conveyed by posts, two cents in addition to the ordinary postage.

The United States are probably the only country in which posts exist without laws prohibiting private persons to carry letters, and the quantity of letters, forwarded by private conveyance between certain places is very great. Only regularly established conveyances, as common stages, waggons, &c., are not allowed to take sealed letters. Great numbers of letters pass between America and Europe in the lines of packets, particularly those which run between New York and Liverpool and Havre. The number of letters delivered by these packets into the New York post-office, sometimes amounts (when several arrive together in consequence of a continuance of contrary winds on the coast) to many thousands in one day. Other places, as Philadelphia, have also lines of packets to Europe.

POSTULATE (from *postulo*, to demand); in mathematics, a problem which it is self-evident can be solved; as, for example, to draw a line about a point, so that every part of the line shall be at an equal distance from the point. In the critical philosophy, postulates of practical reason are theoretical axioms, not susceptible of demonstration, to the reception of which we are determined by practical ideas, or certain practical laws existing unconditionally, and *a priori*. Man is free; man is immortal; there is one God; are, in the Kantien philosophy, the three postulates of pure practical reason.

POTASH, OR POTASSA, derives its name from *ashes*, and the pots (called *potash kettles*) in which the lixivium from which it is obtained is boiled down. Some of its old names were, *vegetable alkali*, in allusion to its being derived from the incineration of vegetables; *salt of tartar*, from the fact that cream of tartar is another source of potash, and *alkali of nitre*, from its having been known to form the basis of that salt. The process employed in the arts for obtaining potash is the following: The ley of vegetable ashes is mixed with quick lime and boiled down in iron pots, and the residuum ignited; the substance remaining after ignition is common potash. The purest potash is obtained from the mutual action in a red-hot iron pot, of nitre and tartar, in the ratio of one of the former to two of the latter; the basis of each of these salts is potash, and the acids combined with them are destroyed by their action on each other. Those ashes which are derived from plants growing remote from salt water yield this alkali in greatest purity. Herbaceous vegetables yield more than trees; in trees, the branches yield more than the body, the small branches more than the large, and the leaves most of all. One thousand pounds of the following vegetables yielded saline matter in the following order:—

Wormwood,	748
Stalks of sun-flower,	349
Stalks of Turkey wheat,	198
Vine branches,	162
Fern,	116
Box,	78
Fumitory,	369
Beech,	219
Elm,	166
Fir,	132
Oak,	111
Heath,	115
Aspen,	61

The alkali arises from various salts existing in the vegetable juices, and which have been decomposed by the action of fire. To prepare the potash, in a state of perfect purity, from the impure article bearing this name in commerce, we boil the common potash with twice its weight of quick-lime for a few hours, in abundance of water,—separate the precipitate, and boil the liquid down to the consistence of a sirup; after which we add an equal bulk of strong alcohol, and let the mixture stand some time in a closed vessel. Some solid matter will collect at the bottom of the vessel, above which will appear a stratum of watery liquor containing several salts in solution; while the alcohol occupies the top, and is coloured of a dark-red colour. This last is separated from the fluid below by decantation, and is evaporated to dryness in a silver basin. The dry substance is a hydrate of potash. It is solid, white, and extremely caustic. In minute quantities, it changes the purple of violets and cabbage to a green, reddened litmus to purple, and yellow turmeric to a reddish-brown. It rapidly attracts humidity from the air, and becomes semi-fluid. It is fusible at a heat of 300°, and is volatilized at low ignition. It is used in surgery, under the name of *lapis infernalis*, or *lapis causticus*. In chemistry, it is very extensively employed, both in manufactures and as an agent in analysis. It is the basis of the common soft soaps, for which purpose, however, it is not used in its pure state.

Decomposition of potash. If a thin piece of solid hydrate of potash be placed between two discs of platina, connected with the extremities of a voltaic apparatus of 200 double plates, four inches square, it will soon undergo fusion, oxygen will separate at the positive surface, and small metallic globules will appear at the negative surface, which are the basis of potash, and are called by Sir H. Davy, who discovered the fact in 1807, *potassium*. Other and more convenient methods have been devised for obtaining this extraordinary substance. That invented by Messieurs Gay-Lussac and Thénard consisted in heating potash to whiteness in a gun-barrel, in contact with turnings of iron, the air being excluded; the potassium is liberated and collected in the cold extremity of the tube. M. Bronner, by acting on calcined tartar in a bottle of wrought iron, has succeeded in obtaining potassium at a comparatively low heat. The bottle is spheroidal, about half an inch in thickness, and capable of holding about a pint of water; a bent gun-barrel, ten or twelve inches in length, screws into the mouth of the bottle. The bottle, well luted over with fire clay, is set in a strong air-furnace, so that the tube may dip down externally, beneath the surface of the naphtha contained in a cylindric copper vessel, standing in a tub containing snow or ice and water. The top of the naphtha vessel has a cover fixed on it, pierced with a hole to receive the end of the gun-barrel; and from the side of the upper part of the vessel, a small tube goes off at right angles, to let the air and vapours escape. It is advantageous to mix a little ground charcoal with the tartar, previously calcined in a covered vessel, in the same iron bottle, for example. Nearly 300 grains of potassium have been procured by this apparatus from twenty-four ounces of crude tartar. Potassium is possessed of the following properties:—It is lighter than water, its specific gravity being only 0.86. At common temperatures, it is solid, soft, and easily moulded by the fingers. At 150° it fuses; and in a heat a little below redness, it rises in vapour. It is opaque. When freshly cut, its colour is a bright silver-white; but it suffers a tarnish on a moment's exposure to the air. To preserve it unchanged, it must be kept in small vials under naphtha, or oil of copaiba. It conducts electricity, like the common metals. When thrown upon water, it acts with great violence, and swims rapidly upon the surface, burning with a beautiful light of a red colour, mixed with violet. The water becomes a solution of potash. When moderately heated in the air, it inflames, burns with a red light, and throws off alkaline fumes. Placed in chlorine, it burns with great brilliancy. On all fluids containing much water, oxygen, or chlorine, it readily acts. It combines with oxygen in two proportions. The *protoxide* is the pure potash above described, and consists of potassium 40 and oxygen 8. When potassium burns in open air, or in oxygen gas, it is converted into an orange-coloured substance, which is the *peroxide* of potassium. It may also be formed by conducting oxygen gas over potash at a red heat. It consists of potassium 40 and oxygen 24. The attraction of chlorine for potassium is much stronger than that of oxygen for this metal. *Chloride* of potassium has a saline and bitter taste. It is composed of 36 parts of chlorine and 40 of potassium. The *iodide* of potassium is formed with the emission of light, when potassium is heated in contact with iodine. It fuses readily when heated, and is volatilized at a temperature below redness. It dissolves in strong alcohol; and the solution, when gently evaporated, yields small colourless cubic crystals of iodide of potassium. It is composed of 124 iodine and 40 potassium. *Hydrogen* and potassium unite in two proportions, forming in one case a solid, and in the other a gaseous compound. The latter is produced, when hydrate of potash is decomposed by iron at a white heat; and it appears also when potassium is burned on the surface of water. It is called *potassureted hydrogen*. It inflames spontaneously in air or oxygen gas; but on standing for some hours over mercury, the greater part, if not the whole, of the potassium is deposited. The solid compound of these bodies, called *hydroguret* of potassium, is formed by heating potassium in hydrogen gas. It is a grey, solid substance, which is readily decomposed by heat, or contact with water, but does not inflame spontaneously in oxygen gas. By the aid of a little heat, sulphur unites readily with potassium, and forms a *sulphuret* of this metal; and so much caloric is evolved at the moment of combination, that the mass becomes incandescent. It has a red colour, fuses before the temperature of ignition, and assumes a crystalline texture in cooling. It consists of sulphur 16 and potassium 40. *Phosphuret* of potassium may be formed in like manner by the action of potassium on phosphorus, with the aid of a moderate heat. Charcoal, which has been strongly heated in contact with potassium, effervesces in water, rendering it alkaline, though the charcoal may be previously exposed to a temperature at which potassium is volatilized. Hence there is probably a compound of the two formed by a feeble attraction.

We now return to the subject of *potash*, or the protoxide of potassium, whose importance in a state of purity and in the compounds it forms with the acids, is so great to mankind. Potash is acted on by phosphorus. When it is heated in a close tube with phosphorus, a compound is formed, which, when thrown into water, decomposes it, phosphoric acid remaining in solution, and phosphureted hydrogen being liberated. The nature of this compound is yet uncertain; it may either be a phosphuret of potash, or a mixture of phosphate of potash and phosphuret of potassium.

Sulphuret of potash, it used to be imagined, was formed when equal parts of sulphur and dry concrete potash are heated in a covered crucible, or when one part of sulphur and two parts of sub-carbonate of potash are heated together. But the usual product of these methods is sulphuret of potassium. It is said, however, that if the heat be kept moderate, a proper sulphuret of potash is formed. It is inodorus while dry; but when moistened or dissolved, acquires a fetid smell, from the production of sulphureted hydrogen. From suffering decomposition when in a state of solution, it is scarcely possible to discover precisely its peculiar agencies.

Hydrosulphuret of potash is formed by transmitting sulphureted hydrogen through a solution of potash. It is obtained in large prismatic crystals, white and transparent; its taste is alkaline and bitter. It attracts humidity from the air, and is soluble both in water and alcohol.

Carbonate, or *sub carbonate* of potash. This is the *pearl ashes* of commerce. It is obtained from heating the crude potash in a reverberatory furnace, and stirring it briskly for some time at a white heat. From the predominance of the alkali in it, it is deliquescent; if exposed to the air, it soon attracts its weight of water, which is the quantity necessary for its complete solution. Its taste is acrid; it changes the vegetable colours to green, and combines with oils. These characters are so distinctly alkaline, that they formerly led to the opinion, that the potash was in excess in the salt, and hence it was termed a sub-carbonate; they are, however, to be ascribed rather to the weak acidity of the carbonic acid than to deficiency in its proportion; for it is proved that the salt consists of carbonic acid 22 and potash 48; hence it is strictly a carbonate of potash. It is decomposed by the acids; its carbonate acid being disengaged with effervescence.

The *bi carbonate* of potash may be obtained by exposing the solution of the carbonate to the air for some time, carbonic acid being imbibed from the atmosphere, and crystals being deposited; or it is formed more directly by passing a current of carbonic acid gas through a solution of the carbonate of such a strength that crystals form spontaneously. They are much more soluble in hot water,—the water taking up five sixths of its weight; but, if the temperature be that of boiling water, part of the carbonic acid assumes the elastic state, and rises through the liquor. The taste of this salt is more mild than that of the pearl ashes; though still alkaline, it has no causticity, but it changes the vegetable colours to a green. It contains just double the quantity of carbonic acid in the carbonate of potash. It is much used for medicinal purposes.

Nitrate of potash, *nitre*, or *saltpetre*, is a white, translucent, or transparent salt, usually crystallized in distinct six-sided prisms, with dihedral summits. Its taste is penetrating; but the cold produced by placing the salt to dissolve in the mouth, is such as at first to predominate over the acid. Seven parts of water dissolve two of nitre, at the temperature of 60°; but boiling water dissolves its own weight. Its constituents are nearly equal weights of nitric acid and potash. On being exposed to a gentle heat, it fuses; and in this state being poured into moulds, so as to form little round cakes, or balls, it is called *sal prunella*, or *crystal mineral*. Nitre powerfully promotes the combustion of inflammable substances. Two or three parts, mixed with one of charcoal, and set on fire, burn rapidly; nitrogen and carbonic acid gas are given out; and a small portion of the latter is retained by the alkaline residuum, which was formerly called *clyssus of* *nitre.* Three parts of nitre, two of sub-carbonate of potash, and one of sulphur, mixed together, form the *pulvis fulminans*, a small quantity of which, laid on a fire-shovel, and held over the fire till it begins to melt, explodes, with a loud, sharp noise. Mixed with sulphur and charcoal, it forms *gunpowder*. (q. v.) Three parts of nitre, one of sulphur, and one of fine saw-dust, well mixed, constitute the *powder of fusion*. If a bit of base copper be folded up, and covered with this powder, in a walnut shell, and the powder be set on fire with a taper, it will detonate rapidly, and fuse the metal into a globule of sulphuret, without burning the shell. The sources of nitre are as follows:—It is found ready formed in the East Indies, in Spain, in the kingdom of Naples; and it abounds in the limestone caves of the western and south-western states of America, in which last-mentioned situations it is rarely found ready formed, but is obtained from the nitrate of lime, which is changed to nitre by being mingled with wood-ashes, and leached. Far the greater part of the nitrate made use of is produced by a combination of circumstances, which tend to compose and condense nitric acid. This acid appears to be produced in all situations where animal matters are completely decomposed with access of air, and of proper substances with which it can readily combine. Ground frequently trodden by cattle, and impregnated with their excrement, or the walls of inhabited places, where putrid animal vapours abound, such as slaughter-houses, drains, or the like, afford nitre by long exposure to the air. Artificial nitre beds are made by an attention to the circumstances in which the salt is produced by nature. Dry ditches are dug, and covered with sheds, open at the sides, to keep off the rain; these are filled with animal substances of all kinds, and occasionally watered, and turned up, from time to time, to accelerate the process by increasing the surfaces to which the air may apply. When a certain portion of nitrate is formed, the process appears to go on more quickly; but a certain quantity stops it altogether, and, after this cessation, the materials will go on to furnish more, if what is formed be extracted by lixiviation. After a succession of many months, more or less, according to the management of the operation, in which the action of a regular current of fresh air is of the greatest importance, nitre is found in the mass. If the beds contained much vegetable matter, a considerable portion of the nitrous salt will be common saltpetre; but if otherwise, the acid will, for the most part, be combined with the calcareous earth; to extract the saltpetre from which, a number of large casks are prepared, with a cock at the bottom of each, and a quantity of straw within to prevent its being stopped up: into these the matter is put, together with wood-ashes, either strewed at top or added during the filling. Boiling water is then poured on, and suffered to stand for some time, after which it is drawn off, and other water added, in the same manner, as long as any saline matter is afforded. The weak brine is heated, and passed through other tubs, until it becomes of considerable strength; it is then carried to the boiler. It contains nitre and other salts, the principal one of which is common salt. It is the property of nitre to be much more soluble in hot than in cold water, as has been seen above; but common salt is very nearly as soluble in cold as in hot water. Whenever, therefore, the evaporation is carried by boiling to a certain point, much of the common salt will fall to the bottom, for want of water to hold it in solution, though the nitre will remain suspended by virtue of the heat. The common salt thus separated is taken out with a perforated ladle; and a small quantity of the fluid is cooled, from time to time, that its concentration may be known by the nitre which crystalizes in it. When the fluid is sufficiently evaporated, it is taken out and cooled, and a great part of the nitre separates in crystals, while the remaining common salt continues dissolved, because equally soluble in cold as in hot water. Subsequent evaporation of the residue will separate more nitre in the same manner. By the suggestion of Lavoisier, a much simpler plan was adopted; reducing the crude nitre to powder, and washing it twice with water. This nitre, which is called *nitre of the first boiling*, contains some common salt, from which it may be purified by solution in a small quantity of water, and subsequent evaporation; for the crystals thus obtained are much less contaminated with common salt than before, because the proportion of water is so much larger, with respect to the small quantity contained by the nitre, that very little of it will crystalize. The *uses of nitre* are various. Besides being employed in the composition of fluxes, and for the purposes of metallurgy, it serves to promote the combustion of sulphur in fabricating sulphuric acid. It is used in the art of dying; it is added to common salt for preserving meat, to which it gives a red hue; it is prescribed in medicine as a cooling febrifuge and diuretic; and some have recommended it, mixed with vinegar, as a very powerful remedy for the sea-scurvy.

Sulphate of potash is formed by adding diluted sulphuric acid to a solution of carbonate of potash, until the acid and alkaline properties are neutralized. It crystalizes in six-sided prisms, with pyramidal terminations, and requires for its solution seventeen parts of water at 60°, and five parts at 212°. Its taste is bitter.

Bi-Sulphate of potash is the salt remaining after the decomposition of nitre by sulphuric acid. It contains twice the quantity of acid in the sulphate, has a very sour taste, and reddens vegetable colours, and is more soluble than the sulphate.

Phosphate of potash forms a gelatinous mass, which attracts humidity from the atmosphere; its taste is saline, with a degree of sweetishness.

Sub-orate of potash is soluble in water, and by evaporation affords prismatic crystals, which are not changed by exposure to the air.

Muriate of potash has a saline taste, which is slightly bitter. Its crystals are cubic, and decrepitate when heated.

Chlorate of potash, or *hyperoxymuriate*, may be formed by receiving chlorine as it is formed into a solution of potash. When the solution is saturated, it may be evaporated gently, and the first crystals produced will be the salt in question. They are shining, hexahedral laminæ, or rhomboidal plates. Its taste is cooling and disagreeable. Specific gravity, 2. Sixteen parts of water at 60°, and two and a half of boiling water, dissolve one of it. The purest oxygen is obtained from this salt, by exposing it to a gentle heat. Its effects upon inflammable substances are very powerful. Two grains, rubbed into a powder in a mortar, and mingled with one grain of sulphur, give a loud detonation when struck upon an anvil with a hammer. Five grains of the salt, mixed, in the same manner, with two and a half of charcoal, will be inflamed by strong trituration. If a little sugar be mixed with half its weight of the powdered chlorate, and a little strong sulphuric acid poured on it, a sudden inflammation will ensue. If to one grain of the salt in a mortar we add half a grain of phosphorus, and communicate to it a slight trituration, it will detonate with great violence, and attended with some hazard to the operator from the jets of burning phosphorus. Chlorate of potash is decomposed by the acids, accompanied with the evolution of a dense yellowish-green vapour, which acts with great energy on inflammable substances. In this way a light may be easily obtained, at any time, by placing a few grains of the salt on a piece of paper, dropping a little oil of turpentine on them, and then adding a drop of strong sulphuric acid; the oil will be immediately inflamed, and will kindle the paper. In the common match-bottles for procuring light, a mixture, consisting of sugar, like that above described, except the presence of a little mucilage to form the compound into a paste, is spread over sulphur matches, which are dipped into a bottle containing a portion of strong sulphuric acid, retained by fibres of amianthus, or spun glass. Chlorate of potash consists of 9.5 chloric acid and 6 potash.

Fluate of potash has a sharp taste, is deliquescent, very soluble in water, and not easily crystallizable.

Hydriodate of potash is very soluble in water. When dried, it is decomposed, like the other hydriodates, and is converted into iodide of potassium. We have alluded to the most important uses of potash in the arts and medicine. It may be added that, besides being produced in the vegetable, it is found in the mineral kingdom, either as a saline combination, or as an ingredient in earthy fossils; and it is likewise found in several of the animal fluids and solids.

POTATO (*solanum tuberosum*). Mankind owe this invaluable root to the continent of South America, where it grows wild, and where it was cultivated long previous to its introduction into Europe. Clusius is the first European writer who mentions it, about the year 1588, and from this period it spread into the different parts of the old continent with greater or less rapidity. The potato has been cultivated in Suabia and Alsace only since 1720, and did not reach Switzerland till 1730. Almost every where its introduction met with great opposition. The French, especially, were excessively prejudiced on the subject; and it was not till a time of scarcity, during the revolution, had fastened it upon them, that its culture became general. Now, however, it is almost universally cultivated within the tropics, and to latitude 64° north, in Sweden; and it seems to be adapted to all exposures, and almost every soil. The potato has added millions to the population of Europe, and has there rendered unknown those famines which formerly were so frequent and so distressing. The roots are large tubercles, rounded or oblong, almost always white internally, but differing, in different varieties, in the colour of the skin, which is of various mixtures, of brown, purple, red, yellow, and white. The stems are angular, herbaceous, and from one and a half to two feet high. The leaves are pinnate, composed of five or seven lanceolate oval leaflets, having lesser ones between them. The flowers are pretty large numerous, and disposed in corymbs upon long peduncles, which are inserted opposite to the superior leaves; their colour is violet, bluish, reddish, or whitish. The fruit is of moderate size, and reddish-brown when ripe. The potato succeeds best in a light sandy loam, containing a certain proportion of vegetable matter. The usual mode of planting is by cutting the roots in pieces, reserving one eye, or bud, to each piece, and covering these with earth. It is a much more certain crop than any other, having little to fear from storms, or hail, or even from long droughts, or continued rains. It is besides, planted the latest of all, and gathered in when all others have been disposed of. The varieties of the potato are very numerous, differing in the time of ripening, in their form, size, colour, and quality; and, in general, every district has its peculiar or favourite ones; and their names are quite arbitrary, or local. Some degenerate, and others improve, by removal to another district. New ones are readily procured by sowing the seeds, which, with care, will produce tubers the third year, and a full crop the fourth. In addition to the usual culinary uses of potatoes, bread may be made by mixing with them a nearly equal portion of wheat flour; and also a kind of cheese, by reducing them to the consistence of paste, adding an equal quantity of curd, and, with a little salt, and some other ingredients, mixing the whole together, and forming it in moulds. Alcohol is very extensively distilled from them in Europe. Starch may be made by the simple process of scraping them in water, and well washing the pulp, when the starch settles to the bottom in a heavy and dense sediment. This starch is not only used for the same purposes as that prepared from wheat, but also as a size, which does not putrefy, like that produced from animal substances, and has no disagreeable smell. Yeast may also be prepared from the potato, and even the seed-vessels may be employed as a pickle; and, when properly prepared, are said to be superior to the cucumber.

POTEMKIN, GREGORY ALEXANDROWITSCH, prince, and Russian field-marshal, was born in 1736, at Smolensk, of a family of Polish extraction. Of all the favourites of the empress Catharine II., Potemkin was for thirty-two years the only one who gained the complete control of public affairs. According to the description which Dohm gives of him, in his memoirs, he was only a bold and artful courtier, without solid political knowledge. His rapid success, his great influence, the power which he exercised over the empress, and even his Oriental and affected manner of life, have frequently caused him to be viewed as an extraordinary man, whose faults were merely the results of his great qualities. His rudeness and caprice have been construed into originality, and the free scope which he gave his passions has been taken for greatness. Potemkin was without moral worth; nay, more—he was a a very ordinary man, who, favoured by extraordinary circumstances, became engaged in important relations. After the early death of his father, he entered the military service, and, two years later (1762), became an ensign in the horse-guards. As Catharine was riding through the ranks in uniform, for the purpose of gaining the troops to favour her advancement to the throne, Potemkin perceived that she had no tassel on her sword. He immediately untied his own, and presented it to the empress. His form and his attention made an impression upon her. He soon confirmed himself in her favour, after he was admitted to her society. He supplanted his rivals, especially the brothers Orloff, and, in 1776, was the declared favourite. The hatred of his rivals was increased by his arrogance, and in a duel with Alexis Orloff, he lost an eye. This circumstance made him more dear to the empress, and as he retired occasionally, from prudence, he escaped becoming tiresome. Catharine appointed him minister of war. He succeeded in persuading the empress that he was indispensable for her security. She was sensible that she was hated by many powerful men; she also feared her son, to whom she had engaged to transfer the throne on his majority, and regarded Potemkin as a daring, resolute man, capable of putting down opposition. She committed to him, therefore, unlimited power, before which she herself, at last, trembled. Nevertheless he maintained, from 1776 until his death, a space of sixteen years, a boundless sway over the empress, in spite of his enemies. From 1778 till his death, he exercised almost the whole direction of foreign affairs, which he conducted in a daring and reckless spirit. He caused a proposal to be made to Frederic II., in 1782, through count Gorz, for a new division of what remained of Poland. "The first division," he said, "was only child's play; had the whole been divided at that time, the cry would have been no louder." When the king rejected this proposal on grounds of right, prince Potemkin was so astonished that, after a third perusal of the answer, he returned it to the minister with the words, "I should never have imagined that king Frederic was capable of romantic notions." In 1783, when the Tartars of the Crimea refused to acknowledge the authority of the empress, the generals had orders to cut down the refractory. One general refused to comply, saying that he was no executioneer; but Paul Potemkin, a relation of the prince, executed the commission, and caused 30,000 men, women, and children, to be seized and put to death. While governor-general of Taurida, Potemkin treated the Tartars with the greatest cruelty, and thus depopulated the province. He was jealous of all which interfered with his vanity or ambition. Every man distinguished by merit, birth, or riches, was treated with indignity. The representatives of foreign powers were treated as his subjects. His arrogance towards the empress was such that he was even said to have struck her. Certain it is, that he often opposed her wishes, and purposely acted contrary to them. On the other hand, he deluded her by the boldest flattery, accommodated to her character, as, for example, in 1787, on her journey to Taurida. (See *Catharine II.*) Another time, he reviewed, before the empress, the same regiments on different days, in different uniforms, in order to convince her that the numbers of the army were complete. The Prussian ambassador, count Gorz, says of him, "He is a man who has genius and talents, but his character does not attract love or esteem." Potemkin, however, directed his attention to some useful objects. He proposed to the empress to take possession of the Crimea, and to lay the foundation of the city of Cherson, on the Dnieper, about seven leagues from Oczakow, in 1778. He introduced fruit-trees into Taurida. Petersburg is also indebted to him for a manufactory of glass and looking-glasses, which equals, in the size and beauty of its productions, those of Venice and Paris. Potemkin paid particular attention to the arts, was passionately fond of music, and had eighty musicians in his train. In 1776, he was made a prince of the German empire. Afterwards he wished to become duke of Courland. In 1787, Catharine gave him the name of the *Taurian* (Tawritscheskoi). The riband of the order of St George, which could be bestowed only on a commander-in-chief after a victory, was wanting to complete his honours. Hence, in 1787, he enticed the Porte to a declaration of war. The (so called) Greek system, and the expulsion of the Turks from Europe, was his favourite plan, the execution of which seemed to him at hand after Catharine's above-mentioned journey to Taurida, and her connexion with Joseph II. In case of its success he expected to hold Moldavia and Walachia, as an independent principality, under the protection of Russia. At the commencement of the war, Potemkin was placed, with unlimited power, at the head of an army of 150,000 men, and distinguished generals served under him. The war was carried on with fury on the plains of Oczakow, Cuban and Little Tartary. Hunger and pestilence increased the universal distress. Nevertheless, Potemkin undertook the siege of Oczakow, which lasted from July to the 17th of December, 1788. Potemkin, at last, ventured a decisive blow, in order that he might not be compelled to raise the siege. In the night of December 17th, he took the works by storm, though they had received hardly any injury, but a small breach. The attempt, however, would have failed but for the blowing up of a powder magazine. The slaughter was terrible; the city was plundered for three days; more than 30,000 men perished on both sides; but Potemkin received the great riband of St George, a present of 100,000 roubles, the title of hetman of the Cossacks, and a baton set with diamonds and encircled with branches of laurel. When he returned to Petersburg, in March, 1791, the empress caused splendid festivals to be prepared in honour of him, gave him the Taurian palace and a dress set with diamonds. The author of the war, however, was seized with the sickness which raged in the camp. Without regarding the advice of the most celebrated physicians of Petersburg, who attended him, he continued his excesses. As the air of Jassy was prejudicial to him, he set out for Nicolajeff; but, on the second day of his journey, he became so unwell that he descended from the carriage and expired in the arms of his niece, the countess Branicka, under a tree, on the 16th of October, 1791. His body was carried to Cherson, where the empress appropriated 100,000 roubles for the erection of a monument to him, which was never completed. Afterwards, the emperor Paul caused the corpse of his mother's favourite to be taken from its coffin, and thrown into the ditch of the fortification, and neither the coffin nor body is now to be found. Satiated even to disgust with sensual pleasure, Potemkin denied himself nothing, and satisfied every passing whim by a prodigal waste of the money of the state, and a wanton sacrifice of the lives of others. Though the empress denied him nothing, and the sums of money which she expended on him exceeded all belief, still he was mean enough to appropriate to himself the money intrusted to him for other purposes, and even to forge orders on the treasury, in the name of the empress, in order to obtain for himself the money which was necessary for supplying the wants of the state. Potemkin also suffered himself to be purchased by foreign powers. While possessed of incredible wealth, and throwing away the largest sums at the gaming table, or in the gratification of his whims, he did not pay the bills of those who furnished his ordinary supplies. Those tradesmen considered themselves ruined who received orders to furnish goods to Potemkin.

POTHIER, Robert Joseph, a celebrated French jurist, born 1699, died 1772. His digest of the maxims and principles of the Roman law, contained in Justinian's pandects, under the title of *Pandectæ Justinianeæ in novum Ordinem digestæ*, was more highly esteemed in foreign countries than at home. Of his profound knowledge of the *droit coutumier*, we have a proof in his *Introduction à la Coutume d'Orleans*, and the commentary which accompanies it. His different treatises on various points of legal science are in the highest esteem. The first, which is a sort of foundation for the others, is his *Traité des Obligations*, which, as is also the case with the rest, displays a methodical mind, and is distinguished for clearness, profundity and precision, and for its high tone of morality, which was in accordance with the character of his life. Pothier was appointed professor of French law at the university of Orleans, and appropriated the salary attached to his office for premiums to his most industrious pupils. All his works, except the Pandects, are contained in the edition of Siffrein (Paris, 1821—23, 17 vols., 8vo.)

POTOCKI; the name of an ancient Polish family, of which we shall here mention several of the most distinguished members.

1. Count *Paul* was an illustrious statesman and scholar of the seventeenth century, whose works were published by Zaluski, with the addition of a *Genealogia Potochiana*.

2. Count *Anthony*, grandson of the preceding, was ambassador of Augustus II. to Russia, and, in the reign of Augustus III., marshal of the nobility. His masterly speeches are, in part, given in Daneykowicz's *Suada Polona*.

3. Count *Stanislaus Felix*, the commander of the Polish artillery, acted an important part in the troubles of 1788. He adhered pertinaciously to the old constitution of the republic, and exerted his influence against the constitution of May 3, 1791. (See *Poland*.) Potocki so far forgot his duty to his country as to form connexions with Russia, and, in May, 1792, joined with Rzewuski and Branicki in the declaration at Targowicz against the constitution. He then united himself with the Russian army, and was one of the leaders of the diet of Grodno, which abolished the constitution, and subscribed the act for the partition of the country. (See *Poniatowski*.) He was thought to aspire to the crown, and received several important appointments from Catharine II. When the Cracow confederation, under Kosciusko, Kolontay, Ignatius Potocki, &c., had occasioned the expulsion of the Russians from Warsaw and Wilna, he fled to Russia, and was condemned by the supreme tribunal of the republic as a traitor to his country, and his estates were confiscated. Catharine, however, restored his estates, and made him commander-in-chief. He died in 1803.

4. Count *Ignatius*, his cousin, born 1751, grand marshal of Lithuania, united with Malachowski, Kolontay, and other patriots in support of the constitution of May 3, 1791. He also procured the declaration of the king in favour of it, and, in 1792, went to Berlin for the purpose of inducing the Prussian court to protect the Poles from Russia. When the Russian troops took possession of the country, Potocki fled to Dresden, and was deprived of his estates. In 1794, he returned to Warsaw to engage in the attempt of Kosciusko, was appointed general and member of the supreme national council. After the capture of Warsaw, he remained in the city, trusting to the capitulation concluded with Suwarroff, but he was arrested in December, and confined as a state prisoner in Russia, until he was released by Paul in 1796. In 1806, he again engaged in public affairs, and exerted himself to effect the abolition of slavery, and to promote the progress of education among the people. He died in 1809.

5. Count *Stanislaus Kostka*, his brother, was always faithful to the cause of his unfortunate country. He distinguished himself greatly by his information and his eloquence, in the various diets which were held between 1788 and 1792. In the latter year he became general of artillery. When the king acceded to the confederation of Targowicz, and by that false step consummated the ruin of Poland, count Potocki retired into Austria; but he was arrested there, and imprisoned in a fortress. On being restored to liberty, there being no hope of breaking the chains of his countrymen, he retired to his estate, and devoted himself to the sciences and arts. When, however, the French penetrated, in 1807, into Poland, he rallied around him the friends of independence; and, on the grand-duchy of Warsaw being established, he was chosen one of the plenipotentiaries to Napoleon. While the grand-duchy existed, he held various high offices. When Napoleon meditated the restoration of the ancient kingdom of Poland, Potocki's talent and influence were called into action by him; and the abbé de Pradt pays to the count a warm tribute of praise on this occasion. In 1815, count Potocki was appointed minister for ecclesiastical affairs and public instruction, and was afterwards chosen president of the senate. He died in 1822. He was the author of a work on eloquence, and of a Polish translation of Winckelmann's work on art.

POTOMAC; a river which rises in the Alleghany mountains, and forms, through its whole course, the boundary between Maryland and Virginia. It passes by Shepherdstown, Georgetown, Washington city, Alexandria, and other places, and flows into Chesapeake bay, between point Look-out and Smith's point. It is seven and a half miles wide at its mouth, and one and a quarter at Alexandria, 290 miles from the ocean. The termination of the tide water is above 300 miles from the sea, and the river is navigable for the largest ships through nearly that distance. Its junction with the Shenandoah, at Harper's ferry, is regarded as a great curiosity. (See *Harper's Ferry*.) The river is seven fathoms deep at its mouth, five at St George's island, three at Swan's point, and thence to Alexandria. Above Washington city, there are many obstructions to the navigation.

POTOSI; a city of Bolivia (q. v.), in the province of the same name; lat. 19° 34′ S.; lon. 67° 22′ W. It was founded in 1547; the royal mint was established in 1562, and the population increased so rapidly, that in 1611 it amounted to 160,000, but in 1826 had sunk to 11,200. The mountain of Potosi is 16,250 feet high; and the city stands on a plain 11,000 feet above the sea. The streets are narrow and irregular; the houses are built of stone or brick, of only one story, with balconies of wood, but without chimneys. The city contains three monasteries, five convents, an hospital, a college, nineteen parish churches, and a mint. The mines were discovered by Diego Hualca, an Indian peasant, when pursuing wild goats. Arriving at a steep place he laid hold of a small shrub to prevent himself from falling; but the shrub, being unable to support his weight, was torn up by the roots, and disclosed to the hunter a rich mass of silver, lumps of which adhered to the earth that came away with the plant. Not long afterwards the discovery was made known, and the mine was opened in 1545. From the time of the first discovery to 1803, these mines supplied 1,095,500,000 piastres, or £237,358,334 sterling, which paid the royal duties; and this only includes silver. If the gold and smuggled metals were included, the amount would be much greater. According to the official statement, the amount coined from 1790 to 1794, inclusive, was 27,967,566 dollars, i. e. on an average, 5,593,513 dollars yearly. The present diminution of the quantity of silver from what it was formerly, is stated by Pazos as four to one; by Humboldt the diminution is stated to be greater; but they are still the richest mines in South America. The number of mines worked was formerly 300; in 1803, only ninety-seven. According to Helms, nothing can equal the ignorance with which the mining operations are conducted; if judiciously managed, the quantity of silver might be doubled.

POT-POURRI (*French*) signifies the same as *olla podrida*, (q. v.) It also signifies a vessel containing flowers or plants, and more generally any sort of medley. See *Quodlibet.*

POTSDAM; a residence of the king of Prussia, seventeen miles west from Berlin, on the river Havel, with 25,000 inhabitants, of whom 5,700 are soldiers. Several troops of the guards are always stationed here. It has five churches, one synagogue, and 1600 houses. It contains palaces and gardens, chiefly built and laid out by Frederic the Great (whose favourite residence was Potsdam), at an immense expense, a military orphan house for 600 children, in exemplary order (besides 2000 other children of military persons who are provided for by this establishment), with various other public buildings; but the general appearance of the place is cheerless, because it has no manufacturing industry, nor commerce. A very fine road leads from Berlin to Potsdam, through a most uninteresting plain. Potsdam itself, however, is rather pleasantly situated; lon. E. 13° 5′; lat. N. 52° 24′ 19″.

POTTER, John, primate of all England, born in 1674, was the son of a linen draper of Wakefield, in Yorkshire, in the grammar school of which town he received the rudiments of a classical education. He then became a member of University college, Oxford, where, in his twentieth year, he published *Variantes Lectiones et Notæ ad Plutarchi Librum de audiendis Poetis; et ad Basilii magni Orationem ad Juvenes quomodo cum Fructu legere possint Græcorum Libros.* The next year he became fellow of Lincoln college, and, in 1697, printed an edition of Lycophron. Soon after appeared his *Archæologia Græca*, or the Antiquities of Greece, in 2 vols., 8vo, which has gone through many editions, and is almost indispensable to the classical student. In 1706, he became chaplain to queen Anne, on which occasion he graduated as doctor in divinity. In 1715, being then regius professor of divinity, he was raised to the see of Oxford, and, in 1737, was appointed archbishop of Canterbury. He died in 1747. His works, besides those enumerated, are, a Discourse on Church Government (1707); an edition of Clemens Alexandrinus (1714); and theological works, printed together, in 3 vols., 8vo. (Oxford, 1753).

POTTER, Robert, born in 1721, graduated at Cambridge, 1741, died in 1804, was an admirable classical scholar, distinguished by his excellent translations of the works of Æschylus (1777), Euripides, Sophocles (1788), equally remarkable for the spirit and fidelity with which they are rendered.

POTTER, Paul; a painter of animals, born at Enkhuisen, in 1625, was the son of Peter Potter, a painter, from whom he received his first instruction, but to whom he himself was greatly superior. As early as his fifteenth year he had executed a work which was universally admired; and, after he settled at the Hague, he was unable to satisfy the demand for his works. His department was the painting of animals and landscapes, but he was more particularly successful in the former; the latter were designed merely to afford an opportunity for exhibiting animals in different attitudes and circumstances. His colouring is uncommonly brilliant, and the separate parts are most delicately executed, yet without any appearance of stiffness or mannerism. His pieces were generally of a small size: but there is one in the Louvre, which originally belonged to the prince of Orange, representing a man and cattle as large as life. His walks were always occupied in study; whatever struck his fancy, he immediately sketched. He died in 1654, at the age of twenty-nine years, at Amsterdam, where he had been residing two years. His engravings are not less esteemed than his paintings. His cabinet pieces command a very high price. His celebrated Cow, which was taken from the Cassel gallery to Paris, was bought by Alexander, emperor of Russia, for about 4000 dollars.

POTTER'S CLAY. See *Clay.*

POTTERY. The art of forming vessels or utensils of any sort of clay, kneaded with water, and hardened in the fire, is of high antiquity; and we find mention of earthenware in the Mosaic writings. The Greeks, at an early period, had potteries at Samos, Athens, and Corinth. Demaratus, father of Tarquinius Priscus, is said to have instructed the Etruscans and Romans in this art, of which the Etruscan vases show the great perfection. In the different kinds of earthen ware, the different degrees of beauty and costliness depend upon the quality of the raw material used, and upon the labour and skill expended in the operation. (See *Clay.*) The cheapest products of the art are those made of common clay, similar to that of which bricks are formed, and which, from the iron it contains, usually turns red in burning. (See *Bricks.*) Next to this is the common crockery ware, formed of the purer and whiter clays, in which iron exists only in minute quantities. Porcelain, which is the most beautiful and expensive of all, is formed only from argillaceous minerals of extreme delicacy, united with siliceous earths, capable of communicating to them a semi-transparency, by means of its vitrification. (See *Fayence*, and *Porcelain.*)

Though the various kinds of pottery and porcelain differ from each other in the details of their manufacture, yet there are certain general principles and processes, which are common to them all. The first belongs to the preparation of the clay, and consists in dividing and washing it, till it acquires the requisite fineness. The quality of the clay requires the intermixture of a certain proportion of siliceous earth, the effect of which is to increase its firmness, and render it less liable to shrink and crack, on exposure to heat. In common clay, a sufficient quantity of sand exists in a state of natural mixture, to answer this purpose. But in the finer kinds, an artificial admixture of silica is necessary. The paste which is thus formed is thoroughly beaten and kneaded to render it ductile, and to drive out the air. It is then ready to receive its form. The form of the vessel intended to be made is given to the clay either by turning it on a wheel, or by casting it in a mould. When dry, it is transferred to the oven or furnace, and there burnt till it acquires a sufficient degree of hardness for use. Since, however, the clay is still porous, and of course penetrable to water, it is necessary to glaze it. This is done by covering the surface with some vitrifiable substance, and exposing it a second time to heat, until this substance is converted into a coating of glass. (See *Glazing.*) In the coarse earthen ware, which is made of common clay, the clay, after being mixed and kneaded, until it has acquired the proper ductility, is transferred to a revolving table, called the *wheel.* A piece of clay being placed in the centre of this table, a rotary motion is communicated to it by the feet; the potter then begins to shape it with his hands; the rotary motion gives it a circular form, and it is gradually wrought up to the intended shape, a tool being occasionally used to assist the finishing. The vessels are now set aside to dry, after which they are baked in the oven or kiln.

Stone ware may be formed of the clays which are used for other vessels, by applying to them a greater degree of heat, which increases their strength and solidity. These vessels afford the material of their own glazing by the vitrification of their surface. When the furnace in which they are burnt has arrived at its greatest heat, a quantity of muriate of soda, or common salt, is thrown into the body of the kiln. The salt arises in vapour and envelopes the hot ware, and by the combination of its alkali with the siliceous particles on the surface of the ware, a perfect vitrification is produced. This glasing, consisting of an earthly glass, is insoluble in most chemical agents, and is free from the objections to which vessels glased with lead are liable—that of communicating an unwholesome quality to liquids contained in them, by the solution of the lead in common acids which they frequently contain. *White ware* is made of white clay, or of clay containing so little oxide of iron that it does not turn red in burning, but improves its whiteness in the furnace. (See *China-ware* and *Wedgewood*.)

The manufacture of pipes is also a branch of pottery. Pano, a Spanish monk, first introduced earthen pipes from St Domingo into Spain. A manufactory was established in England by James I., in 1621, and not long after a similar one was set up at Tergow by the Dutch. The clay used for pipes must burn white, be carefully cleansed, and kneaded up to a tenacious paste. Small lumps of the paste, of a suitable size, are then formed on the wheel into cylinders, bored by the labourer with a wire, and shaped in brass moulds. The head is then hollowed by a stopper pressed into it, and the whole is again smoothed and polished, and the pipes are then baked. After baking, they are again polished with wax, gum tragacanth, or grease.

POTWALLOPERS. See *Preston*.

POUDRE DE SUCCESSION (French, *succession powder*); poisonous powder, once prepared in Italy and France to a great extent, to kill people slowly. The horrid art of poisoning never excited more attention in France than about the year 1670, when the extent of the crimes of the marchioness of Brinvilliers became known. A numerous society of young women, under the direction of an old woman, of the name of Hieronyma Spara, was discovered in Rome, in 1659, who had administered poison to many people among the highest classes, to rid wives of their husbands, and husbands of their wives, children of their parents, &c. The history of this foul blot in the records of mankind may be found, with many particulars of a painful interest, in Beckmann's History of Inventions, &c., translated by Johnston (vol. i, division *Secret Poison*). Though the times when poisoning was habitually practised have past, yet, in some cases, it has, even in our times, been carried to an inconceivable extent. In 1831, a woman of the name of Gottfried was executed in Bremen, Germany, for having successively poisoned more than thirty persons (among whom were her parents, children, husbands, friends, servants), by means of butter mixed with arsenic, used to poison mice.

POUGHKEEPSIE, in New York, is situated on the east shore of the Hudson, seventy-five miles south of Albany, and seventy-four north of New York. There are five landings with convenient storehouses, wharves, &c., and the trade is extensive. On the south line of the township is the small post village called *New Hamburgh*. *Barnegat* is the name of a place on the shore of the river, where great quantities of lime are manufactured. The trade at the landings employs many packets. The village of Poughkeepsie is situated on a plain nearly a mile from the river, on the post-road from New York to Albany. It contains the county buildings, five meeting-houses, a bank, an academy, and several factories. Many of the buildings are of stone, but the new ones are of wood or brick. Population in 1820, 5726; in 1830, 7222.

POULTICES. (See *Cataplasms*.) Mustard poultices are called *sinapisms*. (q. v.)

POUNCE; gum sandarach, pounded and sifted very fine, to rub on paper, in order to preserve it from sinking, and to make it more fit to write upon. *Pounce* is also charcoal dust, enclosed in a piece of muslin, or some other open stuff, to be passed over holes pricked in a work, in order to mark the lines or designs on paper, silk, &c., placed underneath, which are to be afterwards finished with a pen and ink, a needle, or the like.

POUND; an English weight, of different denominations, as *avoirdupois*, *troy*, *apothecaries*, &c. The pound avoirdupois is sixteen ounces of the same weight, but the other pounds are each equal to twelve ounces. The pound avoirdupois is to the pound troy as 5760 to 6999½, or nearly as 576 to 700. (See *Measures*.)—*Pound* is also the highest denomination, used by the English in money accounts, being equal to twenty shillings.

POURSUIVANT, or PURSUIVANT, in heraldry; the lowest order of officers at arms. The poursuivants are, properly, attendants on the heralds, when they marshall public ceremonies.

POUSSIN, Nicholas, historical and landscape painter, was descended from a noble but poor family, born at Andelys, in Normandy, in 1594. He first studied in his native place, and then at Paris, under masters of little merit; but he made astonishing progress. He had already acquired considerable reputation, when, in 1624, he went to Italy for the purpose of improving himself in his art. At Rome, Marini the poet became his friend, and inspired him with a taste for the Italian poets, in which Poussin found rich materials for the subjects of his paintings. After the death of Marini, he was left without patronage, and obliged to sell his productions at very low prices. He continued, nevertheless, indefatigable in the study of geometry, perspective, architecture, anatomy, and other sciences necessary for a painter, and in the practice of his art. His conversation, his walks, his readings were also almost always connected with it. In his figures, he copied antiques; he modelled statues, and reliefs with great skill; and he might have become an excellent sculptor. In his landscapes he followed nature: they usually represent plains with magnificient ruins. All his works show much study; nothing is introduced without a purpose, or merely as an afterthought. He at length found liberal patrons in cardinal Barberini and the cavaliere Cassiano del Pozzo, for whom he painted the celebrated Seven Sacraments. These works likewise gained him celebrity in France; and cardinal Richelieu, at the suggestion of Desnoyer, invited him to Paris to paint the great gallery of the Louvre. Louis XIII. appointed him his first painter, with a pension of 3000 livres. Poussin arrived in Paris in 1640, and executed numerous works, particularly historical pieces from the Old Testament, and a repetition of his Seven Sacraments, but was much harrassed by his enemies. The painter Jacques Fouquiers had been employed to decorate the gallery with views of the principal cities of France, and the architect Mencier had overloaded it with ornament. Poussin found himself under the necessity of beginning his undertaking with the removal of their labours. He also had to contend with the whole school of Simon Vouet, who was protected by the queen; and his paintings were less justly appreciated by the French, who leaned to the brilliant and showy, than by the correcter taste of the Italians.

An artist who loved quiet, and had been all his life devoted to his art, could not be contented in such a situation, and he soon determined to leave Paris. In September, 1642, while employed on cartoons of the labours of Hercules, for the gallery of the Louvre, he returned to Rome, which he never again quitted. He died there in 1665. Although Louis XIV. allowed him to retain his post and pension, yet he never became rich; his disinterestedness made him neglect the opportunity of acquiring wealth; he laboured more for fame than for money. Full of veneration for the ancients, he aspired to the lofty ideal which he observed in them. His drawing is remarkably correct; his composition judicious, dignified, and noble. His invention was rich; his style grand and heroic. His expression approaches that of Raphael, and he has been called the *Raphael of France*. His merits were due to his own efforts. His only pupil was his brother-in-law, Gaspar Dughet, who became distinguished as a landscape painter. (*See the next article.*) Poussin had studied the works of Titian, but his later productions are inferior in colouring to his earlier, since he paid less attention as he advanced in life to this branch of the art, and more to the design. Poussin has been censured for a too studied arrangement, and a too great propensity to episodes; too much uniformity in the attitudes, air, and expression of his figures; an excessive fulness in the drapery, and too small proportions in his figures—faults which may have been owing to his close imitation of the ancients. But, notwithstanding these faults, Poussin may be compared with the greatest Italian masters. Among his most celebrated works are the Seven Sacraments, the Deluge, Germanicus, the Capture of Jerusalem, the Plague of the Philistines, Rebecca, the Adulteress, the Infant Moses, and Moses bringing Water from the Rock, the Worship of the Golden Calf, John Baptizing in the Wilderness, &c., and many fine landscapes. Bellori has written his life in Italian. Chateau, Poilly, and Claudine Stella, have engraved many of his works.

POUSSIN, Gaspar, a very eminent landscape-painter, was born, according to some authors, in France, in 1600, and to others, in Rome, in 1613. His real name was Dughet. His sister was the wife of Nicholas Poussin. The disposition which he early showed for painting caused him to be placed under his brother-in-law, whose surname he assumed; and, being a lover of the country and its sports, he devoted himself to rural sketches, and became one of the greatest masters of landscape upon record. He practised his art with great distinction in various parts of Italy, but chiefly in Rome, where he lived a life of celibacy, and freely expended his gains in hospitable attentions to his friends. He worked with extreme celerity, although nothing can exceed the beauty of his scenery, and the precision of his perspective. He particularly excelled in the representation of land-storms, in which every tree seems agitated, and every leaf in motion. In his figures he was less happy, and they were frequently supplied by Nicholas. This skilful artist, whose performances are deemed very valuable, died, according to D'Argenville, in 1675, and to others in 1663; but the former date is preferred. He engraved eight of his own landscapes.

POWDER OF SUCCESSION. See *Poudre de Succession*.

POWER, in arithmetic and algebra; that which arises by the successive multiplication of any number or quantity into itself, the degree of the power being always denominated by the number of equal factors that are employed; thus,

$2 = \quad 2^1$, 1st power of 2
$2 \times 2 = \quad 2^2$, 2d power, or square.
$2 \times 2 \times 2 = 2^3$, 3d power, or cube.

Hence it appears, that the index which denotes the degree of any power, is always equal to the number of factors from which that power arises; or one more than the number of operations. See *Exponent*, and *Involution*.

POWER, in law, is an authority which one man gives to another to act for him; and it is sometimes a reservation which a person makes in a conveyance for himself to do some acts, as to make leases or the like; thus, *power of attorney*, an instrument or deed whereby a person is authorized to act for another, either generally, or in a specific transaction.

POWER, in mechanics, denotes any force, whether of a man, a horse, a spring, the wind, water, &c., which, being applied to a machine, tends to produce motion; also, any of the six simple machines, viz. the lever, the balance, the screw, the wheel and axle, the wedge, and the pulley. See *Mechanics*, and *Horse Power*.

POWER LOOMS are driven by water or steam, and are now universally introduced into cotton and woollen manufactories. See *Cotton Manufacture*.

POWER OF A GLASS, in optics, is, by some used for the distance between the convexity and the solar focus.

POWERS, Great, OF EUROPE; a term of modern diplomacy, by which are meant Britain, France, Austria, Prussia, and Russia.

POWHATAN; a famous sachem, of great authority among the Indian tribes in Virginia, at the period of its colonization. He was father of the celebrated *Pocahontas*, (q. v.)

POWNALL, Thomas, born at Lincoln in 1722, became secretary to the commissioners for trade and plantations in 1745, and had a situation in the commissariat of the army in Germany. In 1753, he went to America, and in 1757 was appointed governor of Massachusetts bay, and, subsequently, of South Carolina. He remained there till 1761, when returning to England, he was nominated director-general of the office of control, with the rank of colonel. He died at Bath, April 25, 1805. Governor Pownall was a fellow of the society of antiquaries, and a contributor to the Archæologia. He was also the author of Descriptions of Antiquities of the Provincia Romana of Gaul (1788, 4to); Descriptions of Roman Antiquities dug up at Bath (4to); Observations on the Currents in the Atlantic Ocean (1787, 4to); and Intellectual Physics (4to); besides many political tracts, as the Administration of the Colonies (London, 4th edition, 1768).

POYAIS; a fertile tract of land, on the Mosquito shore, near the bay of Honduras, with a capital of the same name, inhabited by a warlike race of Indians (the Poyais), who have hitherto maintained their independence. Sir Gregor Mac-Gregor, a British officer, who served with reputation in Spain, was afterwards (1816) active in the Venezuelan revolution, and, in 1817, took possession of Amelia island, on the coast of Florida (then belonging to Spain), calling upon the inhabitants to embrace the cause of independence. In 1819 he attacked Portobello, which he captured, but was soon after surprised in his bed, and obliged to escape out of a window. Some years after, he settled among the Poyais, and gained their confidence to such a degree as to be chosen their cacique. He encouraged commerce, founded schools, &c. In 1824, the cacique of Poyais procured a loan in London from respectable houses. The chief production of his dominions is indigo; they also yield sugar, coffee, cocoa, tobacco, mahogany wood, dye-stuffs, &c.—See the *Sketch of the Mosquito Shore, including the Territory of Poyais* (Edinburgh, 1824), by Strangeway, aid. to the cacique.

POZZOLANA, in natural history, is a kind of substance formed of volcanic ashes. When mixed with a small portion of lime, it quickly hardens; and this induration takes place even under water. This singular property of becoming petrified under water, renders it peculiarly valuable as a cement, in the erection of moles, and other buildings, in maritime situations.

POZZUOLI; the ancient Puteoli. See *Naples, City and Environs of.*

PRADO. See *Madrid.*

PRADON, JEAN NICOLAS, a poet, born at Rouen, died at Paris in 1698. His tragedies were received on their first appearance with great applause, and gained him the friendship of distinguished persons, among whom were St Evremont and Mad. de Sevigné. Pradon even ventured to appear as a rival of Racine, having attempted a tragedy on the same subject on which the latter had already written. His *Phédre et Hippolyte* was brought out in 1677, and for some time was actually preferred to that of Racine; but it has been long forgotten. His Regulus and Tamerlane are more known. Boileau made Pradon, who was, indeed, a very moderate poet, and extremely ignorant and arrogant, the subject of his satire. His dramatic pieces were published in 2 vols., 1744.

PRÆTOR, PRÆTORIANS. See *Pretor, Pretorians.*

PRAGA; a fortified town of the kingdom of Poland (waywodeship of Masovia), on the right bank of the Vistula, opposite Warsaw, of which it may be considered as a suburb. It is connected with Warsaw by a bridge of boats, and contains 3000 inhabitants. After the battle of Macziewice, in which Kosciuscko (q. v.) was made prisoner (October 10, 1794), Suwaroff advanced against Praga, the last bulwark of Poland, into which 20,000 men had thrown themselves. Zajonczek received the command of the garrison, 30,000 strong, which occupied a fortified camp before Praga. November 4, Suwaroff stormed Praga, which was taken, after a most bloody fight; 13,000 Poles covered the field of battle; more than 2000 perished in the Vistula, and 14,680 were made prisoners. Besides this loss, a great number of peasants, women, old men, children, and infants, perished in the conflict and during the pillage. The Russian loss was trifling. Suwaroff wrote to the empress from the field of battle, "Hurrah! Praga! Suwaroff;" and was answered as laconically, "Bravo! General field-marshal." He entered Warsaw on the 9th; and the last partition of Poland (1795) was the consequence of the fall of Praga. See *Warsaw.*

PRAGMATIC SANCTION. See *Sanction, Pragmatic.*

PRAGUE (in German, *Prag*); capital of Bohemia, on the Moldau; archiepiscopal see; lat. 50° 5′ N.; lon. 14° 24′ E.; fifty-four leagues north-west of Vienna; population (including the garrison, 12,354 strong) 117,059, of whom 7400 are Jews, and the remainder principally Bohemians (see *Bohemia*) and Germans. Prague contains forty-six Catholic and two Protestant churches, eleven male, and four female monasteries, nine synagogues, and six hospitals. It is surrounded by a wall and moat, and divided by the Moldau into two unequal parts, which are united by a handsome stone bridge of sixteen arches, 1900 feet in length. It consists of four divisions: the old city, comprising the Jews' quarter, and the new city, on the right bank of the river, and Hradschin and Little Prague (Kleinseite) on the left bank. To the south of Prague lies Wischerad, an old citadel, well fortified, and containing an arsenal. Although Prague is well fortified, the works are too extensive, besides being commanded by the neighbouring heights, to sustain a long defence. The streets are, in general, straight, regularly laid out, well paved, and provided with footpaths. The new city contains the handsomest streets; the houses are mostly built of stone, in a neat style, and several of them deserve the name of palaces. Among them is the palace of the famous Wallenstein (q. v.), which is one of the principal ornaments of the city. There are a number of handsome squares, and many elegant public buildings, among which are the town-house and the fine Gothic cathedral, containing the tomb of several Bohemian kings, and of St John Nepomuk. (q. v.) The university, situated in the old city, is the oldest in Germany; it was founded, in 1348, by the emperor Charles IV., and until 1409 was in a most flourishing condition; but, in that year, the interference of the government in religious matters caused the secession of several thousand foreigners, and the consequent establishment of new universities at Leipsic, Ingolstadt, Rostock, and Cracow. The number of professors in the university of Prague is forty-four; of students, 1500; the library consists of 100,000 volumes, and 4000 manuscripts in the ancient and in Sclavonic literature. There are several other literary and scientific institutions, as three gymnasia, an academy of science, &c. The manufactures of Prague are not very important; they are linen, cotton, silk, hats, &c.; and government has here a great manufactory of arms, and tobacco works. It is the centre of the Bohemian commerce, and of a considerable transit trade. Of the thirty great commercial houses, nearly half are Jewish. The general appearance of the city is poor; the lower classes are in a miserable condition. Prague is the birthplace of Jerome (q. v.), the disciple of Huss. (q. v.) In the fifteenth century, it was troubled by the persecutions of the Hussites. In 1620, the elector palatine, who had been elected king of Bohemia by the nation, was defeated by the emperor in the battle on the White mountain (*Weisser Berg*), two miles from the city (see *Bohemia*); and, in 1557, the city was bombarded by Frederic II. (the Great) of Prussia.

PRAIRIAL. See *Calendar.*

PRAIRIE (a French word, signifying a *meadow*); used in the United States to designate the remarkable natural meadows, or plains, which are found in the Mississippi Valley. Flint (Geography of the Western States) classes the prairies under three heads:—1. the *heathy*, or *bushy*, which have springs, and are covered with small shrubs, bushes, grape-vines, &c., very common in Indiana, Illinois and Missouri. 2. The *dry*, or *rolling*, generally destitute of water, and almost all vegetation but grass. These are the most common and extensive; the traveller may wander for days in these vast and nearly level plains, without wood or water, and see no object rising above the plane of the horizon. In this kind of prairies roam immense herds of bisons. 3. The *alluvial* or *wet* prairies form the third and smallest division; they are covered with a rich vegetation, and have a black, deep and friable soil, of inexhaustible fertility. They are well adapted for wheat and maize, in the proper climates. In a state of nature, they are covered with tall, rank grass, and, in the rainy season, are frequently overflowed, or contain numerous pools collected in small basins, without outlets, the waters of which therefore pass off solely by evaporation.

PRASE. See *Quartz*.

PRATER; the most famous promenade of Vienna. See *Vienna*.

PRAXITELES; one of the greatest sculptors of Greece. (See *Sculpture*.) He carried the art to such perfection that a Greek epigram on his Niobe says, "The gods changed me to stone, but Praxiteles restored me to life." Praxiteles and his contemporary Scopas united grandeur with grace; and with them (about 364 B. C.) begins the period of the beautiful style in statuary. The former also worked in bronze, but, according to Pliny, he was most successful in marble. Pliny (*Hist. Nat. lib.* 36, c. 4, 5) gives a list of his principal works, which were statues of the gods. The finest is said to have been the Cnidian Venus, whom he was the first to represent naked. According to tradition, the celebrated courtesans Cratina and Phryne (q. v.) served as models for it. This Venus is represented with a smiling countenance, and in the attitude of having left the bath, or risen from the sea. This statue was frequently copied. His Coan Venus was nude down to the hips. In Bottiger's opinion, the Venus de' Medici resembles the Cnidian Venus only in the position of the left hand; but the Capitoline Venus is considered as a copy of it. (See *Venus*.) The group of Niobe now in existence, which is also attributed to Scopas, seems to have been the production of different times. His two statues of Cupid, were also celebrated. One of them, which was placed in the temple of Cupid, at Thespia, and a statue of a satyr, which was called *periboetos* (the farfamed), were considered by Praxiteles, according to Pausanias, as his finest works. An excellent copy of the latter, discovered in a villa of the emperor Antoninus, is in the *Museo Pio-Clementino*. Among his works were also statues of Diana, Ceres, Bacchus, &c., in marble, and in bronze, which served as models to succeeding artists.

PRAYER, ATTITUDES OF. The Greeks and Romans, like all other heathen nations, extended their hands when praying, since they prayed to receive. This ancient mode of praying was at first followed by the Christians; but they afterwards changed it, extending the arms in the form of the cross, to represent the crucifixion of the Saviour. They were therefore often obliged to have their arms supported for hours, during which their prayers lasted, by their servants. They afterwards crossed their arms, and thus imitated the Oriental expression of submission and humility. It then became the practice to cross the hands, which was finally changed to the present custom of clasping them—an attitude, in ancient times, expressive of the most profound grief and submission. Among many nations (for instance, the modern Greeks), it is customary to turn, in prayer, towards the east, as the region of the holy sepulchre.

PREADAMITES (from the Latin *præ*, before); those men, or generations, who, according to some, inhabited the earth previously to the Adamitic creation. By some, therefore, it is assumed that Adam was not the first man; and Isaac Peyrer (1655) maintained that the Jews were descended from Adam and Eve, and the Gentiles from the Preadamites. The term *preadamitic* is also applied to the remains of the primitive world.

PREBEND; a yearly stipend, paid from the funds of an ecclesiastical establishment, as of a cathedral, or collegiate church. *Prebendary* is the person who has a prebend. A simple prebend has no more than the revenue which is assigned for its support; but if the prebend has a jurisdiction annexed, the prebendary is styled a *dignitary*. Prebendaries, as such, have no cure of souls; and therefore a prebend and a parochial benefice are not incompatible promotions.—The *prebendal stall* is the seat of the prebendary in the church, into which he is inducted by the dean and chapter.

PRECESSION OF THE EQUINOXES is a very slow motion of them, by which they change their place, going from east to west, or backward, *in antecedentia*, as astronomers call it, or contrary to the order of the signs. The pole, the solstices, the equinoxes, and all the other points of the ecliptic, have a retrograde motion, and are constantly moving from east to west, or from Aries towards Pisces, &c., by means of which the equinoctial points are carried farther and farther back among the preceding signs of stars, at the rate of about 50¼" each year, which retrograde motion is called the *precession*, *recession*, or *retrocession of the equinoxes*. Hence, as the stars remain immovable, and the equinoxes go backward, the stars will seem to move more and more eastward with respect to them; for which reason the longitudes of all the stars, being reckoned from the first point of Aries, or the vernal equinox, are continually increasing. From this cause it is that the constellations seem all to have changed the places assigned to them by the ancient astronomers. In the time of Hipparchus and the oldest astronomers, the equinoctial points were fixed to the first stars of Aries and Libra; but the signs do not now answer to the same points; and the stars, which were then in conjunction with the sun when he was in the equinox, are now a whole sign, or 30 degrees to the eastward of it; so the first star of Aries is now in the portion of the ecliptic called Taurus; and the stars of Taurus are now in Gemini, and those of Gemini in Cancer, and so on. Hence, likewise, the stars which rose or set at any particular season of the year in the times of Eudoxus, Hesiod, Virgil, Pliny, &c., by no means answer, at this time, their descriptions. This seeming change of place in the stars was first observed by Hipparchus of Rhodes, who, 128 years B. C., found that the longitudes of the stars in his time were greater than they had been before observed by Timochares, and than they were in the sphere of Eudoxus, who wrote 380 years B. C. Ptolemy also perceived the gradual change in the longitudes of the stars; but he stated the quantity at too little, making it but 1° in 100 years, which is at the rate of only 36" per year. Y-hang, a Chinese, in the year 721, stated the quantity of this change at 1° in 83 years, which is at the rate of 43½" per year. Other more modern astronomers have made this precession still more, but with some small differences from each other; and it is now usually taken at 50¼" per year. All these rates are deduced from a comparison of the longitude of certain stars, as observed by more ancient astronomers, with the later observations of the same stars, namely, by subtracting the former from the latter, and dividing the remainder by the number of years in the interval between the dates of the observations: thus, by a medium of a great number of comparisons, the quantity of the annual change has been fixed at 50¼", according to which rate it will require 25,791 years for the equinoxes to make their revolutions westward quite around the circle, and return to the same point again. The explanation of the physical cause of this slow change in the position of the equinoxes, or the intersections of the equinoctial with the ecliptic, is one of the most difficult problems of physical astronomy, which even Newton attempted in vain to solve in a perfectly satisfactory manner, Later mathematicians, however, as D'Alembert, Euler, Simpson, Laplace, have succeeded in it. Our limits will only allow us to say, in general, that this phenomenon is owing to the spheroidal figure of the earth, which itself arises from the earth's rotation on its axis; for, as more matter has thus been accumulated all round the equatorial parts than any where else on the earth, the sun and moon, when on either side of the equator, by attracting this redundant matter, bring the equator sooner under them, in every return towards it, than if there was no such accumulation. This subject is treated clearly and fully in the 22d book of Lalande's *Astronomy* (3d edition, Paris, 1792); see, also, D'Alembert's *Récherches sur la Précession des Equinoxes* (Paris, 1749, 4to); and Ferguson's *Astronomy* (Brewster's edition, Edinburgh, 1821.)

PRECIOUS STONES. See *Gems*.

PRECIPITATION. See *Cohesion*.

PREDESTINATION. See *Grace*, and *Calvin*.

PREFECTURES. Among the problems of the modern policy of Europe, there is, perhaps, none more important than the combination which should take place in the administration of the affairs of towns and districts, between the general government and the local authorities. In the countries of Germany, the care of certain public matters, which formerly belonged to the communities in their general assemblies, under the superintendence of their bailiffs, counts and princes, was, at an early period, transferred to the sovereign and to the stewards of the princes; and only here and there have any traces been preserved of an older constitution, which certainly once existed in all the Germanic kingdoms, but has nowhere remained to a considerable extent except in England. For all that relates to the preservation of public order and peace, the care of roads, and other public institutions, schools, poor rates, prisons, &c., the parliament is there the supreme authority, which must determine the general principles on which they are conducted, and must authorize the particular establishments that may be proposed. In the counties, the sheriff, as the king's officer, is only the guardian and administrator of the public authority, the executioner of the royal commands and judicial sentences, with power to call out the *posse comitatus* (q. v.) The administration, on the contrary, is vested chiefly in the justices of the peace, who may be considered as a deputation of the principal persons of each county and it is controlled by the grand jury, which assembles at each court of assizes. (See *Assizes*.) Connected with this independence of the counties is the right of the people to assemble in order to express their views, wishes and grievances. (See *Petition*.) This is secured and completed by the liberty of the press. In the states of the continent, the separate districts have ceased to govern themselves, and have come under the control of officers appointed by the general government; and in most of the German countries, colleges of counsellors have become common since the sixteenth century. In France, a similar course of things has taken place; in some of the provinces, indeed, the constitution of the estates was retained, and in others local officers (*élus*) were established to superintend the taxation; but the estates in the *pays d'états* were by degrees much restricted, and the *élus* reduced to mere royal officers. Most of the subjects of country police were transferred to the superior bailiwics, royal officers and parliament; but, as the *conseils du roi* were more and more developed, not only did it become the common course of things to prefer petitions to them, but *maîtres des requêtes* were annually sent through the provinces to examine the administration of them in all its branches including military, judiciary, financial and police affairs. Henry II. established them, in 1551, as perpetual overseers in all the provinces, and, under Louis XIII., in 1635, they received the name of *intendants*. Their official powers were more and more enlarged. They were bound to unconditional obedience to the ministers, and could be recalled at any time. To their functions belonged the proportional assessment of taxes, the levying of soldiers, and their removal, the procuring of supplies for the army and the royal magazines, the keeping of roads, bridges and public edifices in repair, the care of the common concerns of the districts, the regulation of the trade in corn from one province to another, &c. It was often suggested to introduce, instead of these men, invested with such arbitrary powers, a collegial administration, a part of whose members, at least, should be chosen by the provinces themselves. But this was never done; and thus the office of intendants remained till the revolution, and the abuses of their authority contributed not a little to produce this catastrophe. It was therefore one of the first doings of the national convention to abolish these offices, and, instead of them, to erect in each department a general administration, whose members were chosen by the citizens. A directory of the department was permanent: a council, on the other hand, was to meet every year, to fix the expenditures of the department, to audit accounts, and to exercise a degree of legislative power over the affairs of the department. A similar regulation was introduced in the districts and single towns. But, by this organisation, the power of the government was much weakened, and the authorities of the departments often came forward in open opposition to the ministry. It was, therefore, one of the first operations of Napoleon, who cannot be denied to have possessed an extraordinary sagacity in all that pertains to the mechanism of government, to restore the intendants, not, however, under this odious name, but under the appellation of *prefects*. This was accomplished by the law of February 17, 1800 (28 Pluv., year VIII.), by which there was established for each department a prefect (to be appointed and dismissed at pleasure by the first consul), a council of the prefecture, consisting of 3—5 members, and a general council of the department. The last, also, appointed by the first consul, was to assemble once a year to distribute the quota of the departmental taxes among the districts (*arrondissemens*, or under-prefectures), to fix the expenses of the department, to decide on remonstrances respecting excessive taxation, and to audit the accounts of the prefects respecting the departmental treasury. But it seems that these *conseils généraux de département*, as well as the *conseils d'arrondissement*, were tacitly suffered to fall into disuse. The prefects are intrusted with the whole organisation and management of the police establishments; but the punishment of offences against the police regulations belongs to particular courts not under their control. Within this sphere of action, the prefects are unchecked: the sub-prefects, who stand at the head of the districts, are entirely subject to their commands; and the authorities of the communities, as well as the justices of the peace, can set no limits to their activity. The courts have no cognizance of any matter which has already been decided by an act of prefecture (*arrêté* of the prefects, or council of the prefecture), even though the officers may have exceeded their powers until that act has been avoided by the competent authorities. By means of the prefects, the ministry can exert a great influence, not merely on public, but also on private affairs.

Under Napoleon, the prefects had to make reports of the rich heiresses of their departments, in order to afford an opportunity to the favourites of government to address them. Legraverend (*Des Lacunes de la Législation Française*) has disclosed a number of abuses, by which the prefects invaded the private property and domestic relations of the citizens. How the administration of penal justice, the elections, &c., were managed by them according to the purposes of the ministers, is notorious. The power of the prefects, however, ceases, at least by law, as soon as a legal contest arises respecting a subject of administration; for he must refer such cases to the court appointed for the purpose, the council of the prefectures, of which he is the president, but in which he has only a casting vote. Under the cognizance of this court fall all disputes respecting the taxation of particular individuals, respecting contracts for supplies, engagements with the state for building, the indemnification of those who have had to give up any thing to the public, or have been injured by the contractors for public buildings, together with injuries sustained in war, contests respecting any of the public domains, &c. The appeals against its decisions (*arretes*) lie to the council of state. Against the decision of the ministers, also, in contested matters of administration, complaints must be submitted to the council of state; but in matters not disputed, memorials alone against the prefects can be laid before the ministers, and complaints against the ministers must be addressed immediately to the king. The nature and extent of the power of the prefectures, and the destruction of freedom and independence in the administration of the townships, all parties in France agree in censuring. But how arbitrary power and partiality may be banished from the administration of the prefects, so as not to deprive the government of its requisite energy, and in what way communities may be reinvested with self-government, are questions respecting which the greatest diversity of opinion prevails.

PREGNANCY; the state of a female who is with child. Pregnancy begins at the moment of conception, and ceases with that of birth. During pregnancy, the vital activity, especially of the womb, which probably receives, a few days after conception, the fecundated vesicle, increases. The periodical discharge of blood ceases, but the vessels of the womb become enlarged, more charged with blood, longer and straighter. Its cellular substance becomes softer, and more spongy, the sides thicker, the cavity wider. It loses the pear shape, which it has when not impregnated, and becomes more globular. It sinks during the two first months of pregnancy, lower into the pelvis, but afterwards rises, and becomes larger, until, in the eighth month, the bottom of it can be felt externally in the region of the stomach. In the ninth month, it sinks again somewhat. In these changes of the womb, the embryo (q. v.) developes itself, until it has reached, in the fortieth week, a sufficient degree of maturity to be able to live separate from the mother, when the birth takes place, and pregnancy is at an end. But the vital activity is increased in the state of pregnancy not only in the womb, but in the whole body, with healthy and vigorous women. Pregnant women are bolder, more independent, more enterprising, stronger than before, and retain these qualities when they are mothers. They are more rarely affected by contagious diseases; consumption is checked during pregnancy, but makes the more rapid progress after its completion. Hysteric women feel often uncommonly well during this period; the gouty are freed from their attacks; some become uncommonly fat. On the other hand, this state is, with many, particularly with feeble, sickly, delicate, too young or too old women, often accompanied by a great many complaints, which depend upon the altered state of the systems of the vessels and nerves. The stomach particularly often suffers; hence nausea, vomiting, a morbid loathing of, or craving for, particular dishes, which were till then indifferent. Pregnant women often suffer, also, by wandering pains, particularly in the teeth, and by coughing. Much inclination exists in the body to inflammation and a heated state of the blood; the veins of the feet and the posteriors are swelled. The mechanical pressure of the womb, thus changed in situation and form, not unfrequently causes irregularities in the discharges of the urine and excrements. All these changes serve as signs of pregnancy. Other signs are the gradual and regular changes observed at the opening of the womb by internal examination; also the state of the breasts, which become larger during pregnancy, and in which a milky substance collects, but particularly the change of colour round the nipple; lastly, the motion of the child felt by the mother in the second half of the period of pregnancy, and the perception of different parts of the fœtus by external and internal examination. It is very important to determine the fact of pregnancy at an early stage; but it is very difficult in some cases, particularly in the first half of the period, because there are a number of diseases of the abdomen which are attended with similar symptoms. Pregnancy itself is subject to a number of deviations from the ordinary course. The rules laid down to prevent injury to the embryo, and to preserve the health of the mother, have reference principally to air, nourishment and exercise; to the natural desires and preternatural longings (the latter must be gratified with much caution); to the passions, which must be carefully restrained; to the imagination, because the whole nervous system may easily become over-excited, to the proper allowance of sleep, and the disposition of the dress, which must not press either the abdomen or the breast. All injuries from over-exertion or mechanical causes are to be carefully avoided, as falls, lifting, blows, &c., because they may easily occasion abortions. During pregnancy, care ought also to be taken that the breasts are fit, after the birth of the child to nourish it. It is a mistaken idea that abortions take place much more frequently among the higher classes: the poorer classes in populous cities are quite as liable to them. In the country, where a purer air keeps the body altogether in a more vigorous state, abortions occur less frequently. The advice of experienced female friends, during the whole period of pregnancy, is, of course of the greatest value; yet, in almost all countries, certain prejudices exist respecting this important state in a female's life, and the advice of a physician cannot be dispensed with. The internal examinations mentioned above are comparatively rare in Britain and the United States; but in France, Germany and Italy, if not throughout the European continent, they belong to the regular course of medical attendance in the state of pregnancy.

PREHNITE; a mineral first discovered by colonel Prehn, at the cape of Good Hope, to whom it owes its name. It sometimes occurs in oblique rhombic prisms, its primary form, but more generally in irregular eight-sided tables and low six-sided prisms. Prehnite, however, is found, for the most part, in botryoidal concretions, of the size of a pea, and larger, made up of delicate fibres; its colour is some shade of yellow or green; it is translucent, shining, and hard enough to scratch glass; specific gravity 2.8 to 3; it melts with intumescence into a pale green or yellow glass, and consists of silex 43.83, alumine 30.33, lime 18.33, oxide of iron 5.66, and water 1.83; it belongs to trap rocks and sienite, in which it is found in the form of veins and geodes. It is found in various parts of the world, and especially, in very fine pieces, in Scotland.

PRELATE; in the Roman Catholic church, those spiritual officers who exercise jurisdiction in their own name. These were, originally, only the bishops, archbishops, patriarchs, and the pope. The cardinals and legates, abbots and priors, also obtained certain privileges of jurisdiction by grant or prescription. In the German empire, previous to the secularizations of 1803, a number of high ecclesiastics, who held immediately of the emperor, had also a secular jurisdiction, and several had the princely dignity, with a seat and voice in the diets. (See *Elector*, and *German Empire*.) The term *prelates* is often used merely to signify the higher dignitaries of the church.

PREMISES. See *Syllogism.*

PREMIUM. See *Bounty.*

PREMONSTRATENSES; a religious order, founded in the French bishopric of Laon, by Norbert, a canon of Xanten in Cleves, who, by the austerity and zeal which he manifested as archbishop of Magdeburg (in 1127), acquired the honour of canonization. In the forest of Coucy, in a meadow pointed out to him, as he said, by Heaven (*pré montré, pratum monstratum;* thence the name of the order), he collected his first disciples (1120), and gave them the rule of St Augustine with some additional rigour. The Premonstratenses, therefore, consider themselves as regular canons, though, by their constitution, they are actually monks. Their order increased rapidly; several nunneries were established with the same rigid rules; at first (as was the case with that of Fontevraud) in the neighbourhood of the monasteries, from whose revenues they were supported, but subsequently at a distance from them, to avoid the dangers of intercommunication. The abbot of the original monastery Prémontré, near Coucy, was general, and, with three other abbots, formed the great council of the fathers of the order. The order was introduced into England in 1146, and its members were there regularly known as the White Canons. Before the reformation, they had 2000 monasteries, among which were 500 nunneries, mostly in Germany, the Netherlands, France, England, and the north of Europe; but the reformation diminished this number by more than one-half, in the sixteenth century. The monasteries in Spain attempted to revive their discipline in 1573, by uniting in a strict observance of their rules; but they remained in communion with those of the common observance. In 1630, this communion of all the monasteries, of both kinds, was confirmed by new statutes. In the eighteenth century, the order had no houses in Italy; in France, it had forty-two monasteries; the nunneries had all disappeared. It now consists of a few houses in Spain, Poland, and the Austrian states, especially in Bohemia, where it has at Prague one of its handsomest and richest monasteries.

PREPOSITION (from *præpositus*, placed before); a part of speech, which is used to show the relation of one object to another, and derives its name from its being usually placed before the word which expresses the object of the relation. In some languages, this relation is often expressed by changes of the termination (cases), without the use of a preposition.

PREROGATIVE COURT. See *Court*, division *Ecclesiastical Courts.*

PREROGATIVE OF THE KING OF ENGLAND. See *Britain.*

PRESBURG (*Posonium;* in Hungarian, *Posony;* in Sclavonic, *Pressburck*); a city of Hungary, capital of a palatinate of the same name, on the left bank of the Danube, which here divides into several branches, and is crossed by a flying bridge; lat. 48° 8′ N.; lon. 17° 6′ E. It is built on a hill overlooking a wide plain; the walls, which formerly separated it from the suburbs, have been demolished; the streets are narrow, steep, and only in part paved. The handsomest streets and squares are in the suburbs. The cathedral dedicated to St Martin is a large building in the Gothic style; in the chapel of St John, belonging to it, the coronation of the kings of Hungary formerly took place. The castle, which served as a barrack, was burnt down at the beginning of the present century, but its walls are standing. Presburg contains seven monasteries, fourteen churches (of which twelve are Catholic), one synagogue, several hospitals, and some literary institutions. Population 32,026, of which 25,000 are Catholics, 5000 Lutherans, and 2000 Jews. The transit trade is considerable, and there are some manufactures. Presburg was the capital of Hungary until Joseph II. made Buda the capital. The peace of Presburg (concluded Dec. 16, 1805, between Francis, emperor of Germany, and Napoleon) was the immediate consequence of the battle of Austerlitz. (See *Austria*, and *Austerlitz.*) The German emperor ceded the part of the territory of Venice acquired by the peace of Luneville to the kingdom of Italy; acknowledged the regal dignity and sovereignty of the electors of Bavaria and Wurtemberg, and the sovereignty of the elector of Baden; ceded Tyrol, Vorarlberg, and some districts, to Bavaria; the greater part of the Brisgau, with Constance, to Baden; and the towns on the Danube, and some other portions of the Suabian possessions of Austria to Wurtemberg. For these cessions, Austria received some indemnification. (See *Confederation of the Rhine;* and consult Scholl's *Histoire des Traités de Paix*, 7th vol.

PRESBYTERIANS (from the Scripture term *πρεσβυτερος*, elder); those Christians who maintain that there is no order in the church superior to that of presbyters or elders, affirming the terms *πρεσβυτερος* (elder) and *επισκοπος* (bishop) to be of precisely the same import. The Presbyterians believe that the authority of their ministers to preach the gospel, and to administer the sacraments of baptism and the Lord's supper, is derived from the Holy Ghost by the imposition of the hands of the presbytery (assembly of presbyters); and accordingly they oppose the scheme of the Independent or Congregational churches, with the same argument which the Episcopalians use, while they differ from these latter in not admitting any inequality of rank among the ministers of the church. The established church of Scotland is Presbyterian; this mode of ecclesiastical government having been introduced thither from Geneva by John Knox, the celebrated Scotch reformer. (See *Knox*, and *Scotland.*) The doctrines of the church are Calvinistic, the Westminster Confession of Faith being the standard of the national creed, which all ministers are required to subscribe. There are four ecclesiastical judicatories, viz. the kirk session, composed of the minister of the parish, and a number of the most respectable laymen; the presbytery, composed of the ministers of a certain district, with an elder from each parish; the synod, consisting of the ministers and elders of a certain number of presbyteries; and the general assembly, composed of representatives of the presbyteries (200 ministers, and 156 elders), and of the universities. This is the supreme ecclesiastical tribunal, and meets once a year. For a more detailed account of the constitution of the courts, see *Assembly, General.*

The Presbyterian church in the United States of America does not materially differ from that of Scotland. The first presbytery was organised in that country in 1704, by the association of several ministers who had received presbyterian ordination in Europe, and who agreed to govern themselves agreeably to the Westminster confession of faith (see *Creed*), form of government, book of discipline, and directory for worship. The presbyteries subsequently formed have been organized by act of this presbytery, or some superior judicatory, such as a synod or general assembly. In the middle of the last century, the Presbyterian church was divided, by a schism, into the synod of New York, or the New Lights, and the synod of Philadelphia; but, in 1758, the two bodies met, and reunited themselves into one synod, entitled the Synod of New York and Philadelphia. The first general assembly met in 1789; and, in 1831, it comprehended 2253 churches, 1801 ministers, 182,017 communicants, embracing a population of 1,800,000 souls. The number of synods, in 1830, was nineteen; that of presbyteries, ninety-eight. The theological seminaries, under the care of the general assembly, are three, at Princeton (New Jersey), Alleghanytown (Pennsylvania), and Prince Edward county (Virginia), besides several synodical seminaries.

PRESBYTERY; a Scottish ecclesiastical court. See *Assembly, General.*

PRESCRIPTION is a right or title acquired by use and time, as when a man can show no other title to what he claims, than that he, and those under whom he claims, have immemorially used to enjoy it. The object of prescription is to secure the title to property to him who has had the possession of it for the term fixed by the law, and to prevent any one from disturbing his possession after such term has expired. The law of prescription is not intended to punish the indolence of proprietors; it only interprets their silence as consent, presuming that a man who neglects to assert his right for a long series of years, gives it up. Many celebrated authors, as Grotius, Puffendorff, and Wolfius, have maintained that the law of prescription is derived from the law of nature. It forms a part of the law of nations. By the civil law, things movable become subject to prescription, after the expiration of three years, and a possession during ten years, if the parties are present (that is, in the province), and twenty years if they are absent, will also found a prescription to things immovable, if the possession was honestly obtained at first. (*Just. Inst.* lib. ii. tit. 6.) Where the possession was *malâ fide*, a prescription of thirty years is necessary to confer a title. In the code of Napoleon, the provisions in regard to prescription to things immovable are similar. In some Roman Catholic countries, prescription does not avail against the church, if short of a hundred years. In the English law, the term *prescription* is applied only to incorporeal hereditaments, as a right of way, a common, &c. A prescription is distinguished from a custom by this, that custom is properly a local usage, and not annexed to a person, such as a custom in a manor, that land shall descend to the youngest son; but prescription is merely a personal usage; as that Sempronius and his ancestors, or those whose estate he hath, have used, time out of mind, to have common of pasture in such a close; for this is a usage annexed to the person of the owner of this estate. By the law of England, a prescription must have existed from time whereof the memory of man is not to the contrary, which is to be understood, not merely of living memory, but of memory by means of records or other written memorials; and, therefore, where there is any proof of the original or commencement of any thing, it cannot be claimed by prescription; unless, indeed, the commencement were before the reign of Richard I., for then it is considered to have existed immemorially, on an equitable construction of the statute of Westminster, 1, which limited that time for a writ of right. (*Starkie on Evid.*, 1204.) In the United States, it has been made a question, whether there can be a prescription, as the settlement of the country was within the time of memory by the English law; and it has been held that there could be no prescription in that country, in some of the states. In Massachusetts, it has been held, that the time of prescription does not extend further back than sixty years, and that it is questionable whether it extended back further than forty years. (8 *Pick.* 504)

PRESIDENT; the supreme executive officer of the United States of America. The qualifications, powers, and mode of election, of this officer are settled by article II of the Constitution, the first section of which was amended in 1804. (For qualifications and mode of election, see *Election;* see also article *Constitutions.*) By section 1st of that article, it is provided, "that in case of the removal of the president from office, or of his death, resignation, or disability to discharge the powers and duties of his office, the same shall devolve on the vice-president; and the congress may by law provide for the case of removal, death, resignation, or inability both of the president and vice-president, by declaring what officer shall then act as president, and such officer shall act, until the disability be removed or a president be elected." In pursuance of this provision, the act of congress of March 1, 1792, sec. 9, declares, that in such case of vacancy, the president of the senate *pro tem.*, and if there be none, the speaker of the house of representatives, shall act until the vacancy is supplied. The president holds his office for four years, and it is provided by law (act of congress, March 1, 1792), that the term for which the president and vice-president shall be elected, shall begin on the fourth day of March next succeeding the day of election. The first section of Article II. of the constitution also provides, that "the president shall, at stated times, receive for his services a compensation which shall neither be increased nor diminished during the period for which he shall have been elected, and he shall not receive within that period any other emolument from the United States, or any of them." Before entering on the execution of his office, he is required to take the following oath or affirmation: "I do solemnly swear (or affirm) that I will faithfully execute the office of president of the United States, and will, to the best of my ability, preserve, protect, and defend the constitution of the United States." The powers of the president are fixed by section 2 of Article III, in the following terms: "The president shall be commander-in-chief of the army and navy of the United States, and of the militia of the several states when called into the actual service of the United States; he may require the opinion, in writing, of the principal officer in each of the executive departments, upon any subject relating to the duties of their respective offices, and he shall have power to grant reprieves and pardons for offences against the United States, except in cases of impeachment. He shall have power, by and with the consent of the senate, to make treaties, provided two thirds of the senators present concur; and he shall nominate, and, by and with the advice and consent of the senate, shall appoint ambassadors, other public ministers and consuls, judges of the supreme court, and all other officers of the United States, whose appointments are not herein otherwise provided for, and which shall be established by law) but the congress may by law vest the appointment of such inferior officers, as they think proper, in the president alone, in the courts of law, or in the heads of departments. The president shall have power to fill up all vacancies that may happen during the recess of the senate, by granting commissions, which shall expire at the end of their next session." Section 7 of Article I. requires that "every bill, which shall have passed the house of representatives and the senate, shall, before it become a law, be presented to the president of the United States; if he approve, he shall sign it; but if not, he shall return it, with his objections, to that house in which it shall have originated, who shall enter the objections at large on the journal, and proceed to reconsider it. If, after such reconsideration, two thirds of that house shall agree to pass the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be reconsidered, and, if approved by two thirds of that house, it shall become a law. If any bill shall not be returned by the president within ten days (Sundays excepted) after it shall have been presented to him, the same shall be a law, in like manner as if he had signed it, unless the congress by their adjournment prevent its return, in which case it shall not be a law." The same provision is extended to every order, resolution, or vote, to which the concurrence of the senate and house of representatives may be necessary (except on question of adjournment). The duties of the president are determined by Article II., section 3. "He shall, from time to time, give to the congress, information of the state of the Union, and recommend to their consideration such measures as he shall judge necessary and expedient; he may, on extraordinary occasions, convene both houses, or either of them, and in case of disagreement between them, with respect to the time of adjournment, he may adjourn them to such time as he shall think proper; he shall receive ambassadors and other public ministers; he shall take care that the laws be faithfully executed, and shall commission all the officers of the United States." Art. II., section 4, provides that "the president, vice-president, and all civil officers of the United States, shall be removed from office on impeachment for, and conviction of, treason, bribery, or other high crimes and misdemeanours." The senate has the sole power to try impeachments; but it is required by section 3 of Article I., that when the president of the United States is tried, the chief justice shall preside. (See *United States*, and *Congress of the United States*.) By the apportionment of representatives under the census of 1820, the number of presidential electors was 261 in twenty-four electoral colleges.

PRESS, Correction of the. See *Correction of the Press*.

PRESS, Laws of. See next article.

PRESS, Liberty of the; the liberty of every citizen to print whatever he chooses, which at the same time does not prevent his being amenable to justice for the abuse of this liberty. To make the liberty of the press real, two things are essential; 1. that the laws against its licentiousness should be precise and clear; 2. that they should only punish what is really injurious to the public welfare. The laws against treason under Tiberius, against heresy under the inquisition, against irreverence under Catharine II., against conspiracy under the convention, against infringements of the royal dignity, and contempt of government in various states, are very indefinite, and allow the greatest tyranny. The laws for punishing abuses of the press are generally directed against attacks upon the government or its officers, upon the reputation of individuals, and upon good morals and religion. The latitude allowed to the press of course will vary with circumstances. A discussion will be permitted in Prussia which would be punished in Austria. Discussions of certain religious topics are considered in one age blasphemous, while another age esteems them innocent. As to charges affecting the character of governments and individuals, we may observe that the freer a government is, the less sensitive it is, and the less sensitive are the people who live under it. No people are so indifferent to being publicly spoken of as the British, whilst the Prussian code contains many laws against verbal offences. (See *Injuria*.) As the liberty of speech is unquestioned, and printing only gives permanence and circulation to what might be freely spoken (newspapers, for instance, take the place of speeches and conversations in the forums of the petty states of antiquity), the right of printing rests on the same abstract grounds as the right of speech; and it might seem strange to a man unacquainted with history, that printing should be subjected to a previous censorship, as it is in most states, any more than speaking, and that the liberty of the press should be expressly provided for in the constitutions of most free states. But when we look to history, we find the origin of this, as of many other legislative anomalies, in periods when politics, religion, and individual rights were confusedly intermingled. It is only since men's views of the just limits of government have become clearer, that the liberty of the press has been recognised as a right; and to England we are particularly indebted for the establishment of this principle, as of so many other bulwarks of freedom, though the Netherlands preceded her in the actual enjoyment of the liberty of the press. When we consider the practical effect of the censorship, it is no more defensible on that ground than on the ground of abstract right. In what times and countries have morals and religion, and the reputation of individuals, been more outrageously attacked through the press, than in those in which the censorship was established? We are far from considering the liberty of the press as without evil consequences; but the censorship does not prevent these consequences, while it destroys the numberless benefits of an unshackled press. But the liberty of the press, properly considered, is not to be treated as a mere question of political expediency. Liberty of conscience and liberty of thought are rights superior in importance to any objects which fall under the head of expediency. Representative governments are empty forms without the liberty of the press. The free discussion of all political measures, and of the character of public officers, is of much more consequence than the freedom of debate in legislative assemblies. A parliament would be a comparatively small check upon a government were it not for the liberty of the press. In fact, it might easily be made an instrument for enforcing oppressive measures; since a government would find little difficulty in gaining over a majority of such a body by the motives of ambition and avarice, were it not for the control exercised over legislative bodies, by a free press. Without this, publicity of discussion in legislative assemblies would be of little avail. In fact, representative governments, without the liberty of the press, are a mockery. This liberty is, indeed, the great safeguard of all others; and a whole dynasty was lately prostrated in a struggle with this formidable power. Polignac's *Report*, which caused the revolution of 1830, will ever be memorable in the history of the liberty of the press, as proving the difficulty or impossibility of a minister's ruling in opposition to public opinion in a country where the press is free. (For the history of the press, see *Censorship*.)

In England, the liberty of the press, soon after printing was introduced, was regulated by the king's proclamations, prohibitions, charters of license, &c., and, finally, by the court of star-chamber. The long parliament, after their rupture with Charles I., assumed the same power. The government of Charles II. imitated their ordinances, and the press did not really become free till the expiration of the statutes restricting it in 1694, after which it was found impossible to pass new laws in restraint of it, and it has remained free ever since. In the article *Books, Censorship of*, an account is given of the regulations of various countries for restricting printing, and the sale of printed matter. Where the government has the complete control of either, no liberty of the press exists. In other countries, the principal rules for the regulation of the press are, 1. that all presses must have a license; the printers must often give high security for their loyal behaviour, and sometimes even take an oath. A license is required both in France and Great Britain (in the latter country it is easily obtained; but a late law in France, since the revolution of July, 1830, has required very high security). 2. the name and place of residence of the printer must be mentioned on the title-page. This is the case in Great Britain, and on the continent of Europe. The printer must keep a list of all that he prints, and some copies must be sent to the government before publication. In France, if a work is found illegal, a criminal process is instituted, and the books are not allowed to be sold until the decision is given. Government need not prosecute immediately, but can at any time. In 1817, there was much debate, whether offences of the press should be judged by the assizes (with a jury), or by the *tribunaux de police correctionnelle* (without a jury). The latter opinion prevailed, but the "special provisions," added in 1830 to the charter, provide for a trial by jury for offences of the press, and political offences. The work *Code des Imprimeurs, Libraires, Ecrivains et Artistes, par F. A. Pié* (Paris, 1816, 2 vols.), contains all the French laws of the press, to the date of its publication. In the United States, there is no restraint upon the liberty of printing. Any man can print and circulate whatever he chooses, and is only answerable if the matter itself is illegal. What publications are punishable in the United States will depend, in some measure, upon the circumstances of the particular state in which they appear. In the slave-holding states, publications of a tendency to excite commotions among the blacks are liable to punishment.

PRESS OF SAIL signifies as much sail as the then state of the wind, &c., will permit a ship to carry. See *Navigation*, and *Ship*.

PRESS-GANG; the name given in England to a detachment of seamen, who (under the command of a lieutenant) are empowered, in time of war, to take any seafaring men, and oblige them to serve on board the king's ships.

PRESS, PRINTING. See *Printing*.

PRESTER JOHN. In the middle ages, it was reported by travellers, that there was a Christian prince who reigned in the interior of Asia, under this name, and the same story was also known to the crusaders. Albert of Aix, and Otho of Freisingen, speak of him in the twelfth century; Rubruquis, in the thirteenth century, attributes the name of *Prester John* to a Nestorian prince, Ungkhan, who had reigned in Caracorum, over two Mongol tribes, and perished in a war against Gengis Khan, above half a century before the time of his journey. (See *Nestorians*.) Other travellers of the thirteenth century also mention this personage, and Giovanni di Montecorvino, bishop of Cambalu, is said to have converted (1305) a prince of his house to Christianity. Who this Prester John was, it is not easy to decide; the supposition that he was the Dalai Lama, or one of the chief priests of the Lamaites, does not agree with the position assigned to his residence by the travellers, nor does any of the etymological explanations, which have been proposed, seem satisfactory. The most ludicrous mistake on this subject was that made by the Portuguese in the fifteenth century, who picked up a story of a Christian prince in the interior of Africa, whose name was Ogan, and who was in fact the negus (king) of Abyssinia. In consequence of the resemblance of the names *Ogan* and *Ungkhan*, they transferred the throne of Prester John from Asia to Africa, and gave the name to the Abyssinian prince.

PRESTO (*Italian*); quick, used in music to designate the fifth chief degree of musical motion, quicker than *allegro*. *Presto assai* denotes very quick, and *prestissimo* the highest degree of quickness.

PRESTON; a borough town in Lancashire, England, on the Ribble, thirty-one miles from Liverpool. The population, in 1790, was 6000, and had been nearly stationary for a century; but, in 1791, a small muslin manufacture was established there by a Mr Horrocks, which, with some other cotton works, formed by the same individual, soon rendered it one of the most flourishing places in the kingdom. In 1801, the population was 11,887, in 1821, 24,575, and in 1831, 33,112. The streets are broad and well paved, and there are churches for almost all denominations of Christians. Before the Reform Bill, the town sent two representatives to parliament, who were elected by every male inhabitant, whether house-keeper or lodger, who had resided six months in the town, and had not been chargeable to any township as a pauper for twelve months.*

PRESTON, THOMAS, an English dramatic writer, who flourished in the earlier part of the reign of Elizabeth. He was educated at Cambridge, where he succeeded to a fellowship. He was afterwards created a doctor of civil law, and appointed master of Trinity-hall, over which he presided fourteen years. He wrote one dramatic piece, entitled a Lamentable Tragedy, full of pleasant Mirth, conteyning the Life of Cambises, King of Percia, &c.—a sad tissue of fustian, which escaped not the satire of Shakespeare, who, in Henry IV., makes Falstaff talk of speaking in Cambyses' vein. Preston died in 1598.

PRESTON-PANS; a village eight miles east of Edinburgh, where the royal troops under the command of Sir John Cope were defeated, in 1745, by the Highlanders, who fought for the Pretender, Charles Edward. See *Edward, Charles*.

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* Voters of this kind were called *potwallopers*, or *potwallers* (from *wallop*, to boil), a term which includes all persons who *boil their own pot*, or cook their own victuals. Taunton, a borough in Somersetshire, with a population of 8700, likewise returned two members, chosen by the *potwallopers* of the borough.

PRETENDER. See *Edward, Charles;* and *Stuart, James Edward Francis.*

PRETOR; the principal Roman magistrate, next after the consul. The administration of justice devolved upon him. This office was established 389 years after the building of the city, because the consuls were too much occupied by the almost uninterrupted series of wars, to attend to that duty. In the year 418, plebeians were admitted to the pretorship. The pretor was chosen in the same manner as the consuls, and was therefore called *collega consulum*. At first there was only one; but as the business increased through the influx of strangers, a second was added, in the year of Rome 510. The duties were divided between them by lot, the one trying causes between citizens (*prætor urbanus*), the other between citizens and foreigners (*prætor peregrinus*). In 527, two additional ones were chosen to administer justice in the provinces of Sicily and Sardinia, which were conquered at that time. In 557, when the Roman dominion was extended over Spain, two more were added, so that the whole number was now six. Sylla increased their number to eight, and Cæsar to ten. Under the emperors their number varied. The distinctions of the pretor were, six lictors who carried the *fasces* before him, the *toga prætexta*, and a *sella curulis*, on which he sat while administering justice. A spear, or, if he was holding a public court, a sword, was placed before him, as the emblem of his judicial character. The principal business of the pretor was the administration of justice. On his entrance into office, he swore to respect the laws, and published an edict, stating the rules according to which he should administer justice for the ensuing year (*edictum, formula prætoris*). He chose from the legal ranks a sufficient number of persons to be judges during his continuance in office. The *prætor urbanus*, who was the first in rank, took the place of the consuls in their absence; he presided in the assemblies of the people, and, in case of emergency, convened the senate. The care of some of the public games also devolved on him, as the Apollinarian, the Circensian, and the Megalensian. The office of pretor continued for a year, after the expiration of which he went into the province assigned him, as pro-pretor.

PRETORIANS. In the times of the republic, the *cohors prætoria* was a body of troops selected to guard the person of the commander (in old Latin, *prætor*), while in active service. But Augustus established a standing body-guard, consisting of three cohorts, called *pretorians*, which were stationed in the city. This number was afterwards increased to nine, and a body of horse was finally added. Under Tiberius, a fixed station (*castra prætoria*, or *prætoriana*, or *prætorium*) was assigned them. Under the later emperors, particularly from the time of Commodus, they often deposed and murdered the emperors, and raised their favourites, or even (as in the case of Didius Julianus) the highest bidder, to the throne of the Cæsars. Their commander (*præfectus prætorio*) became the most important officer in the state, having, from the beginning of the third century, not only the command of the guards, but the administration of the finances, and an extensive criminal jurisdiction,—a natural consequence of the growth of military despotism. The pretorian guards were abolished by Constantine the Great.

PRETRES INSERMENTES. See *Priests, Nonjuring.*

PREVESA; a town of Albania, sangiacat of Janina, on the northern side of the gulf of Arta; lat. 39° 5′ N.; lon. 20° 33′ E.; eight and a half leagues from Arta, and not far from the ruins of Actium. In 1684, the brave Venetian admiral Morosini took from the Turks Santa Maura, Prevesa, Butrinto, Parga, Arta, and Voinitza, and thus rendered Venice mistress of the Ambracian gulf. In 1797 these places were ceded to the French republic, and when the latter became involved in a war with Turkey, Ali, pacha of Janina, took Prevesa by storm (1798), pillaged the city, and put to death the greater part of the male population, in violation of express stipulations. By the peace of Luneville, Austria and France formally ceded Prevesa, Parga, Voinitza, and Butrinto (Buthrotum) to the Porte. (See *Parga.*) Prevesa again suffered by the rebellion of Ali, whose son threw himself into the citadel, and thus subjected it to a long blockade. In 1825, it also suffered by an earthquake, which did much damage in Santa Maura.

PREVILLE, PIERRE LOUIS DUBUS DE, a distinguished French actor, born at Paris in 1721, was designed for the church, but ran away, and, after serving as a journeyman mason, joined a company of players, and performed at Strasburg, Dijon, Rouen, and finally became manager of a company at Lyons. In 1773, he made his *début* at Paris, at the *théâtre Francais*. Armand favoured his first appearance at the theatre of Fontainebleau, which decided his reputation. He played five different parts in the *Mercure galant*. Louis XV., who had a good taste, was so struck with his performance, that he ordered him to be received among his own players. Preville's acting was excellent, and he shone not only in humorous parts, but in pathetic scenes. He left the theatre in 1786, but afterwards made his appearance again to relieve some of his companions, who had been reduced to distress by the revolution. He died blind at Beauvais in 1799.

PREVOST D'EXILES, Antoine François, a French writer, born in 1697, studied with the Jesuits, and entered the order, which, however, he soon quitted for the military service. Dissatisfied with the slowness of promotion, he again joined the Jesuits, but, after a short time, once more returned to the career of arms, and served with reputation. Disappointed love next caused him to assume the habit of the Benedictines of St Maur, and he retired to St Germain des Prés, where he found consolation in study. His restless temper soon led him to separate himself from the Benedictines, and, in 1729, he went to Holland, and was thrown upon his own resources for subsistence. Here he published his *Mémoires d'un Homme de Qualité*, and, having formed a connexion with a young woman, he went over to England. In 1734, he returned to France, and was appointed almoner and secretary to the prince of Conti. The chancellor d'Aguesseau also selected him to superintend the *Histoire générale des Voyages*. As he was one day walking in the forest of Chantilly, he was attacked by a stroke of apoplexy. Having been found in a state of insensibility by some peasants, the public officer proceeded to open the body of the supposed deceased, when he opened his eyes; but the wound was mortal. This event occurred in 1763.—Besides the works already mentioned, are his *Histoire de M. Cleveland, Histoire du Chévalier des Grieux, et de Manon Lescaut*, with several other romances, and numerous translations from the English of Richardson, Hume, &c.

PREVOT, COURS PREVOTALES. Several officers bore the name of *prévôt* in France previous to the revolution. The *grand prévôt de France*, with two deputies (*lieutenants généraux civils, criminels et de police*), exercised jurisdiction in the royal palace and household; the *prévôt des merchands* at Paris and Lyons was the first magistrate of the city. The *prévôt de Paris*, as governor of the *châtelet*, was the chief judicial officer, head of the knights of the town, and its dependent territory, and of the *vicomté* of Paris, and was the *bailli* of the university. The *prévôts des maréchaux de France*, who were lately restored for a time under the name of *cours prévôtales*, were guardians of the public peace, and exercised a rather summary justice over vagabonds, robbers, gipsies, and disturbers of the public peace (house-breakers, highway robbers, rioters, counterfeiters, etc.). The nobles, and most of the officers of government, were not amenable to their jurisdiction, which was so badly administered (for the *prévôts* were not jurists), that the celebrated chancellors L'Hopital and D'Aguesseau restricted their authority by the ordinances of 1505 and 1731; and, in 1790, it was entirely abolished. But Napoleon found that the ordinary courts were insufficient to maintain the strict control which he desired over public order. Of this he took advantage to extend his power. By the law of March 3, 1810, concerning prisons of state, he received the power of confining dangerous persons, without trial, in those prisons. In 1800, the foundation had already been laid for the erection of special tribunals, which the new criminal organization of 1808 confirmed, with new developments. In these special tribunals the president of the court of assizes, with four counsellors and three military men, were to judge vagrants (*gens sans aveu*) for all manner of crimes; and, in case of rebellion, armed smuggling, counterfeiting, and murder, by numbers, the trial was to be without jury, and in a summary form. The imperial decree of April 6, 1809, added to the above specified acts that of having borne arms against Napoleon since September 1, 1804. By the law of April 20, 1810, government was authorized to establish extraordinary special tribunals, for the term of one year, composed of eight members of the court of appeals, in those departments in which certain crimes were unusually frequent. For the trial of smugglers, by an imperial decree of October 18, 1810, *cours de douanes* were established in thirty-six cities, and *cours prévôtales des douanes* in eight cities; the latter had a *grand-prévôt* for president, with eight assistant judges, and in cases of armed smuggling had original jurisdiction, and proceeded without jury. All these extraordinary tribunals, together with the military commissions, were abolished by the charter of 1814 (art. 63), with a proviso for the restoration of the *cours prévôtales*, should it be found necessary. By the law of December 20, 1815, the special criminal courts were re-established, for two years, under the name of *cours prévôtales*. One of these courts was erected in each department, consisting of a jurist as president, a military officer as *prévôt*, and four members of the court of the first instance in the district. Their jurisdiction resembled that of the special criminal courts constituted in 1808, and their procedure was exactly the same. They were not renewed, and therefore tacitly expired in 1818. The article of the charter above referred to (54th in the new charter) was so amended August 7th, 1830, as to read thus: "There can be no extraordinary commissions or tribunals, under any title or name whatsoever," the proviso in favour of the *cours prévôtales* being struck out.

PRIAM; son of Laomedon and Strymo or Placia, called, in his earlier years, *Podarces;* but when Hercules took Troy, and permitted Hesione to ransom one of the prisoners at her own price, she selected her brother Podarces, and gave her veil for him. On this account he was ever after called *Priam* (the Ransomed). When a youth, he marched with the Phrygians against the Amazons, and went as ambassador to the Thracians. After the death of his father he reigned in Troy. By his first wife, Arisbe, daughter of Merops, he had Æsacus. He afterwards gave Arisbe to Hyrtacus, and married Hecuba, by whom he had, according to Homer, nineteen children, among whom Hector, Paris, Creusa, Laodice, Polyxena, Cassandra (Alexandra), Deiphobus, Helenus, Pammon, Polites, Antiphus, Hipponous, Polydorus and Troilus were the most distinguished. By four concubines, he also had thirty-sons and four daughters. His name has been rendered famous by the tragical fate of himself and his family, brought on by his blind love for his son Paris; for when he was extremely old, the Greeks demanded of him the restoration of Helen, who had been carried away by Paris, and, on his refusal to give her up they made war against Troy, took and destroyed the city, after a siege of ten years, his son Hector (q. v.) having already fallen before his eyes. In this night of horror the old man armed himself to seek death in the midst of the enemy; but the prayers of Hecuba prevailed upon him to take shelter at the altar of Jupiter. Here he saw his son Polites fall by the hand of Pyrrhus; and, unable to contain himself, he hurled his javelin at the youthful warrior, who dragged the old man by the hair to the altar, and plunged a sword into his breast.

PRIAPUS; originally a god of the fields in Lampsacus, a town of Mysia, situated in a rich wine country. Venus bore him to Bacchus, when the latter was returning from India, but was unwilling to acknowledge him, on account of his deformity. Others give him a different origin; but he was always god of the fields, the protector of gardens, bees, goats, and sheep. He was represented with horns and goat's ears, and large sexual parts, having in his lap all kinds of fruits; in his hand he held a sickle, and usually a horn of plenty. His worship spread from Lampsacus over Greece to Rome. Some mythologists consider him an emblem of nature.

PRICE, RICHARD; a dissenting minister, distinguished as a mathematician and statistical writer. He was born at Llangunor, in Glamorganshire, in 1723, and was educated at Talgrath, in his native county, whence he removed to a Presbyterian academy in London, and became pastor of a nonconformist congregation, of Arian or semi-Arian principles, at Hackney, where he continued as long as he lived. He commenced his literary career in 1758 by his Review of the principal Difficulties in Morals (8vo.), which was followed by Four Dissertations on the Importance of Christianity, the Nature of Historical Evidence, and Miracles, &c. (1767, 8vo.). In 1769, he received the diploma of D. D. from the University of Glasgow. In 1771 appeared his Observations on Reversionary Payments and Annuities (8vo.), which established his character as a mathematical calculator. He next published an Appeal to the Public on the Subject of the National Debt; and during the contest with the North American colonies, advocated their cause in Observations on Civil Liberty (1776, 8vo.), Additional Observations, and a Supplement. These tracts provoked the animadversions of a number of writers on the opposite side of the question, and exposed him to some obloquy, but they also procured him a vote of thanks from the corporation of London presented in a gold box. He engaged in an epistolary correspondence with his friend doctor Joseph Priestley on the subjects of materialism and necessity, the substance of which was laid before the public in an octavo volume, in

1778. When Pitt became prime-minister, he consulted doctor Price, in his schemes for the reduction of the national debt; and the establishment of the sinking fund was the result of his recommendation. (See *Sinking Fund.*) At the commencement of the French revolution, in a sermon (published in 1789) On the Love of Country, he warmly expressed his delight at the emancipation of the French people. This discourse produced Burke's Reflections, in which doctor Price was severely treated. He died April 19, 1791. Besides many papers in the Transactions of the Royal Society, of which he was a fellow, he published Sermons on the Christian Doctrine, as received by the different Denominations of Christians (8vo), and several single sermons and political pamphlets.

PRICE. See *Value.*

PRICKLY PEAR. This term is frequently applied to various species of *cactus*, but more commonly to the *C. opuntia*, a fleshy and succulent plant, destitute of leaves, covered with *fasciculi* of spines, and consisting of flattened joints, inserted upon each other. The flowers are pretty large, yellow, having numerous petals and stamens. They are succeeded by a purplish and edible fruit.

PRIDEAUX, HUMPHREY, a learned English divine, born in 1648, was educated at Oxford, and, while at the university, published the ancient inscriptions from the Arundel marbles, under the title of *Marmora Oxoniensia*. Lord chancellor Finch, earl of Nottingham, gave him a prebend in Norwich cathedral, and lord North bestowed on him the rectory of Bladen, which, on taking the degree of D. D., he exchanged for the benefice of Soham, in Norfolk. He was subsequently promoted to the archdeaconry of Suffolk, and, in 1702, made dean of Norwich. His death took place November 1, 1724. Besides his great work entitled the Old and New Testament connected in the History of the Jews and neighbouring Nations, of which there are many editions, he was the author of the Life of Mohammed (8vo.); the Original and Right of Tithes (8vo.); Ecclesiastical Tracts (8vo.), &c.

PRIESTLEY, JOSEPH, an eminent philosopher and divine, was born in March, 1733, at Fieldhead, near Leeds. His father was a clothier, of the Calvinistic persuasion, in which he was also himself brought up, under the protection of an aunt, who, after he had attained a respectable degree of classical acquirement in several schools of the neighbourhood, finally placed him at the dissenting academy at Daventry, with a view to the ministry. He spent three years at this school, when he became acquainted with the writings of doctor Hartley, which made a great impression upon his mind; and he was gradually led into a partiality for the Arian hypothesis. On quitting the academy, he accepted an invitation to become minister of Needham Market, in Suffolk, when, being suspected of heretical opinions, he received little encouragement; and, after a residence of three years, he undertook the charge of a congregation at Namptwich, in Cheshire, to which he joined a school. Here his reputation increased; and, in 1761, he was invited by the trustees of the dissenting academy at Warrington to occupy the post of tutor in the languages. At Warrington, his political opinions were manifested in an Essay on Government. He also published an Essay on a Course of Liberal Education, and his useful Chart of Biography. A visit to London having introduced him to doctors Franklin, Watson and Price, he was encouraged to compose a History of Electricity, which first appeared in 1767, and procured him an admission into the royal society; he had previously obtained the title of doctor of laws from the university of Edinburgh. In the same year, he accepted an invitation to preside over a congregation at Leeds, where his religious opinions became decidedly Socinian. At Leeds his attention was first drawn to the properties of fixed air; and here he also composed his History and Present State of Discoveries relating to Vision, Light, and Colours. After a residence of six years at Leeds, he accepted an invitation from the earl of Shelburne, afterwards marquis of Lansdowne, to reside with him as a companion, in the nominal capacity of librarian. While forming a part of the establishment of this nobleman, he occupied himself in scientific pursuits, and, in 1773, gave to the Philosophical Transactions a paper on the different kinds of air, which obtained the prize of Copley's gold medal. This was followed by three volumes, the publication of which forms an era in the history of aeriform fluids. In 1775, he published his Examination of the Doctrine of Common Sense, as held by doctors Reid, Beattie and Oswald, and soon after published the treatise of Hartley. He had already declared himself a believer in the doctrine of philosophical necessity, and, in a dissertation annexed to his edition of Hartley, expressed some doubts of the immateriality of the sentient principle in man. This doctrine he still more forcibly supported in his Disquisitions on Matter and Spirit (1777); and the obloquy which these works brought on him producing a coolness in his patron, the connexion was dissolved, the doctor retaining an annuity of £150 per annum, by original agreement. He next removed to Birmingham, where he became once more minister of a dissenting congregation, and occupied himself in his History of the Corruptions of Christianity, and History of the early Opinions concerning Jesus Christ. His Familiar Letter to the Inhabitants of Birmingham was written in support of the claims of the dissenters for a repeal of the test acts. The era of the French revolution added to the usual animosity of theological dispute. The anniversary of the capture of the Bastile being celebrated at Birmingham, a mob assembled, and although doctor Priestley was not present, proceeded to his house, which, with his library, manuscripts and apparatus, fell a prey to the flames. The outrage was countenanced by too many exercising both lay and clerical influence, and the legal compensation which he obtained fell considerably short of his real losses. On quitting Birmingham, he was chosen to succeed his friend doctor Price at Hackney, where he remained some time in the cultivation of his scientific pursuits, until, finally, goaded by party enmity to seek an asylum in the United States, which he reached in 1794, and took up his residence at Northumberland, in Pennsylvania. In America he dedicated his whole time to his accustomed pursuits, until a severe illness laid the foundation of a debility in his digestive organs; and a gradual decay followed, which terminated his existence, February 6, 1804, in his seventy-first year. He had composed, not long before, his Jesus and Socrates compared. Doctor Priestley was an ardent controversialist, chiefly in consequence of extreme simplicity and openness of character, but no man felt less animosity towards his opponents than he did; and many who entertained the strongest antipathy to his opinions were converted into friends by his gentleness and urbanity in personal intercourse. As a man of science, he stands high in the walk of invention and discovery; and to no one has pneumatic chemistry been so much indebted. As a metaphysician, his elucidation of Hartley's theory of association, his works upon philosophical necessity and upon materialism, will always ensure attention. As a theologian, doctor Priestley, who followed his convictions wherever they led him, passed through all changes, from Calvinism to a Unitarian system, in some measure his own; but, to the last, remained a zealous opposer of infidelity. Of his theological and controversial productions, those most generally esteemed are his Institutes of Natural and Revealed Religion, and Letters to a philosophical Unbeliever. He also wrote many works of practical divinity. His works amount to about seventy volumes, or tracts, in octavo. (See his *Life*, by himself and his son.)

PRIESTS; officers called by choice or birth to perform religious rites, and to inculcate and expound religious dogmas. Among the ancient pagan nations, all that was dignified and venerable, that deserved respect and obedience, that stood nearer to the Divinity than the common mass of mortals, was associated with the idea of the priestly office. The patriarch of the primitive world was at once the king and the priest of his family; and when the state was developed from the family, the royal and priestly dignity still continued, for a long time, to be united in the same person. (See *Melchisedek*, and *Patriarchs*.) But these offices became separated in those states of antiquity which owed their existence to the ascendency of single heroes or conquering tribes; and by the side of the regal dignity and sovereignty a sacerdotal order, which in some countries was elective, in others hereditary, grew up, and by the reputation of superior wisdom, and secret communion with the gods (whence the priests were also honoured as magicians and physicians), inspired the mind with awe. In the states of Western Asia, in Egypt, Greece, and Rome, the priests were therefore public councillors, and instruments of government. Their original office was to bring down divine things to the conception of men (the origin of most of the mythuses may therefore be referred to their explanations of symbols and emblems), and to solemnize the public worship of the gods by sacrifices, prayers, and religious pomp (mysteries). Instruction and the interpretation of symbolical doctrines ceased to be a part of their office when the mythical religions system came to an end; and when the poets, rhetoricians, and philosophers assumed the office of interpreters of the mythuses, the sole business of the priests became the performance of the religious rites. The Mosaic constitution exhibits them in this stage of development, and, while it clothes them with great power, reserves the spiritual part of religion to the prophets. (See *High Priest*, and *Theocracy*.) The posterity of Aaron, the hereditary priests of the Hebrews, became, therefore, mere mechanical agents in the daily repetition of the temple service. It fared no better with the Roman Catholic clergy when they adopted the rigour and formalities of the Jewish priesthood, with the view of obtaining the same privileges, and exacting from the Christian laity the same contributions (e. g. tithes) which the Levites had enjoyed. Such a tendency was altogether foreign from the Founder of Christianity and its apostles. The primitive Christian communities had, indeed, teachers, whose duty it was to expound the divine word, and to exercise a paternal care over their disciples; but not to perform pompous ceremonies, nor to rule over the conscience. Some of these teachers were called *presbyters*, whence the term *priest*, in our language, is derived (see *Presbyterians*); but they were by no means priests in the sense of the word which prevails at present. In the Catholic church, *priests* are that order of the clergy who perform the holy office of the mass, and in some of the Protestant churches, those who administer the sacraments, preach, &c. (See *Hierarchy*, and *Ordination*.) Among the Hindoos, the sacerdotal caste styled *Bramins* form the highest caste. (See *Bramins*, and *Caste*.) In the systems of Lamaism and Mohammedanism, the dalai-lama and the caliph are the heads of the priesthood. (See *Lama*, and *Caliph*.

Priests, Non-juring, or Prêtres Insermentés. The schism in the French church, produced by the *constitution civile du clergè* of the 12th of July, 1790, was connected with the old relations of that church with the Roman see and the French government, and of these latter with each other. Louis IX., by his pragmatic sanction (1268), defended the rights of election against the see of Rome, and restricted the pecuniary exactions of the latter. By the concordate of Leo X. with Francis I. (1516), the right of appointing the bishops and prelates was secured to the king, and that of receiving the annates, to the pope; at the same time, an opportunity was afforded to the nobles, by requiring of them a shorter period of preparation, to exclude the learned class, who were really the clergy, from the higher and more profitable ecclesiastical offices. By a royal edict of 1606, this exclusion of the learned was completed, and those abuses introduced, which in connexion with the licentiousness and immorality of some of the higher clergy, contributed to produce the revolution. The immense revenues of the Gallican church were not applied to spiritual purposes, but merely to supply to the younger sons of nobles the means of leading dissipated and dissolute lives, while the real labourers in the church—the priests—were obliged to live, for the most part, on very moderate, and often scanty incomes. The declaration of the French clergy of 1682 (denying the personal infallibility of the pope and his power to interfere in secular affairs), the Jansenist controversy, and the bull Unigenitus (1713), had introduced divisions into the church. It was no wonder, then, that when, in 1788, the government itself called the people to a great political reform, the church should have been one of the first objects of attention. The first step was to declare the possessions of the church national property, which after supplying the necessary wants of the church, was to be employed for purposes of state. The relations of the state to the Catholic church were afterwards entirely changed by the civil constitution of the clergy above mentioned. The 135 bishoprics, which were of very unequal extent, were reduced to eighty-three, one for each department, and the whole country was divided into ten archbishoprics. The ten archbishops were to have their seats at Rouen, Rheims, Besançon, Rennes, Paris, Bourges, Bordeaux, Toulouse, Aix, and Lyons. The bishops were to officiate as the curates of their sees; the priests and bishops were to be chosen by the people; the canonical consecration was to be performed by the bishop or archbishop (the archbishop being consecrated by the oldest bishop in the archbishopric). The pope, as the visible head of the church, was merely to be informed after the choice had taken place, without any confirmation from him being necessary; and all the bishops, both those in office at the time and those who should thereafter be chosen, were to take an oath "to watch over the congregations committed to them, to be faithful to the nation, the law, and the king, and to support the constitution, which should be framed by the national assembly and accepted by the king." Most of the old prelates and many of the priests refused to take this oath. Such refusal was declared equivalent to a resignation, and others were chosen to supply their places. The non-juring clergy formed one of the most powerful means of opposing republicanism in France; they kindled the war in La Vendée; the greatest part of them emigrated, and published excommunications and charges of heresy, particularly from England, against those who had submitted to the new order of things. The national convention opposed these attacks by the most rigorous measures. Several hundreds of the clergy, who refused to take the oath, were murdered in the prisons of Paris, on the 2nd and 3rd of September, 1792. The revolutionary tribunal endeavoured to extirpate them from the republic. Carrier drowned fifty-eight at once, at Nantes; and a law was passed condemning them to deportation *en masse*. Even those servants of religion who had submitted to the civil constitution were not suffered to live in peace; religion itself had become hateful to political fanaticism. This violence was carried so far, that the constitutional bishop of Paris, John Baptist Joseph Gobel, a man sixty-seven years of age, who had been educated at Rome, and had been suffragan of the bishop of Basle (since 1772), appeared at the bar of the convention, acknowledged himself an impostor, who had hitherto deceived the people with doctrines which he did not believe himself, and tore off the badges of his sacred office. He was soon after guillotined. This madness, however, did not long continue. Some constitutional bishops obtained from the national convention, in 1794, the declaration of freedom of conscience, and entered into an association with their clerical brethren. The consequence of this was the national councils of 1797 and 1801, the acts of which were printed; and their principles, founded on the *constitution civile*, met with approbation from many foreign bishops, particularly the Italian. Of the 40,000 parish churches of France, 32,214 were again opened in 1796, and almost all were filled by priests who had taken the oath (*pétres assermentés*). The French church was far advanced towards independence, when the revolution of 1799, and the concordate of 1801, in which Napoleon sought to make the church a support to his power, restored its old connexion with Rome. The result showed how much Napoleon erred in this policy.

PRIMAGE, is a small allowance made by the shippers to the master of a freighting vessel, for his care and trouble in respect to the cargo. It is usually confounded with average (see *Average*) in the bill of lading, and both are estimated at a certain rate per cent. on the amount of the freight.

PRIMARY. See *Ornithology*.

PRIMARY ROCKS. See *Geology*.

PRIMATE (*primas regni*, head of the kingdom); in the European states, the chief archbishop in the state, and the first subject of the realm; in the Catholic church, the primate is also perpetual legate of the pope, and has a sort of spiritual jurisdiction over the other archbishops. There are also primates of provinces. The archbishop of Toledo is primate of Spain; the archbishop of Braga is styled primate of Portugal, although he is actually inferior to the patriarch of Lisbon. In England, the archbishop of Canterbury is styled primate of all England, and the archbishop of York primate of England. In the Protestant Irish church, the archbishop of Armagh is primate of all Ireland; the archbishop of Dublin, primate of Ireland; the archbishop of Cashel, primate of Munster, and the archbishop of Tuam, primate of Connaught. In the German empire, the archbishop of Salzburg was primate of Germany. In France, the archbishop of Lyons is primate of France; that of Bourges, primate of Aquitania, and that of Rheims, of Normandy. In Hungary, the archbishop of Gran is primate; in Poland, the archbishop of Gnesen.

PRIMATICCIO, Francesco, a painter of the Bolognese school, born at Bologna in 1490, received his first instruction from Innocenzo da Immola, and completed his studies under Giulio Romano. In connexion with several of the pupils of the latter, he painted the *Palazzo del Tè*, in Mantua (q. v.), from Giulio's designs. Through the recommendation of Frederic, duke of Mantua, Primaticcio was taken into the service of Francis I. of France, in 1531. His arrival and residence in France makes an epoch in French art. To his influence were owing, not only numerous paintings in fresco, and works in stucco, which the king caused to be executed, but several branches of painting, as, for instance, enamel painting, and designs for tapestry, were carried to great perfection through his exertions. Francis sent him to Italy to purchase antique statues, of which he made a respectable collection, and caused numerous casts to be executed. On the death of Rosso, the royal painter, Primaticcio succeeded him in his post, and Francis II. appointed him superintendent of the royal buildings. He furnished the designs of several architectural works, among them of the tombs of Francis I. and Henry II. His works at Fontainebleau, however, gained him more reputation. He was assisted in his labours by several of his countrymen, of whom Niccolo del Abbate was the most distinguished. Primaticcio died in 1570. The works which he executed in France are nobler and freer, in point of design, than those which he executed in Giulio's school. In his great works he often violated nature.

PRIME MINISTER, or PREMIER. See *Minister*.

PRIME NUMBERS are those which have no divisors, or which cannot be divided into any number of equal integral parts, less than the number of units of which they are composed; such as 2, 3, 5, 7, 11, 13, 17, &c. These numbers have formed a subject of investigation and inquiry from the earliest date down to the present day; and a rule for finding them is still amongst the desiderata of mathematicians. The method of finding a prime number beyond a certain limit, by a direct process, is considered one of the most difficult problems in the theory of numbers, which, like the quadrature of the circle, the trisection of an angle, and the duplication of the cube, have engaged the attention of many able mathematicians, but without arriving at any satisfactory result.

PRIME VERTICAL, is that vertical circle, or azimuth, which is perpendicular to the meridian, and passes through the east and west points of the horizon.

PRIME VERTICALS, in dialling, or PRIME VERTICAL DIALS, are those that are projected on the plane of the prime vertical circle, or on a plane parallel to it. These are otherwise called *direct*, *erect*, *north*, or *south* dials.

PRIMER. *Great primer*, and *long primer*, are different kinds of type. See *Type*.

PRIMITIVE ROCKS. See *Geology*.

PRIMOGENITURE. The right of primogeniture in males seems anciently to have prevailed only among the Jews. The first born in the patriarchal ages had a superiority over his brethren, and in the absence of the father, was priest of the family. Among the Jews, he had a double portion of the inheritance; in the same manner, as by the laws of Henry I. in England, the eldest son had the capital fee, or principal feud of his father's possessions, and no other pre-eminence; and as the eldest daughter had the principal mansion when the estate descended in coparcenary. The "insolent prerogative of primogeniture," as Gibbon denominates it, was unknown among the Romans; the two sexes were placed on a just level; all the sons and all the daughters were entitled to an equal portion of the patrimonial estate. The Greeks, the Britons, the Saxons, the Danes, &c., and even, originally, the feudists, divided the lands equally, some among all the children at large, some among the males only. The equal division of the patrimonial estate among the children is certainly the most obvious and natural way. When the emperors began to create honorary feuds, or titles of nobility, it was found necessary, in order to preserve their dignity, to make them impartible, and, in consequence, descendible to the eldest son alone. This example was further enforced by the inconveniences that attended the splitting of estates; namely, the division of the military services, the multitudes of infant tenants incapable of performing any duty, the consequent weakening of the strength of the kingdom, and the inducing younger sons to take up with the business and idleness of a country life, instead of being serviceable to themselves and the public, by engaging in mercantile, military, civil, or ecclesiastical employments. These reasons occasioned an almost total change in the nature of feudal inheritances; so that the eldest son began, universally, to succeed to the whole of the lands in all military tenures.

In this condition, the feudal constitution was established in England by William the conqueror. Before the conquest, the descent of lands was to all the sons alike. Socage estates in England frequently descended to all the sons equally, till the time of Henry III., when, in imitation of lands in chivalry, they had almost entirely fallen into the right of succession by primogeniture; except in Kent, where they gloried in the preservation of their ancient gavelkind tenure, of which a principal branch was the joint inheritance of all the sons; and except in some particular manors and townships, where their local customs continued the descent sometimes to all, sometimes to the youngest son only, or in other more singular methods of succession. By the English law, there is no right of primogeniture among females, except as to the inheritance of the crown. (Black. *Commentaries*, ii, 215.) The right of primogeniture, which calls the eldest born to the crown, was not introduced into France till very late; it was unknown to the first and second race of kings. The four sons of Clovis shared the kingdom equally among themselves. Those of Louis le Debonnaire did the same; and it was not till the race of Hugh Capet ascended the throne, that the prerogative of succession to the crown was appropriated to the first born. The right of primogeniture is now abolished in France; but it prevails in some degree in every other nation of Europe. In the United States, no distinction of age or sex is made in the descent of estates to lineal descendants. Though primogeniture and the preference of males are now thus universally given up in that country, yet in some states they remained in full force, and in others, modifications of them continued for a long period The English common law, with regard to descents, prevailed in New Jersey until 1780, in Maryland and South Carolina until 1786, and in Virginia until 1787. In Massachusetts, Rhode Island, and Connecticut, the eldest son, probably in imitation of the Jewish law, had formerly a double portion of the real and personal estate, and, in Delaware, of the real estate, of his father. (*Amer. Jurist*, No. I. 80.)

PRIMROSE (*primula*). A genus of beautiful low Alpine plants. Some are among the earliest flowers in spring, as the common primrose, the oxlip, and cowslip; and several are cultivated in gardens as ornamental plants. Their roots are perennial; the leaves almost always radical; and the flowers supported on a naked stem, and usually disposed in a sort of umbel. The calyx is tubular; the corolla funnel-shaped, and divided at the summit into five equal lobes; the stamens five in number, with a single style; and the capsule oval, one-celled, and containing numerous seeds attached to a central placenta. The varieties of the common primrose, which have arisen from cultivation, are very numerous. The *P. auricula*, a native of the Alpine regions of Italy, Switzerland, and Germany, is also a well known favourite with the florist.

PRIMUM MOBILE, in the Ptolemaic astronomy; the ninth or highest sphere of the heavens, whose centre is that of the world, and in comparison of which the earth is but a point. This the ancients supposed to contain all other spheres within it, and to give motion to them, turning itself, and all of them, quite round in twenty-four hours.

PRINCE EDWARD'S ISLAND. See *John's, St.*

PRINCE OF WALES'S ISLAND (called by the Malays *Pulo Pinang*, or *Betel-nut island*) is an island in the East Indian sea, near the coast of Siam; latitude of its north-eastern point, 5° 25′ N.; long. 100° 19′ E. It measures about 160 square miles, and has a fine harbour. Its basis is a mass of granite. The western side affords abundance of timber for ship-building. The remainder is extremely fertile, and yields large crops of pepper, coffee, sugar, rice, ginger, yams, sweet potatoes, betel-nut, cocoa-nut, spices, &c., and the elastic gum-vine, resembling the caoutchouc plant. The climate is temperate. George Town is the capital. Population of the island and its dependencies in 1822, 51,207.

PRINCE REGENT'S INLET. See *North Polar Expeditions.*

PRINCE WILLIAM'S SOUND; a long inlet of the sea, in the northerly regions of America, which incloses a large peninsula, claimed by Russia. The inhabitants of this and the neigbouring districts, of which the accompanying cut represents a family, are a peculiar race, square, stout, with large heads, broad flat faces, and hooked noses. They are clothed in long frocks of the skins of sea and land animals, usually with the hair outwards.

PRINCE'S METAL; a mixture of copper and zinc, in imitation of gold.

PRINCES OF THE BLOOD; those persons who have the same origin with the reigning house, and, after the extinction of the same, have the next right to the throne. Thus the princes of the houses Orleans and Bourbon Condé were formerly princes of the blood. Louis XIV. also declared his sons by his mistresses La Valiere and Montespan princes of the blood; but the dignity was taken from them after his death.

PRINCIPAL, in criminal law. See *Accessary.*

PRINTER'S INK. See *Ink.*

PRINTING, in a general sense, is the art of making impressions of figures, characters, or letters, with ink, upon paper, vellum, silk, or any similar substance; in a more particular sense, it is the term applied to that art by which, with single moveable letters or types, any piece of literary composition is converted into a book. Printing, in its extended sense, embraces wood and copperplate engraving, lithography, and even the decoration of calicoes; but as these branches of the art have already been treated of under their proper heads, we have only here to consider *Printing* in its most commonly received meaning, that is, Typography, or the art of printing paper with moveable metal types.

The first *approximation* to this most important art,—which has changed, more than any other human invention, the moral condition of the world,—was undoubtedly made by the Chinese. At what time their style of printing was introduced, it is impossible to determine; they themselves claim an antiquity for it long before the commencement of the Christian era, and it is denied by none, even of the Christian writers, that it was fully established in China early in the tenth century, nearly 500 years before printing was contemplated in Europe. The Chinese method of printing, which has remained unaltered for ages, is as follows: The work intended to be printed is transcribed upon thin, transparent paper; each written sheet is glued, with its face downward, upon a smooth block of wood; the engraver cuts the wood away in all those parts upon which he finds nothing traced, and thus leaves the transcribed parts ready for printing. Thus, there must be as many blocks as there are pages in a book, and these blocks are not of the least use in printing any other work. The system, however, has one advantage, but no other, in common with stereotype, that by it impressions of a work may be thrown off just as required.

Block-printing in Europe, with single pieces of wood, can be traced back as far as the thirteenth century. The introduction of playing-cards early in the fourteenth century, is supposed to have given an impetus to the art of wood-engraving. From single figures, the professors of the art came to engrave historical or biblical subjects, some with a text or explanation subjoined, others without a text. Of the former of these, the oldest and most celebrated extant is the *Speculum Humanæ Salvationis;* of the latter the *Biblia Pauperum.* (See a description and fac-similes of both in Horne's Bibliography.) These books of Images, as they were called, may be considered as the earliest attempts at book-printing in Europe; and although there is little likelihood that the practice of the art was derived from China, they resembled Chinese books in one essential point, each leaf being printed from single blocks of wood. The great discovery was yet to be made, which was to emancipate the art from its fixed thraldom, and give it a ductility and power beyond all previous conception—the discovery, namely, of the practicability and utility of adopting *moveable* types.

It is a matter of much dispute to whom is due the merit of making this, in its results, unparalleled discovery. Nor, after all that has been written on the subject, can a very distinct or satisfactory conclusion be attained. Many claims have been adduced, but the real question seems to lie between those of Laurence Coster of Haerlem, and John Guttenburg or Geinsfleisch of Mentz, all others being groundless or puerile. The advocates for Haerlem maintain, chiefly on the authority of Hadrian Junius, who flourished about a hundred years after the introduction of the art, that Laurence Jansoen, under the name of Coster (i. e. sacristan in the great parochial church at Haerlem) as early as 1430, not only practised the art of cutting on wooden tables, but made impressions with moveable types of wood, and afterwards of lead and tin. But no undoubted specimen of his work has come down to us, although the *Speculum Humanæ Salvationis* is said to be his; neither are his claims, on the whole, so satisfactorily established as those of Guttenburg. The best that can be said of him is, that he was, in all probability, an ingenious wood-engraver, who carried the practice of his art to a higher state of perfection than most of his contemporaries, and who even went so far as to employ separate wooden types in the construction of broadsides for alphabets, breviaries, &c. To Guttenburg, according to the opinion of the most numerous and competent judges, belongs the credit of having first employed moveable *metal* types in the production of *books*—of having, in short, been the first to supplant the ancient, tedious, and expensive method of manual transcription by letter-press printing. Guttenburg was a native of Mentz, but his early life was spent at Strasburg, and it is doubtful whether it was in the former or latter city that he first prosecuted his art. (See a notice of his life in this Encyclopedia, under *Guttenburg.*) The probability is, that he first conceived the idea of his invention, and made a few experiments of it at Strasburg, but that it was at Mentz, where, with the aid of Peter Schoeffer of Gronsheim, he first brought the art into practical use. Guttenburg left Strasburg for Mentz in 1445,* and from that period may be dated the commencement of the art of printing, although it has been proved that moveable letters in wooden blocks must have been used earlier than 1442. In 1449, Guttenburg connected himself with a rich citizen in Mentz, named John Fust (Faustus), who advanced the capital necessary to prosecute the business of printing. Soon after (probably in 1453) Peter Schoeffer, who afterwards became Fust's son-in-law, was taken into copartnership, and to him belongs the merit of inventing matrices for *casting* types, each individual type having hitherto been *cut* in wood or metal. This discovery is one of the most invaluable in the history of printing, and so much did it facilitate the art, that Schoeffer, before his death, which is supposed to have taken place about 1492, printed upwards of fifty works. The oldest work, of any considerable size, printed in Mentz with cast letters, by Guttenburg, Faustus, and Schoeffer, finished about 1455, is Guttenburg's Latin Bible, which is called the *Forty-two lined Bible,* because in every full column it has forty-two lines. Faustus, having separated from Guttenburg in 1456, and, by means of a loan of 2020 florins, having obtained his printing-press for his own use, undertook, in connection with Peter Schoeffer, greater typographical works, in which the art was carried to higher perfection. Faustus was particularly engaged in the printing of the Latin and German Bible, by the copying of which the monks had hitherto gained considerable sums. As they could not understand this astonishing multiplication of copies, and their still more astonishing uniformity, they ascribed the whole work to Satan. When, therefore, Faustus went to Paris with his Bibles (the first copies of which, bearing date, were printed in 1462), for the purpose of selling them there, such an outcry was raised against him by the monks, that he was obliged to leave the city in haste; and this circumstance probably gave rise to the well-known tradition that the devil had carried him off. Other authorities, however, say, that the legend of the Devil and Doctor Faustus is of older date than the invention of printing. In 1466, Faustus made a second journey to Paris, and died there of the plague, upon which Peter Schoeffer continued the printing business alone, at Mentz. After the separation of Guttenburg and Faustus, the former had found means to procure a new printing-press, and had struck off many works, of which the most remarkable is the Astrological and Medical Calendar (in folio, 1457), considered the first known work printed with the date annexed.

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* Among the authorities we consult, we find much discrepancy of dates, and we can only adopt those which appear best authenticated.

In 1462, the city of Mentz was taken and sacked by Adolphus, Count of Nassau, and this circumstance is said to have so deranged the establishment of Faustus and Schoeffer, that many of their workmen were obliged to seek employment elsewhere. They accordingly were dispersed into different countries, and carried with them the knowledge they had acquired under their former employers. From this period, printing made rapid progress throughout Europe. In 1465, we find works printed at Naples; and in 1467, Sweynheim and Pannartz, two of the most celebrated and extensive old printers, established themselves at Rome. In 1469, we find printing at Venice and Milan; in 1470, at Paris, Nuremberg, and Verona; and by 1472, the art had become known in all the important cities of the continent. In 1490, it had reached Constantinople, and by the middle of next century, had extended to Russia and America. Of its rise and progress in England and Scotland, we shall come to speak immediately.

At the invention of printing, the character of type employed was the old Gothic or German. The *Roman* type was first introduced by Sweynheim and Pannartz, at Rome, and the *Italic* by Aldus. Schoeffer, in his edition of Cicero *de officiis*, produces, for the first time, some Greek character, rudely executed, but the earliest complete Greek work was a grammar of that language, printed at Milan, in 1476. The Pentateuch, which appeared in 1482, was the first work printed in the Hebrew character, and the earliest known Polyglot Bible—Hebrew, Arabic, Chaldaic, Greek, Latin—issued from the press of Genoa, in 1516. In the early history of the art of printing, the most learned men were proud to act as correctors of the press, and not unfrequently their name was attached to the title-page, along with that of the printer!

The reader, who has not studied Bibliography, may here not be unwilling to learn a few of the marks which distinguished our earliest printed books. With regard to their forms, they were generally either large or small folios, or at least quartos: the lesser sizes were not in use. The leaves were without running title, direction-word, number of pages, or divisions into paragraphs. The character itself was a rude old Gothic mixed with Secretary, designed on purpose to imitate the handwriting of those times; the words were printed so close to one another, that they were difficult and tedious to be read, even by those who were used to manuscripts, and to this method; and often led the inattentive reader into mistakes. The orthography was various and often arbitrary, disregarding method. Words were subjected to frequent abbreviations, which in time grew so numerous and difficult to be understood, that there was a necessity of writing a book to teach the manner of reading them. Periods were distinguished by no other points than the double or single one, that is, the colon and full-point; but a little after there was an oblique stroke introduced, thus /, which answered the purpose of our comma. No capital letters were used to begin a sentence, or for proper names of men or places. Blanks were left for the places of titles, initial letters, and other ornaments, in order to have them supplied by the illuminators, whose ingenious art, though in vogue before, and at that time, did not long survive the masterly improvements made by the printers in this branch of their art. These ornaments were exquisitely fine, and curiously variegated with the most beautiful colours, and even with gold and silver; the margins, likewise, were frequently charged with variety of figures of saints, birds, beasts, monsters, flowers, &c., which had sometimes relation to the contents of the page, though often none at all: such embellishments were very costly; but for those who could not afford a great price, there were inferior ornaments, which could be done at a much easier rate. The name of the printer, place of his residence, &c. were either wholly neglected, or put at the end of the book, not without some pious ejaculation or doxology. The date was likewise omitted, or involved in some crampt circumstantial period, or else printed either at full length, or by numerical letters, and sometimes partly one and partly the other; thus, *one thousand* CCCC *and* lxxiiii, &c. but all of them at the end of the book. There were no variety of characters, no intermixture of Roman and Italic; these are of later invention; pages were continued in a Gothic letter of the same size throughout. 200 or 300 were at first esteemed a large impression; though, upon the encouragements received from the learned, their numbers increased in proportion. About 1469—70, alphabetical tables of the first words of each chapter were introduced, as a guide to the binder. Catch-words (now generally abolished) were first used at Venice, by Vindeline de Spire. The name and place of the inventor of signatures is doubtful; it appears they were inserted into an edition of *Terence*, printed at Milan, in 1470, by Anthony Zorat. In an edition of *Baldi Lectura super Codic., &c.* printed at Venice, by John de Colonia and Jo. de Manthen de Gherretzem, anno 1474, in folio, the signatures are not introduced till the middle of the book, and then continued throughout. Abbé Reve ascribes the first use of signatures to John Koelhof, at Cologne, in 1472. They were used at Paris, in 1476; and by Caxton, in 1480.

The art of printing was first introduced into England by William Caxton, who established a press in Westminster Abbey, sometime between 1471 and 1474. Caxton's claim to be considered the earliest printer in England has been satisfactorily proved, notwithstanding the discovery, about 1660, of a book purporting to have been printed at Oxford in the year 1468. This book is a small thin quarto, a copy of which is in the public library at Cambridge, bearing the following title:—"*Exposicio Sancti Jeronimi in Simbolum Apostolorum ad Papam Laurentium. Impressa Oxonii, et finita Anno Domini* M.CCCC.LXVIII.—XVII *die Decembris.*" The printer of this book is said to have been Frederick Corsellis, a foreigner, who brought his types from Haerlem; and those writers who have advocated the cause of Laurence Coster as the inventor of printing, have generally pronounced Corsellis to be the introducer of the art into England. But Dr Conyers Middleton, in his treatise on the origin of English printing, has clearly demonstrated, that the date affixed to the "*Exposicio*" must be a mistake, for the book itself bears unequivocal marks of belonging to a somewhat later period. Not to mention other matters of a technical nature which go to prove this, it may be enough to say that *signatures* are used in distinguishing the sheets of the work—a circumstance which does not characterize any other book with so early a date as 1468, signatures not having been adopted for several years later. From that date, also, till eleven years after, we have no production from the press at Oxford, and it is difficult to imagine how long a cessation of the Oxford press should have taken place, supposing the above date to be correct. The only satisfactory way of accounting for the matter is by assuming an X to have been omitted through mistake in the imprint of the "*Exposicio*," and that its true date was M.CCCC.LXXVIII (1478). Similar inaccuracies were by no means rare in the early history of the art. There is a Bible at Augsburg of the date 1449, instead of 1494, the two last figures being transposed. There is a Bible dated Paris, 1443; another, Lyons, 1446; and a third, Basil, 1450, although it is well known that printing was not practised at any of these places till several years later. Koelhoff, who printed at Cologne about the beginning of the sixteenth century, might be placed before even Coster or Guttenburg, for one of his books is dated "anno M.CCCC." (1400 instead of 1500) a C being omitted; and the celebrated Nicolas Janson, who printed at Venice between the years 1470 and 1480, has a work (the *Decor Puellarum*) dated M.CCCC.LXI. instead of M.CCCC.LXXI., an X being omitted.

But even though the date of the "*Exposicio*" were correct (of which there is little likelihood), and though, by some singular incident, one little book was printed in Oxford several years earlier than any in Westminster Abbey, still William Caxton must ever be considered as the father of English typography, not only as having been the first who successfully established the art in this country, but as having, by his learning, application, and ingenuity, done much towards its improvement and extension. He was born in the weald or wood of Kent about the year 1412, and would appear to have received a good education—a circumstance of unusual occurrence in these days, except among the titled and wealthy. "I am bounden," he says, "to pray for my father and mother, that in my youth sent me to school, by which, by the sufferance of God, I got my living, I hope truly." When about fifteen, he was put apprentice to William Large, a mercer of London, and afterwards mayor. The term *mercer* was given at this time to general merchants, trading in all kinds of rich goods, books included. After he had served his apprenticeship, Caxton became a freeman of the company of mercers and a citizen of London. Some subsequent years he spent in travelling in various countries on the continent of Europe. In 1464, he was appointed ambassador to the court of the Duke of Burgundy. It was at the request of the Duchess of Burgundy that he finished his translation of the "History of Troy." During his residence in the Low Countries, he acquired or perfected his knowledge of the French language, gained some knowledge of the Flemish, imbibed a taste for literature, and at great trouble and expense made himself master of the art of printing. It is conjectured that he consulted Zell and Olpe of the Cologne press (who had learned the art at Mentz) and Colard Mansion of Bruges as to the materials necessary for his office. He is supposed to have returned to his native country about 1471, but we have no account of his typographical labours till 1474, the date affixed to the "Game of Chess," which is generally considered the first book printed by Caxton, though Mr Dibdin thinks that the "Romance of Jason" was printed before it. Caxton was indefatigable in cultivating his art. The productions of his press amount to sixty-four. For a catalogue of them, and of the productions of other early printers, we refer to the Rev. Dr Dibdin's Typographical Antiquities, or to Dr Watt's Bibliotheca Britannica. Besides the labour necessarily attached to his press, he translated various works; among others, Virgil's Æneid, from the French, published with the title "The Recuyel of the Historyes of Troye," and Æsop's Fables, a copy of which is in the Bodleian Library. He seems to have been perplexed about the language he should use in his translations; for while some advised him to use old and homely terms, others, "honest and great clerks," he adds, "have been with me, and desired me to write the most curious terms that I could find—and thus, betwixt plain, rude, and curious, I stand abashed." In 1480, he published his Chronicle and his Description of Britain, which were both very popular, having been reprinted four times in the fifteenth and seven times in the sixteenth centuries. Among other books which he published, were two editions of Chaucer's Tales; and it speaks well for the discrimination of the father of English printing, that he seems highly to have admired and appreciated the father of English poetry. Caxton died in 1490-91, and was buried in the parish church of St Margaret, Westminster. Caxton distinguished the books of his printing by a particular device, consisting of the initial letters of his name, with a cipher between, which some imagine to stand for 74, and to refer to the first year of his printing in England. His first performances were very rude, the characters resembling those of English manuscripts before the conquest. Most of his letters were joined together; the leaves were rarely numbered, the pages never. At the beginning of the chapters, he only printed, as the custom then was, a small letter, to intimate what the initial or capital letter should be, leaving that to be made by the illuminator, who wrote it with a pen, with red, blue, or green ink.

Caxton's two most distinguished successors were Wynkin de Worde and Richard Pynson. The former, a native of the dukedom of Lorraine, served under Caxton, and after the death of his master, successfully practised the art of printing on his own account. The books which he printed are very numerous, and display a rapid improvement in the typographic art. He died in 1534. Pynson was a native of Normandy, and it is supposed that he also served under Caxton. The first book of his which is known with a date, states that it was printed "the V day Juyl. the yere of oure lord god. m.cccc.lxxxxiii. by me Richarde Pynson at the Temple-barre of london." How long he exercised the art, or when he died, is not exactly known. The works which he printed are neither so numerous nor so beautiful as those of Wynkin de Worde. He was the first printer, however, who introduced the Roman letter into England. To Wynkin de Worde and Pynson succeed a long list of ancient typographers, into which we cannot enter here. Their various works and characteristics will be found duly recorded and honoured in Dr Dibdin's splendid edition of Ames and Herbert's Typographical Antiquities. Before the middle of the sixteenth century, printing had reached a flourishing condition in England. In the reign of Henry VII. and his successor, English printers, we are told, had become "so skilful, as to print books as well as any beyond the seas."

The art of printing is said to have been introduced into Scotland shortly after Caxton's day by Flemish priests, who fled thither to avoid the persecutions at home. No book, however, is known to exist as having been printed in Scotland before the year 1500. The first Scottish printers of whom we have any authentic account, were, Walter Chapman, a merchant in Edinburgh, and Andrew Millar, a workman, who, in consequence of a patent from James IV., established a press at Edinburgh, in 1507, that is, fully thirty years after Caxton had settled in London. "In 1508," says Dr Irving, "they are known to have printed various pamphlets, a collection of which may be found in the Advocates' Library. The first volume of the *Breviarium Aberdonense* issued from their press in 1509; the second in 1510. Of this very rare book a complete and well-preserved copy belongs to the library of the university of Edinburgh. The establishment of printing-presses in the other principal towns of Scotland cannot be so easily traced. Knox's "Faithful Admonition unto the Professours of God's Treuthe in England" was, if we may credit the title-page, printed at *Kalykow* or Kelso. This work appeared in 1554. Aberdeen, the seat of a university, could not boast of a printing-press till a much later period. In the colophon of a poem (1635) on the death of Bishop Forbes, Edward Raban styles himself "*Master printer, the first in Aberdene.*" About the same year (1635) we find books printed in Glasgow. In 1536, Thomas Davidson printed, "in the Fryere's Winde," Edinburgh, the Chronicles of Scotland by Boethius, and in 1540, the works of Sir David Lindsay. Robert Leprevig printed extensively both at Edinburgh and St Andrews. Thomas Vautrollier was another old Scottish printer, who brought out, in 1585, Calvin's Institutes; in 1589, Tusser's Points of Good Husbandry; and in 1597, the Demonologie of King James VI.

In later days, Scotland has distinguished itself by the extent and beauty of its typographical productions. Ruddiman, who flourished at Edinburgh during the first half of the last century, was one of the most learned printers which any country has produced. The works which he edited and printed are numerous, and they are all remarkable for their accuracy. Edinburgh can boast of many other typographers who have exerted themselves successfully in ennobling the art; nor has Glasgow been behind in this labour of love. In Urie, in Robert and Andrew Foulis, in the Duncans, and others, the latter city has produced printers whose works are alike celebrated for their elegance and accuracy. (See the article *Glasgow*.)

It was long after the invention before printing was introduced into Ireland. In 1551, the Common-prayer was printed in Dublin, by Humfrey Powel, 4to, black letter, and this is the earliest recorded production of the Irish press. The College library catalogue affords but one piece printed there so early as even 1633. Indeed, until as far down as 1700, very few books were printed in Ireland. Alderman George Faulkner, who lived in the last century, may be considered as the father of Irish typography. At the present day, the presses of Dublin and some of the provinces produce very neat work.

Process of Letter Press Printing. In order to give a full account of the process of letter-press printing, it would be necessary to begin with a description of the operation of Type founding, and this we would have done in the present article had it not been, that original and valuable information will be furnished on this important yet hitherto ill treated of subject, under our article *Type Founding*. It is sufficient for the reader at present to know that every letter, point, and mark used in printing is cast (with one or two exceptions) on a distinct body or stalk, and that for the use of the printer numbers of these types are placed in boxes, in order, in a case, in such a way that any letter or point may be found with the greatest convenience.

These cases are mounted on a stand or frame, so that they may lie before the person who is to select the types, and the little cells or boxes are so arranged that those containing the types most frequently used, shall be nearest to the workman. As will be easily conceived, the sizes of the boxes are made larger or smaller according as the types which they contain are more or less frequently required.

The types consist of the letters of the alphabet, of which there are three kinds—

Large capitals, A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Small capitals, A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Lower case, a b c d e f g h i j k l m n o p q r s t u v w x y z

The above are Roman letters: we have the same in Italic, as

Large capitals, *A B C D E F G H I J K L M N O P Q R S T U V W X Y Z*

Small capitals, *A B C D E F G H I J K L M N O P Q R S T U V W X Y Z*

Lower case, *a b c d e f g h i j k l m n o p q r s t u v w x y z.*

Besides these there are many varieties of letter used, such as Old English, and imitations of manuscript letters, the mention of which could only be serviceable to the practical printer. A collection of types such as is necessary in ordinary circumstances for carrying on the printing of a work, is called a *fount*. A fount must contain not only a sufficient number of letters, points and figures, but likewise types to fill up spaces, and other peculiarities.

Types are of various sizes, the following being those commonly in use among British printers for regular book work. English; Pica; Small Pica; Long Primer; Burgeois; Brevier; Nonpareil; Pearl; Diamond. Of these various sizes, we may give specimens by printing a portion of the Lord's Prayer.

ENGLISH.
Our Father, which art in hea-
PICA.
Our Father, which art in heaven,
SMALL PICA.
Our Father, which art in heaven, hallow-
LONG PRIMER.
Our Father, which art in heaven, hallowed be
BURGEOIS.
Our Father, which art in heaven, hallowed be
BREVIER.
Our Father, which art in heaven, hallowed be thy
MINION.
Our Father, which art in heaven, hallowed be thy name.
NONPAREIL.
Our Father, which art in heaven, hallowed be thy name. Thy
PEARL.
Our Father, which art in heaven, hallowed be thy name. Thy kingdom
DIAMOND.
Our Father, which art in heaven, hallowed be thy name. Thy kingdom come. Thy

The size of type used in printing this Encyclopedia is brevier.

When a work is to be printed and the size of type and pages condescended upon, the copy is given to the compositor, who places it before him on the case, and lifts out the types in proper order, placing them in a little frame of metal which he holds in his one hand. This little frame is called the composing stick; one of its ends is moveable so that by means of a screw it may be fixed at a distance from the other, equal to the breadth of the page. When one line of types has been put into the stick, the compositor continues the process of setting, until the stick will not conveniently hold more. These are now carefully slipped out and slided on to a long flat board with a ledge, and the same process is continued until one or more pages be completed. Any one seeing for the first time a compositor at his case, must be struck with astonishment at the rapidity with which the experienced workman lifts the types from their respective boxes and places them in the stick, while at the same time so few errors are committed. In order to prevent the compositor from turning the type the wrong way or to prevent the letter from being inverted, a notch or nick is cut on the same side of each sort of types, which guides him to place it right.

When a whole page has been composed, or *set*, as it is technically called, the workman binds the types together by tying a cord round them. This is done while the types are on the ledged board formerly spoken of, and which is usually called a Galley. In some cases, it becomes necessary that the author should see an impression or *proof* of several pages before they are tied up, in order that if any thing is to be added or subtracted, the compositor may be saved the trouble of untying and retying the pages, but when the necessary corrections have been made, the types are tied in pages, as formerly mentioned. A sufficient number of pages having been composed in order to print one side of a sheet, an impression from them is taken and submitted first to the inspection of a corrector, who, by minute examination and comparison with the copy, endeavours to detect and point out by marginal references, all the errors that the compositor may have committed. This is called the first reading of the proof; and when the compositor has gone over his page, and made the necessary alterations, a second impression is taken, called the *revise*, which is also inspected by the corrector. According to circumstances, two or more revises are made; and when the corrector is satisfied, the last revise is sent to the author, to receive his corrections, which being attended to by the compositor, and examined by the corrector, the compositor's work is deemed fit for press. See *Correction of the Press.*

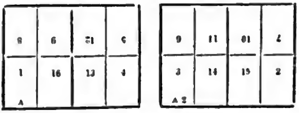
The pages of a sheet or half sheet, after having been composed and tied up, are transferred to a large table, the upper surface of which consists of a large flat stone of marble, Purbeck, York, or any other hard stone, six or eight inches thick, four feet and a half long, and about half as broad. This table is furnished with drawers containing wedges, pieces of wood, lead, &c., (called furniture), the use of which we shall presently describe.

The compositor having laid down the pages of one side of the sheet on the stone table in proper order, proceeds next to fix them firmly in a rectangular frame of iron, called a *chase*, and the process of fixing the pages is called 'dressing the chase.' The chase being placed so as to begird the form, the next object is to keep the pages at a proper distance from each other, in order that a regular margin may be obtained. The pages are kept at the proper distances from each other by means of rectangular pieces of metal, called *gutters* or *gutter-sticks*, placed between them; and another species of furniture, called *reglets*, is placed in the crosses of the chase, so as to give the work to be printed a proper margin after it is bound. The interior portion of the form being now finished, the outer edges are next adjusted, by placing side sticks and foot sticks to them, and the whole is firmly secured within the chase, after being properly adjusted by driving in wooden wedges, called *quoins*. This last process is called locking up, but before it is done, care is taken that all the types shall have their faces of one height, which is ensured by placing over them a flat piece of wood, and striking it with a wooden mallet.

The compositor must arrange the pages and fix them in the chase, in such order that when the impression is taken off, and the sheet folded, the pages will follow each other in proper order. There being two sides in a sheet, and eight or perhaps sixty-four pages on each side, some consideration is required to lay down the pages properly. On examining a printed sheet, uncut, containing sixteen or thirty-six pages, this will appear at first sight a very intricate matter, and it must be owned that where the pages are numerous in a sheet, the arrangement of the pages, (called imposing) requires, even from the most experienced compositors, care and consideration. The process of imposing is, however, based upon a simple law, which, if applied, cannot fail to guard against mistakes in the arrangement of the pages. In a work like the present, it would be completely out of place to enter into very minute details respecting this or any other branch of the process, but in order that the reader may see that there is a regular system or law observed in laying down the pages, we will subjoin plans of the pages of a sheet of 8vo. 12mo. and 18mo. that is, of sheets consisting of sixteen, twenty-four, and thirty-two pages. It must be premised, however, that the sheet being printed on both sides, that side which contains the first page of the sheet is called the outer form, and the other is called the inner form.

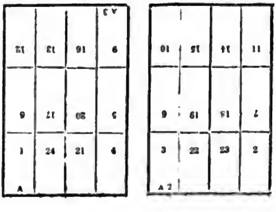
A Sheet of Common Octavo.

Outer Form. *Inner Form.*



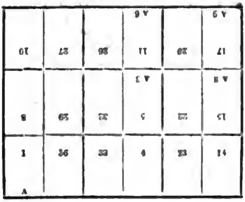
A Sheet of Twelves.

Outer Form. *Inner Form.*

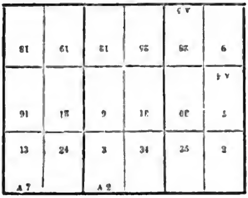


A Sheet of Eighteens, with One Signature.

Outer Form.



Inner Form.



A little attention to the foregoing examples will show that the order followed in the first is only extended in the more complex forms. It will be remarked that the pages go two by two, and that the numbers of these pages, when added together, always make one more than the number of the pages contained in the sheet. There being many sheets in some works, it would become a matter of great embarrassment for the person who folds them to be calculating the number of the page that should be the first in order while placing them together; in order to obviate which, letters (called signatures) are placed at the bottom of the leading page of each sheet, A for the 1st; B for the 2d; C for the 3d, and so on through the whole alphabet, and, if that be exhausted, a second alphabet is commenced. Thus, by merely looking at the signature, the collator sees at once the proper place which the sheet should occupy in the book.

As specified in the history of the art, printing was first performed by taking impressions from solid blocks, printing from moveable types being a later invention, and decidedly a vast improvement. In more modern times, a kind of junction of the two has proved of the greatest advantage, especially to some classes of publications. We refer to the invention of *stereotype* printing. Of this branch of the art, it will only be necessary for us to give a brief outline here, as a detailed account will be found under our article *Stereotype Printing*.

When the compositor has set up a page and tied it, as formerly described, it is fixed into a small chase or iron frame, after having been duly examined and corrected. A mould of gypsum or Paris plaster is taken of the page, and a casting of the whole page is taken in type metal, the cast being one solid plate. The plates necessary to complete a form are locked in a chase, in a way similar to the moveable type pages and sent to press, the after process with both being the same.

Before we dismiss the consideration of the duty of the compositor, we must advert to a part of his business which follows that of the pressman. When the pressman has printed off all the impressions that are to be taken from a form of moveable type, the chase is carried back to the composing room, and the compositor undoes the work that was formerly done, by distributing all the types, or putting them into their respective cells in the case. As much accuracy is required in the operation of distributing, as in that of composing, for if a type be put into a wrong box, an error must necessarily be committed in composing again from the same case. Any confusion that may exist in the assemblage of types, arising from accident or carelessness, causes great trouble, and the types, thus disarranged, are called *Pye*. The re-arranging of such types is performed by the junior apprentices of the printing office, and the operation is denominated *Picking pye*.

A compositor ought to be intimately conversant with orthography, especially in distribution, as errors committed in spelling will throw the whole case into pye. The compositor should also be well versed in the rules of punctuation, as this is very commonly omitted by the author in his manuscript, or sometimes only partially attended to. Many persons would be apt to imagine, that compositors must necessarily be possessed of a great deal of information, from their attentive perusal of works going through their hands, on every variety of subject. The writer of this article has had numerous opportunities, of comparing the intelligence of compositors with that of workmen engaged in other branches of industry, and from observation, he has no hesitation in saying, that compositors are above average, yet this arises not so much from their perusal of works, while engaged in setting or composing, as from private reading; for while engaged at the case, their attention is so much taken up with the mechanical part of the process, that the train of thought of the author can be little attended to; so that a historical work may be set up from beginning to end by a compositor, who at the termination could not show much intimacy regarding the subject of which it treated.

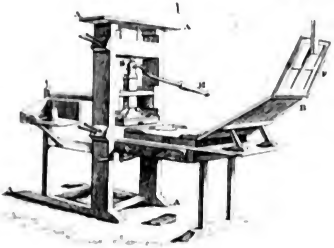
As before observed, when the form has been dressed and finished by the compositor, it is sent to the pressman, who fixes the chase in his press and adjusts it, so that an uniform and distinct impression may be taken off.

The paper to be printed is damped with clean water before it is subjected to the action of the press, in order that it may be softened, and thus accommodate itself to the surface of the types. A few sheets are dipped in a trough of water and laid upon a board, a few dry sheets are laid over these, and then a few wet ones, and so on, until the whole are piled up in a heap. They are then put into a common screw press, in order that the water may be pressed uniformly through them. The degree of damping will depend on the nature of the paper, and other circumstances, which experience alone can regulate.

The original inventor of the printing-press is not known, but it is certain that it received much improvement from William Janson Blaew, an instrument maker, and assistant to the illustrious astronomer, Tycho Brache, who brought it to a state of perfection, which was not surpassed till within these last sixty years. The construction of the old wooden press, or common press, as it is usually called, is very simple. A perspective view of it is given in Fig. 1. plate LXXVI. This press consists of two upright cheeks of wood connected together with strong cross pieces. This frame or body of the press is denoted by the letters A A A A in the engraving. The cross bar at the top is merely for the purpose of keeping the cheeks at a proper dis-

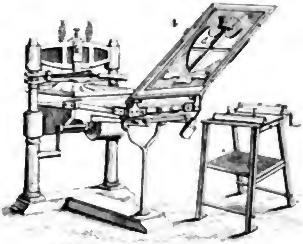
PRINTING.

1



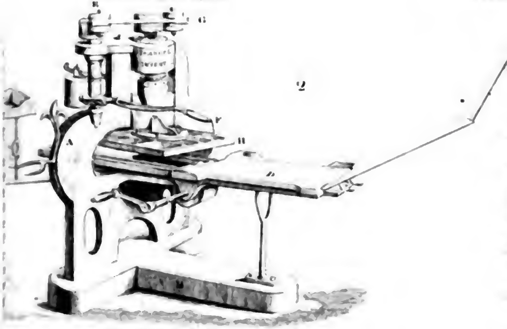
OLD WOODEN PRESS

4



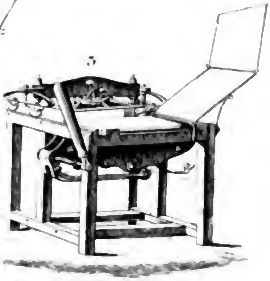
COGGERS' PRESS

2



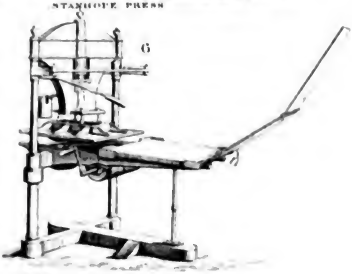
STANHOPE PRESS

3



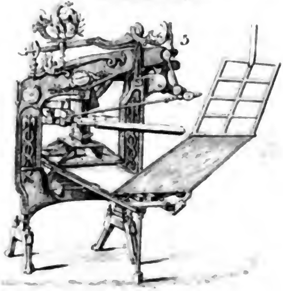
RUTHVEN PRESS

6



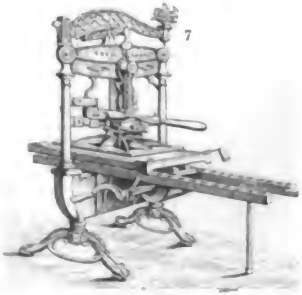
HOPE'S OR JEDBURGH PRESS

5



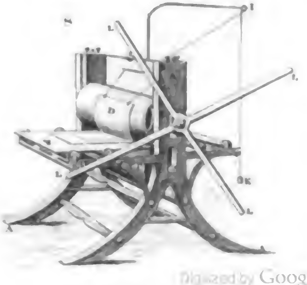
COLUMBIAN PRESS

7



COPE'S PRESS

8



COPPERPLATE PRESS

tance, and is called the *cap* of the press. The cross bar immediately beneath is firmly screwed into the cheeks by mortices, and contains a nut or female screw into which the top of the spindle or upright screw D works. This spindle may be turned round by means of the handle or bar E, and thus rise or fall and carry with it the *plattin* or flat base which presses the paper on the form of types. At a little distance below the plattin, there is firmly fixed in the cheeks the cross piece G, called the *winter*, and which supports the carriage H, on which the form of types is laid. The carriage may be moved outwards or inwards, on a rail being drawn out, when the paper is to be laid on the form, and moved in when the paper is to be pressed upon the types, by bringing down the plattin. The carriage is moved out or in by turning a handle below called the *spit*, the motion being communicated through the medium of a wheel and belts. The carriage contains on its upper surface a polished stone or flat piece of iron, called the *table*, on which the form of types is sustained. At the outer end of the carriage, there is attached an apparatus I K, called the *tympan* and *frisket*, the use of which is to fix the paper that it may be brought properly down upon the types. The *gallows* sustains two parts, i. e. two tympans I, and a frisket K. The tympans are two rectangular thin frames of wood or iron clasped together, and holding a sheet of vellum stretched. The tympans must be large enough to receive the sheet to be printed, which is placed upon it, and fixed upon small projecting points in the sides. The frisket is a rectangular frame jointed to the tympans so as to fold down and inclose the paper. When the paper is adjusted, the frisket is brought down on the tympan, and that closed down upon the types on the carriage; which having been previously inked, the carriage is run in, and the plattin brought down by turning the handle or bar, and thus the impression is obtained.

The chief ingredients in printers' ink are boiled linseed oil, and some colouring matter, such as lamp black, vermillion, &c. Good ink is absolutely essential to good printing, and no small portion of the beauty of the works printed by our best typographers is attributable to the excellence and durability of the colour of the ink they employed. In the works printed by the Messrs Foulis of Glasgow, the beauty of the ink still remains unimpaired, though their works have been published seventy years since; whereas, in some of the works printed in more recent times, five years are found to make a sensible change in the colour. We do not mean to assert, that the printing ink now generally used is inferior to that in common use formerly; but we have no hesitation in saying, that, now as formerly, inks of very different qualities have been made and used.

In former times, the ink was put upon the types by means of two stuffed leather balls, on which some ink was spread, a process which is now abandoned from its extreme tediousness, excepting in the case of very fine work, such as very superior wood cuts, in printing from which a much clearer impression is thus obtained than by inking on the more expeditious plan which we are now about to describe.

Instead of the inking balls, an elastic roller is now in general use. This roller derives its elasticity from a covering of a composition of treacle and glue. The ink is spread upon an iron table, from which a part is taken on to the roller, and spread on the form of types every time the carriage is drawn out. As division of labour expedites almost every process of art, so in this it is found advantageous to have two workmen engaged at the same time at one press, the one distributing the ink on the types, while the other is engaged in pulling the impressions.

From the very nature of the mechanical action of the press, Fig. 1, which we have described, it will be seen that great force must be exerted by the workmen, before much pressure can be given by the plattin, and accordingly the working of this press is as laborious an occupation as can be found in any other department of the arts of industry. Of late years, numerous attempts have been made to construct presses adequate to produce a sufficient pressure, and at the same time require less exertion on the part of the pressman. It is a well known law in mechanics, that whatever is gained in power must be lost in velocity; now in the action of the screw press above described, it is manifest that an uniform motion of the bar or handle of the screw will produce an uniform motion of the plattin, the same exertion being thus made by the workman from the beginning to the end of the pull, whereas the greatest exertion is only required at the end, when the plattin comes down upon the tympan. The most successful attempt to improve upon the principle of the old press was made by Mr Roworth, a printer in London. Instead of the screw at the top of the upright spindle, he had a projecting bar, which was acted upon by a circular inclined plane fixed in the head of the press, and so formed that when the spindle was turned round by the handle, the inclination of the plane forced the projecting piece at the top downwards, and consequently the plattin; but the peculiarity consisted in this, that the inclined plane has a greater degree of inclination at the top than at the bottom, and thus the speed of the descent at first will be much greater than at the last, and the power being inversely as the speed, it is exerted most where it is most required.

The advantages of this varied speed of the plattin are much more conspicuous in the press of earl Stanhope, represented in Fig. 2., in which A represents the stapple or body of the press, B the stand or bottom piece, called from its form the T. Immediately above this is the stand or forestay, consisting of two parallel rails or grooved ribs, on which the carriage or table D slides in or out from the plattin. H G is a stout lever head fixed into the top of the spindle or screw. E is another strong lever head fixed in an upright arbor, to the lower end; of which the handle F is attached. These two lever heads are connected together by a coupling bar or strong rod; thus any motion given to the lever head E produces a corresponding motion in the head G, and thence to the plattin; and the levers are so arranged as to produce the slowest velocity and greatest power at the end of the pull: when the pull has been made, the plattin is raised from the form by the action of a counter weight. The Stanhope press will print a form twice as large as the screw press, with greater ease to the workman. The first press on this construction ever used was completed in the year 1800.

In the year 1813, the ingenious Mr Ruthven of Edinburgh extended the principle of leverage introduced into the Stanhope press, by forming a printing-press in which the action of levers was alone employed, without the intervention of the screw; but the chief merit of his press is its great portability. Ruthven's press is represented in Fig. 3. The first peculiarity which must be noticed in this press is, that the table on which the types are placed is stationary, being fixed on the top of the frame of the press, and the plattin above it is moveable on or off upon rails, in a manner similar to the carriage in the presses formerly described;

the tympan and frisket, as will be seen in the figure, are attached to the frame. When the plattin is drawn over the tympan, it comes into checks or catches attached to side levers, which are linked very ingeniously to the long lever, seen under the table, one end of which is affixed to a crank at the side, wrought by a winch or handle. These attachments are made in such a way, that, by turning the winch, motion is communicated through the levers and links to the plattin, which is brought down; and in this, as in the Stanhope, the motion is at first rapid in the plattin, but slow when it comes upon the tympan, so that the greatest mechanical effect is produced. Mr Ruthven's press is now chiefly used for what is called jobbing, or for impressions where the form is small.

In Fig. 4. we have given a perspective representation of Cogger's printing press, which, according to Hansard, possesses considerable merit. Its superiority over the Stanhope consists in the less liability of the stapple to break, or that part in the Stanhope press which corresponds to the cheeks, head, and winter in the common screw press. The cheeks are pillars of malleable iron. On these pillars cast iron tubes are dropped, which support the winter; above these there are placed brass tubes, which give a resting place to the levers that effect the pressure. Above these the head is placed, all being secured by screws which are seen at the top. The plattin is made to descend by the action of levers turning a bar round in a collar, on the top of which there are two convex steel studs, acted on by inclined planes of varying inclinations, in order to cause the motion during the descent of the plattin to be at first rapid, and very slow at the termination, where the greatest power is required. The most important advantage of this press is, that it can in no way affect the distance of the plattin from the tympan by over application of power, and uniformity of impression is the consequent result.

In 1814, Mr G. Clymer of Philadelphia invented a printing press, which has obtained great celebrity. It was introduced into England in 1818, and is commonly denominated the *Columbian Press*. In this press, as in the Ruthven, the power is obtained solely by a system of levers, without the intervention either of screws or inclined planes. By this press a workman can pull a heavy form with much greater ease than with any of the presses heretofore described. Much mechanical ingenuity has been displayed in the arrangement of its several working parts, and no printing press has received so much aid in the improvement of its external appearance. A representation of the Columbian press is given in Fig. 5. The cheeks are connected at the bottom, but not at the top. The top of the cheek in the right hand side of the figure, serves as a fulcrum for one end of a large lever which is seen inclining downwards to the left. The left end of this lever is attached to a link, working in an arbor in the cheek, the lower end of which link is attached to another cross link, which again is wrought by the handle or bar, seen projecting towards the bottom of the frisket. The principal lever at the top is one of the second kind, its point of action being in the middle, where it presses down the stapple of the plattin, which stapple is a square rod of iron descending through guides so as to maintain the parallelism of the plattin. In order to raise the plattin when the pull has been made, a weight is placed on the top of the main lever between the point of action in the centre and the fulcrum to the right. In consequence of the strain arising from the oblique action of the levers, it sometimes happens that the cheek on the left hand side of the figure breaks, a circumstance which can only be attributed to a miscalculation of the strength of materials on the part of the press maker.

A very ingenious and effective press was invented by Mr Hope of Jedburgh, in Scotland, which may be regarded rather as an improvement upon the press of earl Stanhope, than in the light of an entirely new invention. The principal object aimed at in the construction of this press, is to bring the system of levers twice into action, instead of once, as in the presses heretofore described. This is effected by an additional forked lever attached to the off side of the iron standard, and another connecting rod leading round by the back of the press to the inclined planes or sectors. Herein lies the chief distinction between the Jedburgh press and the press of Cogger; the inclined planes of the former being made of cast iron, and those of the latter of steel or case hardened iron. Mr Hope has recently made some modifications in his press, by which the inclined planes are dispensed with, and levers alone employed, the principal advantage of which is, that the new presses are much more durable, and more easily repaired when they go wrong. Hope's press is represented in Fig. 6. plate LXXVI.

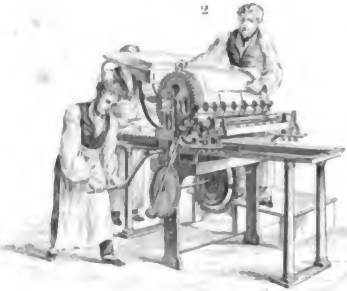
In Fig. 1. plate LXXVII. we have given a perspective view of a press, the merit of inventing which is claimed both by Mr Hope of Jedburgh and by Mr Stafford of Bingham in Nottinghamshire. This press resembles somewhat the press of Ruthven. The table is stationary in this as in the Ruthven press. The tympan and plattin are attached to each other, and they must be raised and turned down every time an impression is taken. When turned down, the pressure is obtained by the action of a screw and two levers, very ingeniously combined; but from the great weight of the plattin, it is impossible that this press can ever come into use where forms are to be printed larger than foolscap. Indeed, so far as utility is concerned this press is inferior to the press of Ruthven, even for impressions from small forms.

Fig. 7. plate LXXVI., is a view of the Albion press of Mr R. W. Cope, which exhibits some novelties in mechanism, and has been found superior to most presses, especially for moderate sized forms. The pull is not heavy, and from the excellent mechanical arrangement of the working parts, the strain is so distributed as not to act very materially on any point, and hence the press of Mr Cope is less liable than any other press of equal power, to give way. The pressure is given by a combination of levers acted on by the bar handle, which in this press is better situated than in the Columbian, being attached to the near cheek, and consequently more within the reach of the pressman. Another great advantage connected with the bar handle is, that the pull requires only about one quarter of a turn, and consequently the impression is more speedily taken by this press, than by the Columbian, and the bar handle returns only so far as to clear the rise of the tympan. The pressure is given by means of two limbs forming a knee joint, and the action of the levers brings this knee joint into a perpendicular position, the under link pressing down the stapple which carries the plattin. The stapple moves up and down in a hollow cylinder. This is the first instance in which such a contrivance has been introduced into the mechanism of a printing press. The parts are so few and so judiciously arranged, that there is little friction, or liability to wear or go wrong. An improved modification of this press was made the subject of a patent by Messrs Sherwin and Cope. It is denominated the Imperial press, and is much esteemed among printers.

PRINTING.

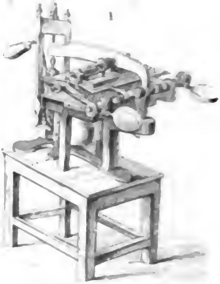
PLATE.

2



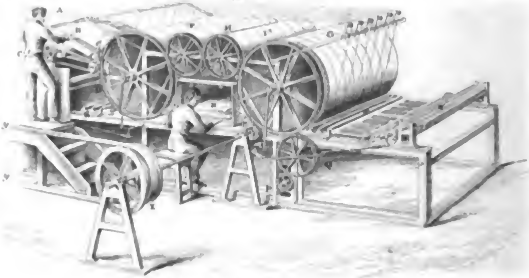
RUTTS MACHINE

1



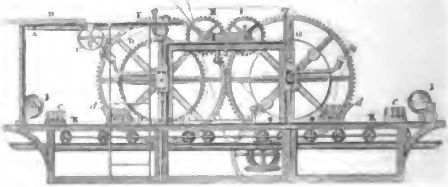
STAFFORD'S PORTABLE PRESS

3



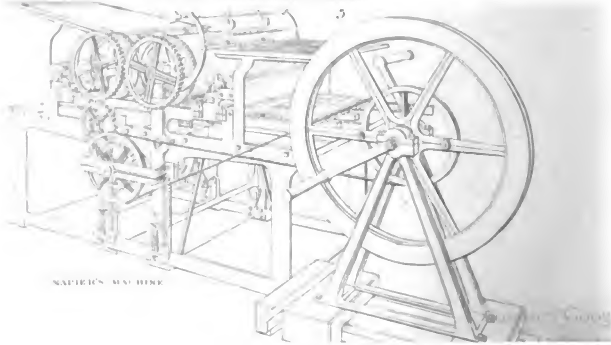
BENSLEYS MACHINE

4



SECTION OF APPLEGARTH'S MACHINE

5



NAPIER'S MACHINE

Many other ingenious forms of the printing press have been invented, among which may be more especially mentioned the very celebrated printing press of Mr Tredwell of North America. This press was patented in England, by the inventor, in 1820, but has never come into general use here, although it is very common and highly approved of by the printers of the United States. This press acts by levers, but they are so disposed that the power is applied by the foot of the workman to a treadle, leaving both of his hands free. In this press, as in that of Mr Ruthven, the table is fixed, but the frisket is made double, so that both sides of the sheet may be printed without shifting, which is a great advantage in half sheet work. The contrivance of this press does great credit to the originality and mechanical ingenuity of its inventor. The great objection to its use in this country seems to be, that it occupies a very great deal of room in the printing office.

The great labour required to work the hand press even in its most improved form, as also the slowness of the process, rendered it desirable that some more expeditious and easy method of taking impressions from types should be obtained; and we are now about to draw the reader's attention to the progress and present state of the attempts that have been made to supersede the hand press, by the application of machinery.

So early as the year 1790, Mr Nicholson, editor of the well known journal that goes by his name, took out letters patent for printing by machinery. His plan consisted in forming the types with a tapering body or stalk, in order that they might be placed on the surface of a cylinder, and kept compact like the voicoirs of an arch. These types being placed on the surface of a cylinder, he distributed the ink by means of stuffed rollers or brushes. His printing machine never became available in practice, yet he deserves the credit of being the first who suggested the application of cylinders and inking rollers. About ten years subsequent to this period, one Konig, a printer in Saxony, turned his attention to the improvement of the printing press, with a view chiefly to accelerate its operation. By numerous experimental trials, and with the assistance of another German, named Bauer, he at last produced a machine for printing, which, with modifications and improvements, stands, both with respect to ingenuity of mechanism and importance of application, in the first rank of the monuments of human intelligence. Being unsuccessful in all his applications to the printers and capitalists of his native country, for assistance to bring his scheme into operation, he came to London in 1804. There he was, for a considerable time, received with equal coldness, until he met with Mr Bensley, who had the sagacity to perceive and the boldness to adapt the views of the ingenious Saxon. Mr Bensley and his copartner Mr Taylor (a printing company in which the celebrated Woodfall had till a short time previous held a share) made numerous attempts to bring the machine into operation, and ultimately succeeded in completing a model, the action of which so satisfied Mr Walters, proprietor of the *Times* newspaper, that an agreement was entered into to erect two machines to print that journal. These machines were accordingly erected; but so secret was the matter kept, that the public knew nothing concerning it until, on the 28th of November, 1814, the reader of the *Times* was informed, that he held in his hand a paper printed by machinery, moved by the power of steam. This is commonly supposed to be the first specimen of printing executed by steam machinery, but a machine was set to work in April, 1811, and 3000 sheets of signature H of the Annual Register for 1810 were printed by it. This was undoubtedly the first work printed by machinery. The machine we are now speaking of was only capable of printing the sheet on one side, and the distribution of ink was unequal, the inking rollers being covered with leather instead of the composition of glue and treacle, formerly alluded to. These imperfections were repaired, and improved machines were offered for sale by Messrs Bensley and Co. in 1817. This machine performed its work very well, and although it has given place to machines of a more simple construction, in the minute detail, yet the leading principles are followed in the construction of the machines of modern date.

In Fig. 3. plate LXXVII. we have given a view of what is called Bensley's machine. It is moved by a steam engine, the power being communicated by a belt *y y*, passing round the pulley X. The machine requires the attendance of two boys, one to deliver the sheets to be printed and the other to receive them after the impression. The principal parts are shown in the figure, but on account of the smallness of the drawing some of the minute details are omitted. The sheets of blank paper are laid upon the table A, and from thence taken by the boy at the end of the machine, and placed upon the table B. This table has a number of linen tapes passing over its surface, so as to lead the sheet laid on them into the machine. These tapes are in fact an endless web, similar in principle to that described in our article *Cotton Manufacture*, as belonging to the spreading machine. These tapes are kept continually moving in one direction by the revolution of the rollers C and D. By the motion of this system of tapes the blank sheet is led forward, and delivered over the roller E, to be seized by two systems of endless tapes, which are kept tight by being passed over a series of rollers. These endless tapes are adjusted so as to lie upon the sheet on those parts only that are not to be acted on by the types, or in other words, the tapes touch only the margins and the divisions of the pages, in order that they may hold the paper during the whole of its progress through the machine. The use of these two systems of tapes is to keep the sheet in its proper position during the process, and thus to insure an accurate register, or the exact placing back to back of the pages on both sides of the sheet. The most prominent parts of the machine are two large cylinders F and G, and two intermediate smaller cylinders H and I, round which the systems of tapes which we have spoken of above pass, and carry with them the sheets of paper to be printed. These four cylinders revolve upon axes supported by the frame work of the machine. The use of the intermediate cylinders H and I is to effect the turning of the sheet, so that after an impression has been given on one side by the main cylinder F, the other side may receive an impression by passing round the main cylinder G. The whole contrivance is at once simple and ingenious, and deserves the reader's attention.

One of the systems of tapes passes round the upper surface of the roller E, and the sheet passing over them is carried round the under surface of the main cylinder F, the tapes keeping the sheet tight upon the cylinder. When the sheet arrives to the bottom of the cylinder, it comes into contact with the form of types lying upon the carriage, which is seen placed horizontally below, and which will be more particularly spoken of hereafter. The sheet having thus received an impression, is carried by the system of tapes revolving with the cylinder F up, wards, and over the intermediate cylinder H, then under the intermediate cylinder I, and over a considerable portion of the upper part of the main cylinder G. This system of tapes now leaves the main cylinder G, and being made to pass over a set of rollers, returns back in order to pass again over the receiving roller E. The other system of tapes takes the same course so far as we have described, the two systems holding the sheet between them until it has received the impression from the form under the second main cylinder G. The two systems then pass from off the cylinder over a roller at the left hand side of the boy who is represented as sitting behind the driving pully X, at the centre of the machine. Here the two systems separate, the one being passed under a series of rollers under the machine and the other being led by a series of rollers above it, the two systems returning by different routs, where they again unite and grasp the sheet to carry it through as already described. The reason why the two systems of tapes are made to separate is, that the sheet which has been carried over the two main cylinders F and G may be delivered upon a table in the centre of the machine, where a boy is represented as sitting to receive them. The mechanical reader will easily perceive, that since the two main cylinders are of greater diameter than the two intermediates, the latter must make a proportionally greater number of revolutions in a given time than the former, to ensure the uniform velocity of the two systems of tapes throughout the process, and thus prevent their sliding and the consequent derangement of the register. The uniform velocity of the surfaces of the main and intermediate cylinders, is obtained by connecting them together by a series of wheels, with appropriate numbers of teeth, the principal of which wheels are represented in the engraving.

Having now considered the simple yet ingenious manner in which the two systems of tapes are adjusted, in order to procure an accurate register, a point of the highest importance, we will next draw the reader's attention to the carriage, before alluded to, on which the two forms of types are laid.

The carriage corresponds in office to the plattin of the common hand press, being the bed or table upon which the forms of type are laid. The operation of the machine requires that it should have an alternating horizontal motion, which is obtained by mounting it upon casters or wheels that move upon two rails or guides firmly fixed to the frame of the machine. This reciprocating motion of the carriage is performed by a pinion turning in an endless rack below, the teeth of the pinion acting on the teeth of the upper part of the rack to drive it forward, and again on the teeth of the under part to cause it to return. This part of the apparatus is too minute to be represented in the engraving, but this is of the less consequence, as it is a contrivance well-known to every mechanic, as being one of the simplest and most effective methods of converting a continuous circular motion into a rectilinear alternating one. This rack derives its motion from the wheels Q and P, driven by the main cylinder G, the motion thence being conveyed to an upright spindle by the intervention of bevelled wheels. The rack apparatus is connected to the carriage by a simple arrangement of levers. The carriage thus moving alternately backwards and forwards, carries the two forms of types, (which are securely fixed upon it at a proper distance,) alternately under the main cylinders F and G, to give the impression. The adjustment of the two forms upon the carriage must be properly made, otherwise the register will be destroyed.

By no means the least important or least ingenious department of the printing machine, is the apparatus for furnishing and distributing the ink.

This is mainly if not entirely the invention of Mr Cowper. It is performed by means of rollers covered with an elastic composition of treacle and glue, formerly alluded to, and to which he thus refers in a lecture delivered by him on the recent improvements in printing, delivered at the Royal Institution in February, 1828. "The hand inking roller, and distributing table, now so common in every printing office in Europe and America, is my invention, and is included in my patent. The decided superiority of the inking apparatus in our machine over the balls used in the press, induced us immediately to apply it to the common press, and with complete success. The invention, however, was immediately infringed throughout the kingdom; and it would have been as fruitless to have attempted to stop the infringement of the patent, as it was found in the case of the Kaleidoscope." This is one instance among the thousands that might be adduced, to show the deficiency of our *patent laws;* for, independently of the original cost of taking out a patent, the expence of defence is so great, that when the cases of infringement are numerous, the cost is beyond the capital of the most wealthy manufacturing company in the kingdom.

The maintenance of accurate register is, as has been already observed, a most important object to be attained in the process of printing, and we have considered the very simple and ingenious contrivances by which this object is accomplished. A point not less important in the art of printing is, the uniform and proper distribution of the ink upon the types. The machine we are now describing has two forms of types, each of which requires a distinct inking apparatus; there are therefore two sets of the inking department, entirely similar to each other, one situated at each end of the machine. The inking rollers are seen at S, in Fig. 3. plate LXXVII. But the action of the whole apparatus will be more clearly understood by a reference to the side elevation of an improved form of the machine, shown in Fig. 4.

The ink is contained in a box, *b*, at the end of the machine, in which box there revolves an iron cylinder, polished, and stretching across the whole breadth. In the same box there is an iron plate, whose edge is ground accurately so as to be parallel to the surface of the iron roller, which plate is capable of being so adjusted, by means of a screw, that its edge may be brought to any required point of nearness to the iron roller. The ink lies upon the plate, which is placed in an inclined position, in order that it may fall down upon the iron roller; but the edge of the plate is brought so near to the roller, that only a small portion of the ink can pass between the edge of the plate and the roller. This secures uniformity in the delivery of the ink. This part of the apparatus is seen at N, in Fig. 3. Immediately below these, there is a composition roller, moved by an eccentric on the axis of the main cylinder, the connection being made by a side lever, as may be seen in Fig. 3. at *n*. By means of this eccentric motion, the roller we are now speaking of revolves upon a crank, in such a way that it rises and comes into contact with the iron cylinder in the box *b*, and remains in contact while the carriage is moving from it; but whenever the carriage begins to return, this eccentric roller falls and presses upon the iron table T at the end of the carriage. The ink received from the iron cylinder or roller is thus transferred to the table of the carriage; but in order to accomplish an equal distribution upon the table, there are three composition rollers, *c*, so situated as to press upon the table when it comes under them. The axes of these rollers rest in a part of the frame-work, and act by their weight upon the table; and in order still farther to insure an equable distribution of the ink, the axes of these rollers are capable of a slight motion sideways, which motion is of a sort of zig-zag description, and given by the form of the sides of the table which guide the rollers. The ink being thus spread upon the table, must next be distributed upon the form of types. To distribute the ink that has been spread upon the table, over the types, there is another system of three or four rollers, *d*, also fixed on axes supported by the frame. These rollers are like the spreading rollers, capable of a motion up and down, their axes resting in guides fixed in the frame-work, but they are not, like the spreading rollers, capable of any sideward motion. These distributing rollers act like the spreading ones, by their weight, first in receiving the ink from the table, and then in distributing it upon the form of types. It has already been observed that there are two sets of inking apparatus, one at each end of the machine, entirely similar to each other; and from the description of the machine we have given above, it will be readily perceived, that while the operation of inking the types is going on at one end of the machine, the impression is taking place at the other, and that while the carriage is moving towards the inking rollers, the eccentric roller is down to deliver the ink from the metallic roller to the table; but when the carriage is returning the eccentric roller rises to receive ink from the metallic roller. Simple though the inking department seems to be, it was nevertheless one of the most difficult to accomplish.

Fig. 4. is an improved form of Cowper and Applegarth's machine, the general principles being the same as those of the machine shown in Fig. 3. The same letters of reference are used as in Fig. 3. and we will now take a general view of the process of printing a sheet, in order that the details given above may be more closely connected together. The sheets of blank paper are laid one by one on the table B by one boy, and are carried by the web of linen tapes passing over its surface to the roller E. The tapes in this table move upon rollers which have an alternating motion, so that when a sheet has been advanced to the roller E, the tapes return to their original position to receive another sheet. The motion of this set of tapes is so managed, that the sheet just arrives at the junction of the two systems of tapes at E, when that part of the main cylinder F, which is furnished with a blanket (to give elasticity to the pressure) has arrived at the roller E. The sheet is thus grasped by the two systems of tapes, and held upon the surface of the blanket on the main cylinder F, which revolving, presses it upon the inked form of types beneath. By the reciprocating motion of the carriage the other form of types, belonging to the cylinder G, is receiving ink, while the paper on the cylinder F is getting the impression. The sheet is now carried round the two cylinders H and I along with the tapes, and delivered by them upon a blanket on the main cylinder G, where it will be found inverted, that is, with its printed side next to the cylinder. Here it receives the second impression, and, after leaving the form, the two systems of tapes separating, no longer grasp the sheet, which is consequently delivered upon a table in the centre of the machine. Here it is taken by a boy and placed upon a pile.

It is worthy of observation that not less than seventy printing machines were constructed by Messrs Cowper and Applegarth, all acting upon the general principles we have been describing; but with a view to simplification and accuracy the arrangement of these seventy machines was such that not one of them was identical in mechanical detail with another. It is the general tendency of mechanical invention to simplify, and a notable instance occurs in the history of this machine. No fewer than forty wheels were removed from the original machine of Konig, by Cowper and Applegarth.

Some notion of the execution of the printing machine may be formed from the following announcement in the *Times* of February 14, 1828. "It is now nearly fourteen years since '*The Times*' first issued from our office printed by steam and a mechanical apparatus. At that time we spoke as we thought with becoming praise of the perseverance and ingenuity of the inventor, Mr Konig, and with sufficient modesty, we trust, of our own firmness and resolution in overcoming opposing difficulties and even dangers. This surprising machine has since received certain improvements from the hand of its original inventor; but we have now to present to our readers and the public, an account of a vast and most beneficial change which has taken place. The first machine printed but 1100 sheets per hour,—the reader now holds in his hand an impression which a new machine has yielded at the rate of *four thousand an hour*. Such ease, rapidity, and accuracy united, could hardly ever before be ascribed to any fabric constructed by the hand of man. Let but the reader contemplate, if he can, what must be the rapidity of those motions which throw off four thousand printed sheets in every hour, or nearly seventy in a minute." The paper is now printed at the rate of 4200 impressions per hour, and in cases of great emergency at the rate of 5000 per hour. The original inventor of the printing machine had much difficulty in bringing it into operation, and even after having satisfied himself of the efficacy of his contrivance, he encountered the greatest difficulties in bringing it into use. Konig himself states that "Scarcely ever was there an invention brought to maturity under such circumstances. The well known fact, that almost every invention seeks as it were refuge in England, and is there brought to perfection, seems to indicate that the continent has yet to learn from her the best manner of encouraging the mechanical arts. I had my full share in the ordinary disappointments of continental projectors, and after having spent in Germany and Russia upwards of two years in fruitless applications, I proceeded to England." Dr Olinthus Gregory, when discussing this subject in a lecture delivered in 1826 to the Deptford mechanics' institution, remarks, "What could not be accomplished by the encouragement of princes on the continent, was effected by the aid of private individuals in London."

The great expedition secured by the printing machine, compared with the operation of the hand press, alarmed the journeymen printers, who considered its introduction highly injurious to the interests of the trade, as having a tendency to diminish the number of hands employed. They therefore gave it all the opposition in their power in London, as afterwards in Edinburgh and Dublin. Its introduction to Glasgow occurred at a later period, and the intelligence of the workmen had attained sufficient strength to convince them of the erroneousness of such an idea, and accordingly not the slightest opposition was made. To those who have given serious attention to the subject, and viewed it in all its bearings, it must be evident that whatever cheapens the cost of printed works, must increase the demand, and that in a far greater degree than the mere ratio of the diminution of price and a corresponding increase of the individuals employed in manufacturing and distributing. We hesitate not to say, that one of the greatest benefits conferred for the last hundred years on the operative printers, was the introduction of the *printing machine*.*

A printing machine, possessing very considerable advantages, has been invented several years since by Mr D. Napier of London. The general action of this machine, so far as pressing by cylinders and inking by rollers, is concerned, is identical with the machine of Cowper and Applegarth, but in this machine the moving power is not obtained from a steam engine, but from two men turning a winch, on the axle of which a heavy fly wheel is placed, to ensure regularity of motion. The manner of keeping register in this machine is novel, being performed by gripers within the cylinder, which perform the office of the tapes in the machine formerly described. The manner of engaging and disengaging these gripers is very ingenious, but too complicated to admit of a particular description here. By the introduction of this contrivance for keeping the register by gripers instead of tapes, and by another piece of mechanism, equally ingenious, of raising and depressing the pressing cylinders by means of eccentrics, the two intervening cylinders in the other machines is dispensed with, and hence much space and much power is saved. The degree of pressure too can be adjusted to any degree required. The inking apparatus has some peculiarities, which contribute greatly to the equal distribution of the ink on the types. Mr Hansard states that his machine turned off one thousand sheets printed on both sides per hour, but admits that the labour of driving was considerable. This machine, it may be necessary to remark, has never been brought into very general use.

With respect to Mr Rutt's machine, a perspective view of which is given in Fig. 2. plate LXXVII., we require to say very little, after the very minute account we have already given of Cowper and Applegarth's. Rutt's machine, like that of Napier, is driven by manual power, and the principle of a revolving cylinder is also employed. A table is seen at the back of the machine, with a boy in the act of taking away a sheet after it has been printed. During the time that the table returns to the front part of the machine, the cylinder remains stationary, allowing time for another boy to lay another sheet on it, as shown in the figure. When the table returns to the back part of the machine, the cylinder revolves, and the inking and printing are accomplished. The ink rollers are moved by bevelled wheels at the side of the machine, and, by a simple mode of disengagement, the inking apparatus may be wrought for trial and adjustment independently of the cylinder motion.

Messrs Bacon and Duncan also invented a printing machine, which possesses considerable merit. The types were fixed in galleys, on the four sides of a revolving prism. The ink was distributed over the types by an elastic roller at the top of the prism, and the pressure was given by another elastic roller at the bottom, which applied the paper to the types on the revolving prism; the motions were all connected by a train of wheel work.

Mr William Church of Birmingham took out letters patent in the year 1822, for printing machinery, very ingeniously contrived, but never brought into general use. His patent embraced three machines.

The object of the first is to cast metallic types with extraordinary expedition, and to arrange them for the compositor.

The second machine selects and combines the words into sentences.

The third is for taking impressions from the types so arranged.

Professor Babbage, who was noticed under our article Arithmetic, has invented a machine for calculating and printing mathematical tables, with unerring precision; but although a great deal of money has been advanced by government, for expediting its construction, and it has been many years in progress, no idea can be formed of the time of its completion.

Copper-plate Printing. It is supposed that impressions were taken from engraved copper-plates so far back as the year 1540, but the art was not introduced into England before the reign of James I. The presses employed, till a recent date, were constructed of wood; and though sufficiently simple in construction and fitted to take off impressions, they were nevertheless, from the nature of the material, clumsy and not durable. The presses are now universally constructed of iron. All engraver's presses are of the rolling kind and act upon the same general principles, but differ in minute details. The most improved form of the engraver's press is that of Mr Dyer. A perspective view of an improved form of press F. 8. plate LXXVI. A A A is the frame or stand of the press, made of cast iron, and consisting of two sides, connected together by cross pieces of malleable iron. C and D are two rollers of iron, accurately turned in the lathe, and turning on iron axes which pass through the side cheeks of the frame. The axis of the upper roller seen at *x* is turned by means of the four levers L L L L, and the pieces in which this axis turns are not permanently fixed in the frame, but are capable of being raised or depressed by means of screws. F is a plank of mahogany or other hard wood, having its upper surface fixed with a plate of iron; or it is formed entirely of iron. This piece of wood is about equal in breadth to the length of the rollers. It is upon this that the plate from which the impression is to be taken is laid. The plank and plate are placed so as to slide between the rollers when they are made to revolve by the turning of the handles L L L L. The use of the screws for raising or lowering the axes of the rollers, is that they may be adjusted at such a distance from each other, as to give the requisite degree of pressure on the plate as it passes between them. The upper roller has a blanket upon it, which is kept adapted to its surface by means of a string over a pulley I, and having a weight K suspended at the other end. After the carriage or plank F is passed between the rollers and an impression given, it is made to return, by being drawn back by a loaded string passing over a pully. The plate is first laid over with ink, and the superfluous portion being taken away by wiping, the paper, damped, is laid over it, and the whole being passed between the rollers, the impression is taken.

For a description of the lithographic printing press, see our article *Lithography*.

PRIOR, in monasteries; the next officer in rank to the abbot; or, where there is no abbot, the superior of the monastery.—*Prioress* is applied, in a similar sense, to the head of a female convent. A monastery which is under the government of a prior is called a *priory*. See *Abbot*, and *Monastery*.

PRIOR, Matthew; an English poet, born in 1664, in London, or at Winborne, in Dorsetshire. His father dying when he was young, he was brought up by an uncle, who kept the Rummer tavern at Charing-cross, and sent to Westminster school. He early imbibed a strong taste for classical literature, and attracted the notice of the earl of Dorset (see *Sackville*), who enabled him to enter himself, in 1682, at St John's college, Cambridge, where he proceeded B. A. in 1686, and was shortly after chosen fellow. At college he contracted an intimacy with Charles Montagu, afterwards earl of Halifax, in concert with whom, in 1688, he composed the Country Mouse and City Mouse,—a parody on Dryden's Hind and Panther. In 1690, he was introduced at court by the earl of Dorset, at whose recommendation he was appointed secretary to the English plenipotentiaries at the Hague. With this post he also held the title of gentleman of the king's bed-chamber; and he presented an ode to king William in 1695, on the death of queen Mary; and soon after displayed his humorous vein in a parody of Boileau's ode on the taking of Namur, when it was recaptured by William. In 1697, he was nominated secretary to the commissioners for the treaty of Ryswick; and, on his return from that employment, was made secretary to the lord-lieutenant of Ireland. He was afterwards secretary to the earls of Portland and Jersey, successively ambassadors to France. At length he was made under-secretary of state, and, while holding that office, was sent to France to assist in the partition treaty. In 1701, he succeeded Locke as a commissioner at the board of trade, but soon after deserted the whigs and joined the tories, for which no satisfactory reasons have been assigned. At the beginning of the reign of Anne, he published a volume of poems, and took some share in the Examiner. When the tories again obtained the ascendency, he was employed in secretly negotiating at Paris the terms of the treaty of Utrecht. He remained in France, with the appointment of ambassador, and, after the departure of the duke of Shrewsbury, in 1713, publicly assumed that character. On the accession of George I., he was recalled and examined before the privy council in respect to his share in negotiating the treaty of Utrecht, and treated with great rigour for some time, although ultimately discharged without trial. Being without any provision for his declining years, except his fellowship, he again applied himself to poetry; and having finished his Solomon, he published his poems by subscription. The publication, being liberally encouraged by party zeal, produced a considerable sum, which was doubled by the earl of Oxford, at whose seat the author died, after a lingering illness, in 1721, in the fifty-eighth year of his age. He was interred in Westminster abbey, under a monument, for which "last piece of human vanity," as he styles it in his will, he left the sum of £500. Prior seems to have made his way by wit and social qualities, rather than by moral or political endowments of a superior order. He is said to have always retained a taste for coarse intercourse and gross enjoyments. As a poet, his reputation has declined of late years, the humour in which he principally excels being overlooked on account of the character of his serious performances, which, although as in his Solomon, and Henry and Emma, splendid and correct in diction, harmonious in versification, and copious in poetical imagery, fail in moving either the feelings or the fancy. The great art of Prior consists in telling a story with a degree of poetical ease and vivacity, which, perhaps, setting aside La Fontaine, has never been excelled. His Alma, a piece of philosophical pleasantry, exhibits a felicitous vein of humour; and for his lighter pieces he is now chiefly read. A History of his Own Times, compiled from his MSS., contains little from his pen, and is of small value. His poems were published in 1733, in 3 vols., 8vo, and are also in all the collections.

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* What is commonly called Bensley's machine is Cowper and Applegarth's; the drawing was taken first from a machine bought by Mr Bensley.

PRISCIAN. See *Philology*.

PRISM, in geometry, is a body, or solid, whose two ends are any plane figures which are parallel, equal, and similar; and its sides, connecting those ends, are parallelograms. Hence every section parallel to the base is equal and similar to the base; and the prism may be considered as generated by the parallel motion of this plane figure. Prisms receive particular names, according to the figure of their bases; as a *triangular* prism, a *square* prism, a *pentagonal* prism, a *hexagonal* prism, and so on. And hence the denomination *prism* comprises also the cube and parallelopipedon, the former being a square prism, and the latter a rectangular one. And even a cylinder may be considered as a round prism, or one that has an infinite number of sides. Also a prism is said to be *regular*, or *irregular*, according as the figure of its end is a regular or an irregular polygon. The *axis of a prism* is the line conceived to be drawn lengthwise through the middle of it, connecting the centre of one end with that of the other end. Prisms, again, are either *right* or *oblique*. A right prism is that whose sides and its axis are perpendicular to its ends, like an upright tower; and an oblique prism is when the axis and sides are oblique to the ends; so that, when set upon one end, it inclines on one hand more than on the other. The principal properties of prisms are, 1. That all prisms are to one another in the ratio compounded of their bases and heights; 2. Similar prisms are to one another in the triplicate ratio of their like sides; 3. A prism is triple of a pyramid of equal base and height, and the solid content of a prism is found by multiplying the base by the perpendicular height; 4. The upright surface of a right prism is equal to a rectangle of the same height, and its breadth equal to the perimeter of the base or end, and therefore such upright surface of a right prism is found by multiplying the perimeter of the base by the perpendicular height. Also the upright surface of an oblique prism is found by computing those of all its parallelogram sides separately, and adding them together. And if to the upright surface be added the areas of the two ends, the sum will be the whole surface of the prism.

Prism, in optics, is an instrument employed for showing the properties of solar light, and consists merely of a triangular prism of glass, which separates the rays of light in their passage through it. See *Optics*.

PRISON DISCIPLINE. The true and only real object of punishment is the prevention of crime. There is, of course, a great latitude of choice in the means which may be adopted for the attainment of this object,—a latitude to be limited by a just regard to the rights inseparable from human nature, however depraved, by a correct view of the true power of society over its members, and by a wise estimate of the probable effect of the means employed. In most ages of the world men seem to have imagined their rightful power over their fellow men absolutely unlimited, and have inflicted punishment upon the violators of the law, apparently without regard to any other consideration than their own pleasure, and the degree of guilt they have attributed to the offender. Acting with this apprehension of their own unrestricted power, they have, at the same time, exhibited the most narrow acquaintance with the almost infinite variety of means of punishment. They have confined themselves very much to the effects of physical suffering, as if that were the sole remedy which could be advantageously applied to moral depravity; a depravity often increased, if not caused, by the temptations to which physical suffering has itself exposed men. It has happened, too, in this, as in so many other human pursuits, that the end has been forgotten in attention to the means; and the object has appeared to be rather secretly to harass and oppress the subjects of punishment, than either to deter others from the commission of crime, or to amend the habits of the guilty themselves. None would be prevented from the commission of crime by penalties which were unknown; and, in the extreme depression of every physical and mental quality, it were absurd to expect any reformation of the unfortunate subjects of human severity. In all ages and nations of which we have any record, from the most refined people of ancient times to the most civilized of a more modern era, have such extremes of severity been used in the punishment of criminals as justly to deserve the appellation of *cruelty*. Torture, in every horrible variety; chains; stripes; solitary confinement in darkness, dampness, and idleness; promiscuous crowding of offenders, of every degree of guilt, in the same loathsome, pestilential, narrow vaults; insufficient and unwholesome food; filth; illness of the body, and sickness of the soul,—are some of the evils which have, in every age, been wantonly, carelessly, or ignorantly inflicted upon the violators of law; and, what is worse, they have been inflicted upon those who have violated no law; upon many who have been proved innocent, after suffering the infliction of some or all of the ills enumerated in this atrocious catalogue, and upon many whose imprudence alone has exposed them to the vengeance of an equally imprudent creditor. Society has, unquestionably, a right to punish the offenders against its laws, and against those of God; but has it, under any circumstances, a right to inflict such suffering as we have named? Has it a right to trifle with or endanger the health, the intellect, or the remaining principles of any, even the worst, of its members? It requires no metaphysical examination of the reasons on which the just and necessary power of society is founded, to answer in the negative. All feel that the proper adaptation of the means to the just end of punishment ought to be constantly kept in view. A striking illustration of the truth of this remark may be found in the universal outcry of horror and indignation, which was heard throughout the civilized world, when Howard disclosed the misery everywhere suffered by the prisoner; in the guilty consciousness with which those who exercised control over prisons universally shrunk from the disclosure of the atrocities committed under their authority, or, at best, allowed by their negligence; and in the immediate formation of associations to promote the necessary reform in the construction and government of prisons. From the year 1777, when Howard's work on the state of the prisons in England and Wales was first published, may be dated the origin of the study of the best system of prison discipline. There were, indeed, previous noble examples of attention to those who were sick and in prison, but it then became a subject of general interest. The effect of Christianity in softening the character, and meliorating the condition of men, had been perceptible, even in the treatment of the culprit; and, from time to time, there had arisen in the world men distinguished for the kindness they exhibited to those to whom kindness was almost unknown. The names of Carlo Borromeo, Claudius Bernard, and St Vincent de Paul, ought never to be forgotten among those who have shown mercy to the captive. But Howard deserves still greater veneration for his persevering philanthropy and entire devotion to his noble object. The sphere of his exertions was not limited to his immediate neighbourhood, but extended first throughout his native land, afterwards to adjoining kingdoms, and embraced at length the whole of Europe.

Nothing more was necessary than to witness the state of abject misery existing in prisons, in order to perceive the necessary remedy, in many cases. Thus the evils arising from crowded and filthy rooms, and from want of circulation of air, could be prevented only by a better construction of the buildings; while those arising from the exaction of fees from the prisoner, and from the sale of liquors by the officers, could be remedied only by a new system of discipline. Many of the ideas, therefore, which have been since acted upon, in the construction and government of prisons, were suggested by Howard, while experience has produced some improvements in his plans. It cannot be said that any regular system of prison discipline was introduced by Howard; nor has it even yet been carried to the perfection which may reasonably be expected; but the progress already made affords the greatest encouragement. It would not be easy to trace this progress with exactness, assigning to each labourer in the cause his due share of merit; nor is it necessary; for there is no great difficulty in discovering the general remedies for the various evils of imprisonment. The essential requisites in a prison are obviously security of construction and healthiness of situation; and, in its management, classification, oversight, labour, and instruction. It is in the previous arrangements for securing these advantages, and in the practical application of these general principles, that the difficulties lie; and so numerous are these difficulties, that great diversities of feeling and opinion have arisen; and very few have been found to agree in the details for carrying into effect a general system. The very first attempt in England to introduce a practical reform in the construction and management of prisons failed for want of unanimity in the commissioners appointed by parliament as to the location of the new establishment, though Howard himself was one of the board. From that time to the present, no uniform plan has been generally adopted in England; but as the results of a successful system are great sources of instruction, we shall present our readers with a view of the rise and progress of the plan which is now beginning to be generally adopted in the United States of America, and which affords such encouragement to the hopes of the philanthropic.

At the very time when Howard was devoting every power of his mind and body to the discovery and discloure of the evils of imprisonment, the society of Friends in Philadelphia, acting on the principles of the wise and benevolent founder of their sect, were endeavouring to abolish the use of some of the cruel and injudicious modes of punishment thenpractised (such as the pillory, the scourge, &c.), and to substitute for them, as well as for capital punishment, the milder, and, as they believed it would prove, more efficacious measure of imprisonment for a longer or shorter period, according to the nature of the offence. Their efforts were interrupted by the revolutionary war; but, after the adoption of the Federal constitution, they again urged their views upon public attention with so much perseverance as to succeed in a great part of their object; and it is said, by one well qualified to judge, that, "so mature were the views of the early reformers, that, had they been fully carried into effect, many of the evils afterwards experienced would have been avoided."* They so far succeeded as to impress upon the community the propriety of commuting the system of punishment previously in use for imprisonment, excepting in the case of a few of the most atrocious crimes, for which death was still to be inflicted. For some years this scheme was regarded as a triumph of humanity. It saved the lives of many, and the infliction of a gross and unwise corporal punishment upon more. It was at first much dreaded by the criminals themselves; and the labour, which was intended to constitute part of their punishment, was found to relieve the state from a great portion of the expence which was anticipated, and had been regarded as the greatest objection to the plan. It extended gradually through most of the states of the Union, and was, on all hands, applauded as a cheap and efficient substitution of correctional discipline for cruel inflictions. After a time, however, it became apparent that the guilty were not reformed; the dread of the state prison wore off; recommitments multiplied; and from the facilities of communication which existed among the prisoners, most of them came out worse than they went in; while the system of stint and over-stint, by which they were permitted to labour for their own benefit, after performing a certain task for the state, enabled them to leave the prison supplied with the means of new roguery, or with a fund for subsistence till the approach of winter, perhaps, rendered it convenient to secure a comfortable maintenance in confinement by the commission of a state prison offence. As prisoners increased in number, and became, by their mutual action, more and more corrupt, and, by a natural influence upon the character of many of the inferior officers, were allowed more extended privileges, the expense of these establishments increased, so as to become greatly burdensome. It was generally acknowledged that crime had not diminished; it was believed by many, and feared by most persons, that the penitentiary system had failed. Still the public mind revolted against recurring to the old system of punishment, or relinquishing a scheme which, for twenty years, had been the subject of general encomium. There was, perhaps, a morbid sensibility upon the subject, which was disposed to make the condition of the guilty too desirable in many respects; but this served the purpose of stimulating the efforts of the wise and discerning to produce some plan which should combine a proper degree of lenity with a just and necessary severity. Much was written upon the subject; many experiments were tried, and the general current of opinion seemed to be inclining to a system of strict solitary confinement. On this idea, the construction of the Auburn prison was begun in 1816; and in 1821, an act was passed by the New York legislature for subjecting convicts, either wholly or partially, to solitary confinement, according to their degree of depravity, and also requiring that *each prisoner should be lodged in a separate cell*, as soon as there was a sufficient number of cells. This was, perhaps, the most important step in the introduction of an improved prison discipline. It is, at least, one which is indispensable wherever any attempt is to be made towards the introduction of any valuable plan of correctional punishment. The means of solitary confinement at night, and either of solitary labour, or of labour in small classes together during the day, are essential to the existence of the system of prison discipline, which is now most highly valued. Other things are also necessary, but these lie at the foundation of the system.

In the year 1824, Messrs Hopkins, Tibbets, and Allen were appointed commissioners to visit the state prisons of New York, to examine the state of their discipline, and to report upon any improvements, which, in their opinion, ought to be introduced. The result of the wise labours of these excellent men was the perfecting of a scheme of prison discipline, which had been partially begun already at Auburn, and which is substantially the model on which the reforms attempted in most of the other states have been conducted. It consists, principally, of the solitary confinement of the convicts during the night, and the time of taking their meals; of labour during the day; and of silence at all times, except for the purposes of communication with their keepers; they are never allowed to address each other, not even by signs or looks. The strictest supervision is, of course, necessary, to secure uninterrupted and industrious labour, and to prevent the evil communications which would otherwise abound. The advantages of this system are, that it affords opportunity alternately for silent and solitary reflection, for the salutary action of the mind upon itself, and for that mental activity upon other objects, and that relaxation from the severer task of thinking, which is at once necessary to preserve the healthy state of the mind and body, and to give efficacy to the meditation which is thus encouraged. But this alternation of labour and reflection is not the only, nor, perhaps, the greatest advantage of the plan. The unaided thoughts of the corrupt and hardened might recur to topics which would be any thing but salutary; but, in the silence and darkness of night, the voice of religious instruction is heard; and if any circumstances can be imagined calculated to impress the warnings, the encouragements, the threats, or the hopes of religion upon the mind, it must surely be those of the convict in his cell, where he is unseen and unheard, and where nothing can reach him but the voice which must come to him, as it were, from another world, telling him of things which, perhaps, never before entered into his mind; telling him of God, of eternity, of future reward and future punishment, of suffering far greater than the mere physical endurances of the present life, and of joy infinitely beyond the pleasures he may have experienced. These instructions frequently discover to the guilty tenant of the cell, what seems often not to have occurred to him, the simple fact that he has a spiritual nature, that he is not the mere animal which his habits and hitherto uncontrolled propensities would indicate. And this is a discovery which, alone, may and does effect a great change in a man's whole character. He feels that he is a being superior to what he had thought himself, and that he is regarded as one having higher powers than he had supposed. This first step in the path of improvement is a prodigious one; a new ambition is awakened, and the encouragement of it is the principal thing now needed. This encouragement it is part of the system to give. The spiritual guide of this outcast flock must study the character and previous circumstances of every individual; he must adapt himself and his instructions to their wants; he must teach the ignorant, arouse the careless, touch, if it be possible, the impenitent, lead the willing, and be "all things to all men, if by any means he may save some." To the morning and evening services of devotion are to be added the more direct and elaborate instructions of the Sabbath, and the no less important influences which may be effected in private intercourse with the convict. The Sunday school may communicate the most valuable information on many subjects; and every improper influence may be, and ought to be, absolutely excluded. It is this system of addressing the intellectual and moral qualities of man, of treating the convict as a being of a compound nature—both physical and spiritual—that constitutes the peculiar merit of the prison discipline, which is now about to be introduced. No new discovery has been made, unless it be considered on that criminals may sometimes be made susceptible of moral influences. It is only the adaptation of well-known principles to a new class of subjects. It is merely carrying to the lowest, the most ignorant, and the most degraded class, that plan of education which is nearly universal among us, and which should be entirely so every where. The exercise of mere force, which has been so long considered the only means of punishment, is at length yielding to the rapidly strengthening conviction of the superior efficacy of moral influence.[*] There are yet many to whom this notion appears strange; who are not convinced that the hardened criminal can be persuaded by any thing but stripes or chains; by physical suffering, in short, in some one of its many hideous forms. To this it may be replied, in the first place, that if nothing else can affect him, corporeal inflictions alone certainly will not. Bodily suffering, imposed by his fellow mortal, has rarely awakened in the criminal any thing but fear, hatred, the obdurate spirit of revenge, or despair, sullen, dark, and terrible. In the next place, experience has proved that those who are, apparently, the most hardened in a course of crime, may be operated on, may be positively reclaimed, by the use of moral and intellectual means. For the evidence of this fact, we refer to the Third Report of the Boston Prison Discipline Society, where it is stated in a manner which seems to us conclusive. Again, it may be remarked, that even on the supposition that the experienced villain could not, by any possibility, be reformed, that the crimson dye could not be washed out, it by no means follows that mortal influences may not be usefully applied within the prison walls. The class of incorrigible reprobates is small. The great majority have committed their offences, either through deplorable ignorance, which may be removed; through the power of temptation, against which they may be strengthened; or through the inexperienced rashness of youth, which may be better trained.[†]

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* A Treatise on State Prison Punishments, by the hon. S. M. Hopkins.

It may be imagined by those to whom the subject is new, that the application of these means must be expensive. But, in fact, the direct expense of prisons, conducted upon the former system, is ten-fold greater; and the indirect cost, or that which arises from the education in crime, given by that plan of mutual instruction in villany, is incalculable. The labour, which is an essential ingredient in the scheme, may, by proper management, be made so productive, that the prison shall support itself, including the salaries of all the officers; and in many cases, in America, much more has been done, a large revenue accruing to the state from the labour of its convicts. Such effects to the same extent are not to be expected in other countries, where the value of labour does not bear so high a proportion to the necessaries and luxuries of life; still, wherever the labour of an able-bodied man will support him without, it may be made, by judicious management, to support him within, the walls of the prison. The distinction which is made between the productiveness of voluntary and that of involuntary labour does not hold; for it is one of the effects of the Auburn discipline, to make the labour voluntary, and we venture to say, that under no circumstances, not even where the stimulus of profit is applied in its greatest extent, is there better evidence of active and willing industry than in well conducted prisons. What is done in one place may be done in another, by skilfully adapting the labour of the prisoners to the wants of the community, of which they form a part, and to the personal powers and knowledge of the convicts. But it is not upon its economy that we should choose principally to rest the claims of the Auburn system of discipline to general favour. It certainly should not be forgotten or omitted in the enumeration of its advantages, and it may be an important inducement to its introduction. But of what moment is it, compared with the great object of relieving society from insecurity of life and property? Of what importance is it, compared with the still more glorious purpose of reclaiming the wandering, the lost, the outcast wretch, who may yet be made the source of the joy which is felt over the repenting sinner? It is not a mere fiction of the imagination, that such effects may be produced. They have been produced. It is well known that rogues have a great dread of the prisons where this system is introduced; that they resort to other places to commit the offences which would expose them to its restraints; and that many have been restored by it from habits of profligacy, to those of, at least, comparative virtue.[*] Such results as these are of incalculable value. They cannot well be estimated by the cost of the means of producing them; and were it more expensive than other systems, this would be but a trifling objection to a plan which resulted in the attainment of such beneficent ends. But, as the facts are, no sufficient objection can be made to the endeavour to introduce a system which, after long trial, has produced no evil and much good. The more it is extended, and the more faithfully it is carried into execution, the more will its excellent tendencies be developed; and it is only from the imperfection of the agents, or the slight degree of attention which is given to the subject, that any doubt can arise as to its utility, or its practicable nature. The most important requisite to its successful execution is, the suitable qualification of the superintendent: and it is no ordinary combination of powers and qualities, which will render a man fit to take charge of the refractory subjects of legal punishment. He must be one whose moral correctness of deportment is above suspicion; he must unite to sagacity in the discernment of character, knowledge of the world, and an acquaintance with the most suitable species of mechanical labour, the best manner of executing it, and the proper results to be obtained from it; he must combine firmness with essential kindness of disposition; he must be a man of an exact and methodical mind; and, above all, he must be willing, in the spirit of Christian benevolence, to devote himself exclusively, and with singleness of purpose, to the great objects which may be attained by his agency. These are, certainly, high qualifications; but they are not so uncommon as to justify any thing like despair of obtaining them. The end to be gained is worth the exertion necessary to secure the means. The subordinate officers of a penitentiary should also be men upon whose integrity and competent acquaintance with the department they have undertaken, unshaken reliance may be placed; men whose characters have been proved trustworthy. By officers of such merit, much may be done towards introducing a valuable state of discipline, even under unfavourable circumstances. But in order to secure the great advantages of the best system of prison discipline, it is equally necessary that the buildings should be constructed with a view to its introduction. For this purpose, the plan which seems to us the best, is that which was first adopted at Auburn, and has since been imitated in many places. The workshops connected with the dormitories may be arranged according to the kind of labour to be exercised, and the judgment of the managers or superintendent. We have observed that this is the plan which appears to us the best; but in order that the reader may have some means of judging of the comparative merit of this scheme, and that of solitary labour, we shall also state the plan of the prison which has been begun, upon a vast scale, at Philadelphia, with the intention of confining every prisoner to his cell, excepting for a little time daily to be given to exercise in the open air, in a court connected with his cell. The following account and observations are taken from the Third Report of the Boston Prison Discipline Society:—"*Construction*. The yard wall, which is built of stone, thirty feet high, encloses nearly twelve acres. The building for the keeper's house, and the offices of the prison government, makes a part of the south wall, on each side of the centre. The magnificence of this part of the prison may be inferred from the fact, that the yard wall cost about 200,000 dollars. On the centre of the yard is erected the observatory, and on seven lines, diverging from the observatory towards the wall, the blocks of cells. Two rows of cells are arranged on each of these lines, with a passage between them. The cells are one story high. Connected with each cell, on the outside, is an exercising yard. The entrance to the cell is through the exercising yard. The place of observation for the keeper over the prisoner, is through a small orifice opening from the cell into the passage, which may be closed at pleasure by the keeper, and which is intended to be kept generally shut. The only mode of seeing the prisoner, while confined in his cell, if the doors are shut, is through this orifice. When he is let out of his cell into the exercising yard, he may be seen either by opening the door of the exercising yard, or by walking on the top of the wall over the exercising yard. The wall of the exercising yard is so high, that he cannot be seen from the principal observatory, in the centre of the large yard, unless the observatory is raised to a height far above that contemplated in the original plan. The entrance to the cell, from the exercising yard, is secured by double doors, one on each surface of the wall; the inner door of grated iron, and the outer door of plank. The orifice between the cell and the passage, which is large enough to admit the face of a man, is secured by double doors of plank."—"The estimated expense of the whole establishment when completed, on the original design, is 500,000 dollars. And when it is completed, it will accommodate only 250 prisoners. The expense of the new prison in Connecticut, for the accommodation of 136 prisoners, was estimated at 30,000 dollars, and three-fourths of the work has already been done within the estimate." An obvious remark upon these statements is, that economy is decidedly favourable to the Auburn plan; and although, as we have remarked, economy is not to be regarded as its principal recommendation, yet, unless some decided advantage is to be gained by a more expensive system, it ought to be preferred. Many evils were anticipated as likely to arise from imprisonment on the Philadelphia system, which was originally that of absolute solitude without labour; but the introduction of labour remedied some of these, and others seem not to have occurred. We learn from the report of the Inspectors of the prison, dated January, 1832, that "the general health of the prisoners has been good," and that "the opinion heretofore expressed, that the practical operation of this institution is beneficial to the moral, and not injurious to the physical, powers of the prisoners, has been confirmed by another year's experience and observation." It is thought, also, that "the prisoners can generally maintain themselves by their labour in solitude." In all this, however, we perceive no advantage of this system over that of united labour. What is here said of the Philadelphia plan may be said also of that of Auburn, and, in some respects, with much greater force; and there are some obvious points of inferiority, besides that of increased expense, the effect of which is not counteracted, so far as we can yet perceive, by any decided advantage. Thus, for instance, there is no chapel, and there can, of course, in conformity with the plan of total seclusion, be none of those public services of religion, which, by judicious management, may be rendered so serviceable in the great cause of the reformation of the unhappy convicts. Many excellent kinds of hard labour cannot be practised in solitude; and thus the chances of preserving health* are diminished, as well as the revenue arising from the labour of the prisoners. The difficulties of supervision are also much greater. Perhaps further experience may show some great benefit which will be derived from absolute solitude, that will more than counterbalance these and other disadvantages, which might be enumerated. But, as far as our information now extends, we are disposed to recommend the Auburn plan, as possessing superior advantages of economy, and greater facilities for instruction, discipline, and healthful labour.

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[*] It may be proper to say, that, by the term *moral influence* we mean not merely the effects which may be produced by the inculcation of correct moral principles, but the influence of every motive that can be addressed to the understanding or the affections.

[†] "After spending much time among prisoners," says Mr Hopkins, "and seeing much of the desolations of crime, I have not ceased to feel that, bad as these men are, there is much in their condition to call for our pity, even without looking to the realities of a future retribution. Certainly, their very crimes deserve our commiseration. When we see some left without guidance or instruction in youth: others stupid and gullible, or decoyed into vice by lures of which they could not be aware, or, in possible cases, driven into criminality by pressing want or danger; it is impossible to withhold from them the tear of compassion. I have visited those who, in an agony of grief, told the story of their own ruin. Very few of them are without the sympathies of our common nature. Many at Auburn are often melted to tears under the preaching of an eloquent and able minister there; one who has told me, that, of all congregations, he delighted most to preach to prisoners. I have also heard them sobbing in great numbers, at a few words spoken to them in public, by Mr Powers, in which he alluded to the situation and feelings of their friends. We must avoid extremes in judging of them. They are not the innocent victims of unjust laws; but neither are they all demons. They are men, though greatly fallen. They deserve punishment. They ought to receive it, not less for their own benefit than for that of society."

[*] See Fourth Report of Boston Prison Discipline Society.

It would extend this article beyond all reasonable limits, were we to go into the details of the system of discipline which may be most advantageously practised. Many of these details, too, may and must be varied by the circumstances that occur in the prison, or in the community; and much must, in all cases, be left to the wisdom and the ingenuity of the superintendent, combined with the results of his practical experience. For all the details which can be usefully communicated in writing, we must refer to the reports of the Boston Prison Discipline Society, which contain a very great amount of most valuable information, and are highly honourable to the intelligence, the perseverance, and the elevated principles of their author.* In conclusion, we shall refer to some of the points which are either material to, or intimately connected with, the improvement of the system of prison discipline, and which require more attention than has hitherto been bestowed on them. The first and most essential is, the provision for the religious and intellectual instruction of the convicts. There is not a prison in this country, and we know of none elsewhere, in which what we should consider adequate provision is made, to secure the entire services of an able and faithful clergyman. Yet it cannot be doubted, that the labours of such a one, may be, must be, considered likely to contribute as much as any thing in the whole scheme, to that reformation of character which is contemplated as the great object of all the means of prison discipline. And is it too much to ask, is it too costly an effort, to furnish a faithful teacher of the best principles and highest motives to the sunken and degraded subjects of the authority of the laws? The discipline of the penitentiaries ought to be regarded merely as a part of the great system of public instruction, which it is the boast of this country to have extended farther than others. And as the subjects of this discipline are advanced, not only in life, but in vice; as they have learned much which they ought to unlearn,—the difficulties of instructing them are increased, and even a more liberal provision should be made for them than for others. We lament to say it is, in fact, the reverse; and the best system of prison discipline cannot be said to have been fairly tried, till the scanty pittance provided for the support of a clergyman shall be so augmented as to secure the whole time and talents of competent labourers in this important field. The effects of this plan, as a system cannot be justly exhibited, till it shall have been vastly more extended. It should be carried not only into all our penitentiaries, but into those scarcely inferior seminaries of iniquity, the county gaols. It should be made, as far as the nature of the case will admit, universal, and then it may be judged of fairly; and hardly till then. Its benefits may be made immeasurably greater than have yet been experienced from it, and in a vastly greater ratio of increase than is indicated by the mere number of similar institutions. Connected with the system of internal discipline is the length of time for which every criminal is to be under its influence; and this brings us directly to the criminal code. The power of pardoning has been so much misused, and the danger of its abuse is always so great, that we look upon it as a thing which might very safely be dispensed with. As a part of the same grand system of universal instruction, and a part most highly important to the general welfare, the houses of reformation for juvenile offenders ought to be favourably regarded. They are conducted on the same general plan as the prisons for older violators of law, with such modifications as adapt it to the tenderer years, and more docile dispositions of these useful subjects of punishment. Nothing can have a greater tendency to reduce the number both of criminals and prisons, than the general establishment of houses of reformation.

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* From the same report of the inspectors of the Philadelphia prison above referred to, we learn that the average of deaths that have occurred, from all causes, during the last year, is rather less than six per cent. on the whole number of prisoners. This exceeds the average of some other prisons, for the same period; thus at Charlestown (Massachusetts), and Auburn, the per centage is two and a half, and at Wethersfield, Connecticut, and Sing Sing, it is three.

PRIVATEER; a vessel of war owned and equipped by private individuals to seize or plunder the ships of an enemy. Such a vessel must be licensed by government, or she is a pirate. It is a matter of just astonishment that a species of warfare so repugnant to all our better feelings, and so inconsistent with the respect paid to private property in warfare on land, should so long have prevailed. It is a relic of the plundering habits of barbarous times. For several ages after the irruption of the northern barbarians, war and plunder might almost be considered as individual rights. Every one might seek his fortune by predatory excursions upon the enemy, by land or sea. The infidel powers bordering on the Mediterranean covered that sea with small piratical vessels, and the Christian states, partly in self-defence, partly from hope of gain, fitted out small cruisers, or armed their merchant ships. No public commission was required. The first check to the practice of private plundering upon sea was by confining the right to those who received letters of marque or reprisal. These were issued upon the petition of a subject who complained of injustice done him by some foreign prince or subject, and they empowered the party to obtain satisfaction by seizing the goods of any subject of the offending state. It does not seem to have been considered necessary to be provided with letters of reprisals till the fourteenth century, and no mention is made of them in treaties prior to that time. It is probable that, in the fifteenth century, commissions began to be issued to private subjects in time of war similar to those which were granted for making reprisals in time of peace; but the practice of granting commissions to privateers did not become general before the end of the sixteenth century. The first instance in which their aid appears to have been considered important in carrying on war was in the contest between Spain and her revolted provinces of the Low Countries, which began in 1569. In 1570, the prince of Orange, in the hope of replenishing his impoverished finances, by seizing on the money sent from Spain to the Netherlands, issued commissions to many of his adherents, authorizing them to cruise against the ships of Spain. A considerable fleet was equipped, and, increasing daily in numbers, they soon became terrible by their depredations, not only on the commerce of Spain and the Netherlands, but on that of their own and other countries. It is said that their country suffered from them not less than from the despotism and cruelty of Alva. The French, however, were probably the first to send out in considerable numbers these scourges of the sea. Their code exhibits the most ancient regulations concerning privateers, and their maritime laws have always been the most severe against the commerce of neutrals. In 1555, the people of Dieppe fitted out nineteen ships and six brigantines, in consequence of having received a commission to attack several Dutch ships of great burthen, returning from Spain. Spain and England, shortly after the depredations committed under the commissions of the prince of Orange, issued commissions to great numbers of privateers. The expeditions of Drake and Frobisher are said to have been of this nature. The Dutch war for independence, which began in 1569, did not end till 1648. In that long contest, the use of privateers became familiar, and has remained so since in all wars between maritime countries, and governments have greatly encouraged them. The evils suffered from them and the complaints of neutrals have been so great, that various expedients have been resorted to for checking their excesses; but it has been hitherto found impossible to impose effectual restraints upon forces called into action by motives so sordid. Considering the injustice and immorality of privateering, the many seamen thrown by it into prisons, and thus taken from the service of their country,[*] and the distress thus brought upon their families; the difficulty of procuring sailors to man the fleets, or defend the coasts, when they are lured by the hope of plunder to embark in long and distant cruises; the ill will and jealousy excited in neutral nations by the vexation to which their commerce is exposed from it; the murders and piracies which it inevitably produces, and the injury done to the morals of the communities engaged in it,—it is strange that the example of the United States of America in their treaty with Prussia, in 1785, has not been more imitated. That treaty provides that "neither of the contracting powers shall grant or issue any commission to any private armed vessels, empowering them to take or destroy trading vessels." (For the laws respecting captures by armed vessels, whether public or private, see *Prize.*)

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* The reverend Louis Dwight, secretary of the society.

PRIVET (*ligustrum vulgare*); a European shrub, allied to the lilac. The leaves are lanceolate, entire, opposite, and smooth; the flowers small, white, slightly odorous, having two stamens and a single style, and disposed in terminal panicles. The berries are usually small and globular, purple or black, and remain on the tree during the winter season.

PRIVILEGE; any kind of right, prerogative or advantage attached to a certain person, condition or employment, exclusive of others.—*Privilegium canonis* is the protection of a Roman Catholic clergyman, by which every person is excommunicated who strikes him. The pope only can suspend this excommunication. The word *privileged* was very frequently used in the French republic, as the odious privileges of certain orders mainly contributed to produce the revolution.

PRIVY COUNCIL in Great Britain. (See *Council, Privy.*) *Orders in council* are orders issued by the king, by and with the advice of his privy council, either by virtue of the royal prerogative, and independently of any act of parliament, or by virtue of such act, authorizing the king in council to modify or dispense with certain statutory provisions, which it may be deemed expedient, in particular conjunctures, to alter or suspend. When a permission is to be given to a particular individual, it is usual to grant it by license; but orders in council are of a more general nature, and contain dispensations or prohibitions extending to a whole branch of commerce.

PRIZE. By the term *prize* is generally understood any thing captured in virtue of the rights of war (*jure belli*). Property captured on land is usually called *booty*, and is generally disposed of at once by the commanding general, or reserved for the disposal of his sovereign, who is accustomed to bestow and distribute it according to his discretion. Few rules are therefore to be found in treatises of public law on the rights of war, in regard to captures on land. The conqueror, indeed, generally respects private property from motives of policy or clemency. He observes, or ought to observe, the terms of capitulation, if there are any; and, ordinarily, he does not give up any place which is conquered to pillage or sack. But property captured in battle of a general or moveable nature is commonly subjected to immediate distribution; and the principal question which arises is how it is to be treated upon recapture. Is it to be restored by the law of postliminy (*jus postliminii*) to the original owner, or does it belong to the recaptor? In general, upon principles of strict law, if the capture has been absolute, and the possession complete by the enemy, it is deemed his property, and the title of the original owner is divested, so that he cannot reclaim it. But most nations have introduced into their own laws some modifications of this principle, and, in regard to their own subjects, have given a right of restitution to the original owner, upon his making some compensation. For the most part, however, these modifications are applied more extensively to captures at sea than to captures on land. In regard, to maritime captures, a very different course has been pursued by all nations, in modern times, from that which governs in cases of captures on land. As all nations have an equal right to navigate the ocean, and to carry on commerce with each other, belligerents are bound to respect the rights and property of neutrals, whether navigating the ocean or engaged in trade in foreign ports. The right of belligerents to capture the property of their enemies on the sea is admitted, as well as their right to prevent any frauds, or violations of the law of nations on the part of neutrals. But these rights are limited, and must be so exercised as not to intrench upon the independence or rights of other nations. Now it is obvious that it is extremely difficult, if not wholly impracticable, to ascertain, with entire certainty, what ships and cargoes sailing on the ocean, or found in belligerent ports, belong to enemies, and what to neutrals. Yet it is the duty of the belligerent sovereign, who exercises the power of capture, to abstain from seizing the one, while he may lawfully seize the other. Some mode of ascertaining the character and genuineness of each must therefore be devised, in order to prevent the abuse of the power, and to secure to neutrals a just protection. The belligerent acts at his peril, and is responsible for every abuse; and, if the wrongs are at once flagrant and frequent, they inevitably produce that state of national irritation and national injury which are the general causes of war. Hence arises the necessity of instituting some tribunals to take cognizance of maritime captures, to ascertain their validity, and, after suitable proceedings, to pronounce a decree of condemnation or acquittal. Accordingly, in modern times, it is settled, as a part of the law of nations, that every belligerent has a right to establish tribunals of prize, to examine into all maritime captures, and judicially to decide upon their validity. The final sentence, when pronounced, is deemed the act of the sovereign, deliberately adopted, and he thereby becomes responsible to all foreign nations for its correctness. But this right would be of little practical value, if other nations were not bound, so far as the property in controversy is concerned, by such a sentence. Hence, as a corollary flowing from this principle, it is another well-settled principle, that the courts of prize of the captors have exclusive jurisdiction over all matters touching captures made under the authority of their sovereign; and the courts of other nations have no jurisdiction, or authority to inquire into, or to adjudicate upon them. And the sentence of a court of competent jurisdiction once pronounced becomes conclusive, and obligatory upon all the world. It changes the property, and divests the former title of the owner, if it is a sentence of condemnation; and all nations are bound to respect the new title acquired under it.

I. It being, then, a fundamental principle that, in matters of prize, exclusive jurisdiction belongs to the prize courts of the captors, whose sentence is conclusive upon all the world, we are next to inquire, under what circumstances this conclusive jurisdiction attaches. It is not permitted to any nation to assume to itself the final adjudication upon all rights of property in which the subjects of other nations are concerned, whenever a court of prize has undertaken to pass sentence upon it. Such a sentence is not obligatory, unless a rightful jurisdiction has attached to such court; and, therefore, in all cases where property, captured and condemned as prize, comes afterwards in judgment before the courts of other nations, and the title is controverted, the first question is, whether the court of prize pronouncing the sentence had jurisdiction over the property. The foundation of its jurisdiction is, that the property has been captured, and is in the possession of the captors, and capable of being reached directly or indirectly through the process of the court. Every court of prize, therefore, proceeds *in rem*, and, in order to maintain its jurisdiction, it must be capable of asserting its claim over the thing or over its proceeds. The jurisdiction, then, gained by capture is lost by a recapture, escape, or voluntary discharge of the property before the court has adjudicated upon it; and if notwithstanding, it should attempt to bind the property by any subsequent proceedings, its sentence becomes a mere nullity. Upon this ground, it was formerly held that, in order to entitle a court of prize to proceed to adjudication, it was essential that the property or proceeds should be brought within the ports of the capturing power. But this rule was soon found, in practice, to be too narrow and inconvenient; and it is now well established, that it is sufficient that the property is in the possession of the captors in the ports of an ally in the war, or even in the ports of a neutral, for, by the capture, the captors acquire such a right and possession as no neutral nation is at liberty to divest or impugn. This rule is so inflexible that, even if a belligerent captures a neutral vessel and cargo, and brings it into the ports of the neutral nation to which the vessel and cargo belong, the courts of the latter are bound to abstain from all exercise of jurisdiction over the property, except so far as to inquire whether the captors are entitled to make the capture, or are mere pirates. And this leads to the remark, that the capture must be made in a place where it can, by the law of nations, be rightfully made by the belligerent. Every neutral nation has a right to an exclusive jurisdiction within its own ports, and over its territorial seas to the extent of a marine league on its sea-coast. A belligerent has no right to make any captures within those limits; for it is undertaking to carry on war within the neutral territory, which is a plain violation of neutral rights: so a belligerent has no right to equip, or arm, or man, his ships for war in any neutral port; and, if he does it is the duty of the neutral to vindicate his his own exclusive sovereignty. If therefore in either of these cases of violation of territorial sovereignty, or of illegal equipments, the captured property is brought within the neutral jurisdiction, it is the right and duty of the neutral to restore it to the original owner.—A prize court may not only lose its jurisdiction by circumstances occurring after it has once rightfully attached, but it may be incompetent from the locality of the exercise of its jurisdiction. Thus a prize court must sit in the country of the captors, or, at least, in the territory of a co-belligerent; for if it sits in a neutral country, its sentence of condemnation will be deemed invalid, and, of course, will be disregarded as a violation of the proper duty of the neutral sovereign.

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[*] It is said that, at the close of the war terminated by the peace of Amiens, there were 30,000 French sailors in British prisons.

II. The next inquiry is, Who are entitled to make captures? In general, every belligerent sovereign reserves to himself the exclusive right to grant commissions to make captures in time of war. The object of this regulation is, in the first place, to secure neutrals against predatory warfare and piratical attacks; and in the next place, to enable the sovereign to limit the operations of war, and control the persons who are engaged in it so as to secure a perfect responsibility to himself for any misconduct. But unless the sovereign actually prohibits any uncommissioned subjects from engaging in the war, they are not absolutely incompetent to make captures; for all the subjects of the hostile nations are deemed enemies to each other. But such captures are always made at the peril of the parties; and the uncommissioned captors acquire no interest therein, but the same are at the free disposal of the sovereign. Indeed, the general principle of the law of nations is, that all captures are for the sovereign; and no beneficial interest can be acquired therein by the captors, except by the grace and bounty of their sovereign. It is usual for the sovereign, in cases of public ships of war, as well as in cases of private commissioned ships, to give the captors, after adjudication, the whole of the proceeds of prizes, according to some stipulated mode of apportionment and distribution. But this is a mere act of grace, and not of duty. In cases of non-commissioned vessels, captures may certainly be made by them in self-defence, if they are attacked; and they are usually permitted to make hostile attacks and captures, which are not in mere self-defence. Indeed, so far as other nations are concerned, such captures are to be deemed lawful and not piratical; though, if not authorized by their sovereign, the captors may incur an onerous responsibility to him. And, with a view to the exigencies of war, it is a general policy among sovereigns not to allow any rights to vest in the captors until after a final sentence of condemnation, so that, if any intermediate negotiations take place, the prizes may be restored without any infringement of the vested rights of the captors.

III. In the next place, Who are to be deemed *enemies?* and what property is liable to capture? In general, it may be laid down that all the subjects of the belligerents are to be deemed enemies to each other, and their property is deemed to belong to enemies; but the rule has some qualifications. In cases of prize, the question of enemy or not, depends, not upon the native or adopted country of the party, but upon his actual residence or domicil. He is deemed to belong to the country in which he has his actual residence or domicil. Hence a neutral domiciled in an enemy's country is deemed an enemy, and a subject of a belligerent domiciled in a neutral country is deemed a neutral; and the masters and officers and crews of ships are deemed to belong to the country, and to possess the national character of the ships in which they are employed during the time of their employment. And the hostile character may be impressed upon a person who goes into a belligerent country originally for temporary purposes, if other objects of a more permanent nature become engrafted upon that original purpose. *Ambassadors* and *public ministers* are always deemed to retain the national character of their sovereigns; and so *consuls*, while they confine themselves to their mere official duties. But if they engage in commerce, so far as their commerce is concerned, they partake of the national character of their place of domicil. A national character which is acquired solely by domicil ceases with the change of that domicil; and the native character of the party is resumed, the moment he puts himself upon his journey (*in itinere*) to return home. Thus a belligerent subject, domiciled in a neutral country, ceases to hold the character of a neutral as soon he is on his return to his native country, and becomes an enemy; and, *e converso*, a neutral domiciled in an enemy's country ceases to be an enemy upon his return to his own country. But mere residence in a neutral country is not always sufficient to protect the property of a party from being deemed hostile; for there may be a hostile character impressed upon the property by the mere nature of the trade in which the party is engaged. Thus if a party reside in a neutral country, but has an agent stationed in the enemy's country, who carries on trade there on his account, upon the same footing as a resident merchant and privileged trader, he will, as to such trade, be deemed an enemy. So if a neutral person is a partner in a house of trade in the enemy's country, the partnership is deemed hostile; and his neutral residence will not save his share in the concern from being liable to confiscation as enemy's property. But here the principle of reciprocity is not applied; for if an enemy be a partner in a house of trade in a neutral country, his share in the concern is not protected by the neutral character of the partnership; but his character as enemy attaches to it. There are many other cases in which traffic alone, independent of domicil, stamps upon the party engaged in it a hostile character. Thus if a party be engaged in the navigation of an enemy, or his ships sail under the flag, and pass, and papers of an enemy, the property so employed partakes of the hostile character. There are certain species of trade which are ordinarily confined to the subjects of a nation; and no foreigners are permitted to take part in such trade. Thus, before the late South American revolution, Spain prohibited all foreign intercourse with her continental colonies. In such cases of colonial monopoly, if, by special privilege or license, a foreigner should, *pro hac vice*, be allowed to carry on the trade; or if, under colour of the names of subjects, he should secretly embark in it, his property so engaged would be deemed hostile. Great Britain has attempted to maintain a further principle, that neutrals shall not be allowed to carry on any trade with colonies in time of war, which is not allowed them in time of peace, contending that if the ports are generally opened during war, so as to ward off its pressure, it ought to be deemed a privileged trade, and subject the property to confiscation. America has resisted this extension of the doctrine, asserting it to be new, and not founded in the law of nations. So the coasting trade of a country is so generally confined to its own subjects that it is deemed a privileged trade; and the property of neutrals engaged in it is treated as hostile. And the produce of an estate situated in a hostile colony has been held to be impressed with the character of the soil, although the owner of the estate is resident in a neutral country; and, as to such produce, he is deemed an enemy. A peculiar rule has been applied to certain European factories established in the Eastern and Asiatic nations. These factories are deemed to possess the national character of the countries to which they belong, and not that of the countries where they are situated. The same rule has been applied to European establishments in Smyrna and other Turkish provinces. But the property of enemies is not always liable to capture, for the government itself may limit the operations of war; and certain property is, by the law of nations, exempted from capture. Thus vessels which are cartels, or are sailing under the license flag and pass of the government, cannot be seized as enemy's property; for they are protected by the express or implied authority of the government itself. And it is not uncommon for the government, by special instructions, to limit hostilities. Thus fishing vessels are often exempted from capture, though belonging to the enemy.

IV. Under what circumstances neutral property becomes subject to capture. 1. Belligerents having a right to capture the property of their enemies on the ocean, wherever it can be found, this right would become utterly ineffectual unless they were permitted to visit and search vessels on the ocean, in order to ascertain whether they and their cargoes were neutral or hostile. The right of search is therefore generally admitted as an incident to the right of capture. It has been, indeed, occasionally resisted; but it seems now firmly established as a part of the law of nations, though it is often used as an instrument of vexation to neutrals. Sweden, in the war between France and England, from 1793 to 1802, attempted to establish an exception, where her own ships, being neutral, were navigating under the convoy of her own public ships. But England made captures of them for resistance of the right of search; and, though much irritation existed at the time, the doctrine maintained by England seems now generally admitted. Neutrals taking the advantage of belligerent convoy will, it is said, not be liable to confiscation, unless they receive convoy orders and co-operate in resistance of the right of search. But this doctrine seems questionable; and the judicial opinions in England and America on this subject are irreconcilable. It may, then, be laid down as a general rule, that neutrals are bound to submit to the right of search; and, if they resist it, the property is liable to confiscation. 2. And the right of search draws after it a right to capture and send in the visited ship for adjudication, whenever (though the ship and cargo are under neutral papers) there are circumstances of just suspicion as to their real character. The neutral, under such circumstances, is bound to submit, and wait the regular result of the adjudication of the proper prize tribunals. If, after the capture, the neutral crew rise, and regain the neutral ship from the possession of the captors, that alone is a hostile act; and however innocent in other respects the ship and cargo may be, they are justly subjected thereby to confiscation. 3. Another cause of the just confiscation of neutral property is that it is contraband of war. (See *Contraband*.) Goods contraband of war are generally those which are peculiarly and exclusively adapted to war, such as military and naval equipments and stores, such as guns, muskets, ammunition, and other articles usually appropriated to war. So ships built for war, and going to the enemy's country for sale, are contraband. Neutrals, being bound to abstain from taking any part in the war, are justly deemed to identify themselves with the enemy by any interposition in it, or by any act against their duty; and if they commit any such acts, they are treated as enemies. Many articles of commerce are of promiscuous use, both in war and peace; and, in general, such articles are treated with indulgence, and furnish no ground for capture. And, especially, articles which constitute the produce and export of a neutral nation are, at all times, though applicable to war, treated with indulgence. But if such articles are directly destined for the military or naval use of the enemy, they will then be subject to confiscation, although they are of promiscuous use. Thus ship timber and naval stores, destined to the ports of military equipment of an enemy, are deemed contraband. So provisions in general are not deemed contraband (although there has been much conflicting discussion on the subject), being of promiscuous use; but provisions destined to the military or naval use of the enemy, or sent to his ports of naval and military equipment, are deemed contraband. In modern times, by the conventional law between nations, provisions have been often excepted from the list of contraband, and are subjected to the right of pre-emption. 4. Another just cause of the confiscation of neutral property is the breach of blockade. Every belligerent has a right to invest the ports of his enemy, to cut off his supplies, and to endeavour thus to compel him to a surrender. And a neutral can have no right to interpose, and relieve the besieged from the pressure of superior force. It is therefore a general rule, that a violation of a blockade, by any neutral, subjects his property engaged in it to capture and condemnation. But very important questions grow out of this subject, which have been the occasion of many heated discussions between neutral nations and belligerents. What constitutes a blockade in the sense of the law of nations, has been a disputed question. The principles now established on this point seem to be, that a mere *paper blockade* (as it is sometimes called)—that is, a blockade by proclamation, without any investing force—is not a legal blockade: there must be an actual naval or military force, competent for its object on the coast and in the vicinity. The port must be actually, and not nominally, invested. If the blockading squadron be withdrawn, or be dispersed by a storm, or voluntarily relax the siege, the blockade is, for the time, intermitted; and an entry by a neutral, at such a time, ought not to involve any penalty. France and England, during the late continental war, attempted—the former by the Berlin and Milan decrees, the latter by orders in council—to declare whole countries in a state of blockade, and to interdict all traffic with them by neutral nations. But neutral nations resisted these pretensions, with a most decided expression of public opinion, as gross usurpations; and the persistence of Great Britain in enforcing these orders of council, was one of the main causes of the late war between her and the United States of America.

V. Another inquiry is, What constitutes a breach of blockade on the part of a neutral? A blockade may commence, and be made known by proclamation or notification of the belligerent government to neutral nations; or it may commence *de facto*, without any such formal notice. In order to affect a neutral with the consequences of a breach of blockade, it should be duly notified to him. Where a blockade is merely *de facto*, the neutral is not in default by approaching the port, if he has no knowledge of the blockade, or if, knowing it, he comes *bona fide* towards the port for the purpose, not of entering in breach of the blockade, but merely of ascertaining, in the neighbourhood, if it still exists. But if he is warned off by the blockading squadron, and afterwards attempts to enter the port, that is a breach of blockade. But a mere persistence in this intention, without any act done after such warning off, is not of itself a breach of blockade. There must be some overt act, such as sailing again towards the port, or hovering near it, with an intent to take advantage of some opportunity to enter, to constitute the offence. But where a blockade is known to the neutral, the sailing from the neutral port, with an intent to break it, is of itself a breach of the blockade. In such a case, nothing will save the neutral from the penalty of confiscation, but the fact, that the blockade, though unknown to him, was, at the time of his sailing, withdrawn; for both intent and breach must concur. A blockade by proclamation or notification may be presumed to be intended to endure; and, therefore, notice of such a proclamation is more binding upon the neutral than a mere blockade *de facto*, whose continuance may well be deemed uncertain, temporary, and liable to sudden changes of intention. In respect to cases of contraband and breach of blockade, in order to justify the capture and condemnation of the neutral vessel or cargo, or either engaged therein, it is indispensable that they should be caught *in delicto*. The penalty, therefore, attaches (generally speaking), only while the vessel is engaged in the same voyage. If that is terminated, the offence is deposited with it, and ended. The rule, however, has been held in a somewhat larger extent by Great Britain, and probably will be adopted by other nations. In cases of contraband, if the vessel has sailed under false papers and disguises, the penalty is inflicted on the return voyage. In cases of breach of blockade, the penalty, if not inflicted before, is applied in the next succeeding voyage, but not beyond that. There are other acts which are deemed violations of the duty of neutrals, and subject their property to condemnation. All these acts may be resolved into one general proposition, that if the act be in aid of the objects or interests of the enemy, or if they amount to an actual interposition in the war, they are deemed hostile. Thus, if the neutral is guilty of any fraudulent conduct to defeat belligerent rights; or if he, directly or indirectly, assists in carrying on the war, prejudicing the rights of the other party, he is treated, so far, as a party. Hence, if he is guilty of a spoliation of the ship's papers, or a fraudulent suppression of enemy interests; if he carries enemy goods under false papers; if he carries despatches, or military passengers for the enemy; if he engages in the transport service of the enemy; if he sails under the special license and pass of the enemy;—these, and other acts of a like nature, will subject his property thus employed to confiscation, and he will be thus far held as enemy. And if the neutral mixes up and covers his own property designedly with that of the enemy, the whole will be condemnable. A court of prize will not assist him to unravel the transaction, but will deem the whole forfeited by his own misconduct.

VI. The question has often been discussed by publicists, how far a neutral has a right to carry enemy's goods, and in such case whether the neutrality of the ship gives a neutral character to the cargo; or, in other words, whether free ships make free goods, and enemy ships make enemy goods. There have been many struggles, in modern times, on the part of neutrals, to incorporate into the law of nations the principle, that free ships shall make free goods. But they have wholly failed of their purpose; and the right, whenever it exists at all, is the result of treaty stipulations, and binds those nations only which are parties to them. The general principle now acknowledged in the practice of nations is, that enemy property found on board of neutral ships is liable to capture and condemnation. The neutral flag does not protect it. And, on the other hand, that neutral property found on board of enemy ships is not liable to condemnation; but the neutral is entitled to restitution. In all these cases, the belligerent is understood, upon the capture, to succeed to the rights of his enemy, and no more, unless there has been some misconduct on the part of the neutral, to make him forfeit the protection of the law of nations. If enemy property is found on board a neutral ship, and the conduct of the neutral is *bona fide*, he is entitled to receive the stipulated freight of carriage from the captors. If neutral property is found on board an enemy ship, the neutral must, if the captors are willing to complete the voyage, pay to the captors the stipulated freight upon due delivery and restitution.

VII. As to the nature and proofs of proprietary interest in ships and cargoes. In the ordinary course of things, the proprietary rights must be judged of by the documents and evidence found on board, and the general principles of national jurisprudence applicable to such subjects. No nation has a right to decide such questions by its own mere municipal regulations, as to the rights of property, but must decide them upon the general doctrines of the law of nations. Every ship navigating the ocean is expected to have on board some papers, which, under proper verifications, shall establish her national character. The usual papers, therefore, which the laws of her own country require as evidence of that character, ought to be on board; and if they are not, that very circumstance creates a suspicion of a false and assumed character. The like rule applies to cargoes; for these are expected to be accompanied by suitable documents to prove the ownership and national character, and to be verified by some public or customary authentications of public officers. The general criterion, therefore, adopted by the law of nations to distinguish the property of different nations found on the sea, is to require the production of such documents as the laws of the nation itself require, as evidence of proprietary interest. But these papers are not deemed conclusive, but only *prima facie*, evidence, until they are impeached. There are, however, some peculiar rules of evidence adopted in prize courts, which require to be mentioned. In the first place, it is a rule of prize courts, in all cases of capture, that the burden of proof is on the claimant to prove a neutral proprietary interest. If he fails so to do, the property is deemed hostile. One reason for this rule is, the difficulty of the captors establishing the contrary, as they have no privity with the shippers; and another is, the extreme facility and frequency of covering belligerent property under neutral disguises in time of war. Another rule is, that the circumstance of property being found on board of an enemy's ship affords a presumption, that it is enemy's property; and that presumption will prevail, until it is clearly displaced by satisfactory evidence to the contrary. Another rule is, that where a party claims under a title by capture, he must show a sentence of condemnation; for though, as between belligerents, the property is, or may be changed by mere capture, neutrals or others purchasing from them, must show a good title under the sale, which can only be by such a sentence. Goods are usually accompanied by bills of lading, invoices, and letters of consignment. But a mere consignment to a party is no absolute proof of property; for he may be the mere agent of the shipper. It is, therefore, a rule, that in such a case, the goods must appear by the documentary evidence to be really shipped on account and risk of the consignee. The consignment must amount to an absolute transfer of the property to the consignee; for, if it is contingent, or dependent upon future occurrences, it is deemed to remain still in the shipper. Thus, if the shipment is made on the joint account of the shipper and consignee, or on the sole account of the consignee at his option, the property, during the voyage, remains in the shipper, and may be captured as his, for, until the option is made, there is no absolute transfer: so, if a sale made during war be conditional or contingent, or dependent upon future acts or circumstances, the proprietary interest is deemed to belong to the vender: so, if the goods are sent by the vender to the vendee without orders, though on account of the latter, the interest remains in the vender. It is also a rule of the prize court, that property cannot, in time of war, be transferred *in transitu*; so that, for all the purposes of capture, it is treated as belonging to the same party, during the whole voyage, to whom it belonged at its commencement. Another rule is, that no lien upon enemy's property by way of pledge, or hypothecation, or for advances made by the consignee, or in virtue of a general balance of accounts due to the consignee, as factor, is regarded in the prize court as sufficient to defeat the rights of captors; nor, indeed, any liens except such known liens as accompany the very goods by the universal commercial law, such as a lien for freight. The reason for this rule is, that the liens created by private persons must be essentially dependent upon and connected with the municipal laws of the countries where the parties live, and the courts of prize would be involved in endless perplexity in the examination of them, and they would open a wide door for the introduction of false and fraudulent claims, which such courts could have no adequate means to detect.

VIII. Another inquiry is, how far the property of belligerent subjects engaged in trade with their enemies, is liable to capture and condemnation. The declaration of war puts (as has been seen) all the subjects of the different nations at war with each other, as well as the nations themselves, in their sovereign capacity: hence all traffic between such subjects being enemies, is prohibited by the law of nations, and not only all traffic and commerce, strictly so called, but all commercial dealings. Therefore, entering into contracts with an enemy, making remittances to him, or paying debts to him, during the war, is deemed an illegal intercourse, which may interfere with the national policy, and, in some cases, paralyze the operations of the war. A belligerent has no right to go into the enemy's country at all without the license of his own government, even for the purpose of bringing away goods which were purchased before the war commenced. The same principle applies to the subjects of an ally in the war; for the duties of each are the same. Hence the property of a subject, or of an ally, found engaged in commerce with the enemy, is liable to capture, and treated as enemy's property; for no person can be permitted to set up in a court of prize a claim to property founded on a violation of the law of nations. And it matters not whether the trade be carried on directly or indirectly with the enemy, directly with the enemy's ports, or indirectly through a neutral port; or whether there be an actual trade, or only an attempt to trade, for the voyage is itself illegal. And if a belligerent be engaged in any trade in violation of the municipal laws of his own country, and the property so engaged is captured, he cannot maintain any claim for it in the courts of prize of his own country; for he cannot be permitted to set up his own offence against the laws to protect his property from condemnation; and his claim being rejected, the property is of course confiscated, as enemy property, for want of a proper claim. If a vessel is captured during the same voyage in which the offence of illegal traffic is committed, although after it has been committed, she is still deemed *in delicto*, and subject to confiscation. And perhaps the same rule of confiscation would be applied to the return voyage, as is applied in cases of breach of blockade and contraband of war.

IX. It is often an important question, how far the acts of the master of the ship bind the owner of the ship and the owner of the cargo. In respect to the owner of the ship, the general rule is, that the acts of the master bind him as much as if the acts were done personally by himself. This rule is established upon the doctrine that the principal is answerable for the acts of his agent, not only civilly, but penally, to the extent of the property intrusted to him. It would be difficult, in any other way, for a court of prize to reach the proprietor himself, however guilty he might be. And, if the rule savours of hardship, it should be remembered, that it is indispensable for the exercise of the just rights of war, and to enforce the just duties of neutrality. If the master has acted in contravention of the instructions of the ship-owner, he will be responsible to the latter. If, therefore, the master deviates into a blockaded port, the owner is bound by his act, and is not permitted to aver his ignorance, or that the master acted against orders. The same principle applies to the carriage of contraband goods. Grotius, and Bynkershoeck, and Pothier, have contended for a more favourable rule, where the owner is ignorant that contraband goods are taken on board. The rule, however, has been established by modern practice against their opinions. But the acts of the master of the ship do not bind the owner of the cargo, unless he is also owner of the ship, or he has knowledge of the unlawful intention, or the master is his agent. In cases of blockade, the deviation into the blockaded port is deemed to be in the service, and for the benefit of the owner of the cargo, and therefore he will be bound by the act, if he had knowledge of the blockade at the time of the sailing of the ship; so if, at the time of the sailing of the ship, the master puts himself under convoy of the enemy, it will be presumed, that it is done with the consent of the owner of the cargo. But where, from the nature of the act occurring during the voyage, upon an emergency which could not have been foreseen by the shipper, it is clear that it is done without the consent of the latter, the act will not bind him, although the master is his agent. But it will be different when the act might have been in the contemplation of the parties at the beginning of the voyage; for, in such a case, ignorance will not be allowed to excuse the shipper from the legal results of the act of his agent. There are many cases in which the acts of the master will bind the owners, both of the ship and the cargo: such are the resistance of the right of search, the rescue or recapture of the ship by the master and crew after capture, and the fraudulent suppression and spoliation of papers. It has been an agitated question, whether the resistance of a right of search by a belligerent master binds neutral property on board, although it is admitted that the resistance of a neutral master will bind all goods on board, to whomsoever belonging. The English prize courts have adhered to the affirmative, and the American prize courts to the negative. And where a person is the general agent of the whole cargo, and he covers enemy property in the ship with his principal's property, the whole will be liable to condemnation, although his principal had no knowledge of the illegal act; so if he uses simulated papers; for the carriage of such papers is emphatically said to be an efficient cause of condemnation.

X. The rights and duties of captors. 1. From what has been already stated, it is manifest that, in many cases, it will be impossible to ascertain, from the examination of the papers on board of a ship, which is visited at sea, whether she is a neutral or belligerent, and whether she is condemnable or not. The captors therefore make the seizure at their peril; and if it turns out to be unjustifiable, they are responsible for all damages and costs arising from their act. If, on the other hand, the capture is justifiable, the captors are exempted from all liability for damage and costs, whatever may be the event, and even though the property may be restored by the prize court as neutral. They may even be entitled, in case of restitution, to be paid their own costs and expenses, where their conduct has been entirely correct. The captors, upon a justifiable capture, are considered as having a *bona fide* possession; and they are not responsible for any subsequent losses or injuries to the property from mere accident or casualty, as from stress of weather, recapture by the enemy, shipwreck, &c.; but they are responsible for all losses to neutral property which are properly attributable to their own negligence. Probable cause of capture is a perfect justification to captors, even though ultimately a restitution may be decreed. It hence becomes a very important point to ascertain what facts and circumstances constitute such probable cause. These may be almost infinitely varied, and it would be impossible to enumerate all of them; but some of the more common cases may be stated. If the ship pretend to be neutral, and has not the proper and usual documents on board to verify her own character and that of the cargo; if the cargo be without a proper custom-house clearance; if the destination be falsely stated; if the papers on board be false or colourable, or be suppressed, mutilated, or spoliated; if the neutrality of the cargo does not clearly appear; if the voyage be to or from a blockaded port; if the traffic be not legal to the parties engaged in it; if the cargo be of an ambiguous character, as to contraband, or its destination be to a port of an ambiguous character, as a port of military and naval equipment; if the conduct of the officers and crew of the vessel give rise to just suspicions of their good faith,—in all such cases (and many others of a like nature might be mentioned), there is sufficient probable cause of capture to justify the captors. If any part of the property is condemnable as prize, though the bulk of the cargo may be restored, that constitutes not merely probable but justifiable cause of capture. But even probable cause of capture will not excuse captors from liability for any loss or damage accruing afterwards from their own negligence or misconduct; for the title of a *bona fide* possessor may be forfeited by such negligence or misconduct. If, therefore, the prize be lost by the negligence or misconduct of the prize officers and crew, from neglect to take a pilot, or from want of a proper prize crew, or from unskilful navigation, or from any impropriety of a similar nature, the captors are responsible to the full amount of the damage. But mere irregularity alone will not make the captors liable for damages, unless there is an irreparable loss properly attributable thereto. 2. Next as to the duties of captors. As soon as the capture of a neutral is complete, it is the duty of the captors to put a proper prize crew on board, and to send the prize into some convenient port for adjudication. The neutral crew, or a part of them, at least, are to be kept on board, and are not to be treated with severity, or handcuffed, or put in irons, unless from extreme necessity. If the neutral crew voluntarily undertake (which they are not bound to do) to assist in the navigation, that may dispense with the necessity of putting on board a full prize crew. Captors are bound to state to the master of the neutral vessel the cause of the capture, so as to give him an opportunity to make suitable explanations, and to show the insufficiency of the reasons to send her in for adjudication. Some stratagems of war are permitted in order to secure captures, (assailing and chasing under false colours) but the law of nations does not permit firing or capturing under false colours. It is the duty, also, of the captors, after capture, to prevent all spoliation and damage by the prize crew, and to abstain from breaking bulk, or removing any of the property, unless in cases of necessity. If any acts of this nature occur, the court of prize will require at their hands a full justification. Upon arrival in the proper port, it is the duty of captors, without delay, to cause proceedings to be instituted in the proper prize court, so that the legality of the capture may be immediately ascertained. In case of any undue delay, they will be made liable for demurrage, if restitution is decreed. And the neutral may himself, by a proper application to the prize court, compel the captors to proceed to adjudication, if they unreasonably delay. In cases of illegal capture, the inquiry often arises, Who are responsible for the damages and costs? In respect to public ships, the general rule is that the actual wrongdoer, and he alone, is responsible. By the actual wrongdoer is meant the commander who has directed the capture; for the subordinate officers and crew, who have only acted in obedience to his orders, are not responsible. However, when any unauthorized act has been done by a prize master, or by a part of his crew, such actual wrongdoers, thus acting without authority, may, perhaps, be made directly responsible. The rule in relation to the actual wrongdoer is so inflexible that, if the capture has been made by a captain under the instructions of the commodore or admiral commanding the squadron, or the station, who is not present at the time of the capture, the sole remedy lies against the actual captor alone, although he may have his own remedy against his superior officer, under whose instructions he has acted. In respect to private armed vessels, a different rule prevails. There the commander is not only responsible, but the owners of the ship also, for all the illegal acts of the commander and crew. And, for the purpose of making this responsibility effectual, on the grant of commissions to privateers, bonds are usually taken, with sureties, as a guaranty against their misconduct.

XI. Recaptures. A recapture may be of the property of a fellow-subject, or of an ally in the war, or of a neutral. It may be from the hands of a pirate or of an enemy. In respect to captures by pirates, no property can be acquired by them, and consequently the capture creates no change of ownership. It is, therefore, to be restored to the original owner, upon the payment of a suitable compensation, commonly called *salvage*, to the recaptors. But, in respect to captures by enemies, the change of property is complete from the time when the capture is deemed firm and secure, whether this be as soon as the surrender (*deditio*) and possession are perfected, or by pernoctation, as holding the possession after capture for a night, or by possession during any other stipulated period, or by carrying the property within the ports and territory (*infra præsidia*) of the capturing power, or by a sentence of condemnation. Various doctrines have at different times, prevailed among nations, applicable to each of these predicaments of the captured property, the general rule being admitted, that the property is changed as soon as the capture is firm and secure, and the question still remaining open as to the time at which it is to be deemed firm and secure. The right of postliminy (*jus postliminii*) is deemed to attach to all property captured, of which there is not such a firm and secure possession. And, therefore, different nations will withhold, or will grant restitution of property captured, according to the principles adopted in their own codes of practice on this subject. The ordinances of many nations have made special provisions on the subject of recaptures. By the law of France (ordinance of 1681), if a French vessel is recaptured from the enemy after twenty-four hours' possession, she is a good prize to the recaptors; and if recaptured before twenty-four hours' possession, she is restored to the owner upon the payment of one third of the value as salvage. But this rule is construed to apply solely to recaptures by private armed ships; for if made by public ships, restitution is decreed without payment of any salvage, whether the recapture be before or after the twenty-four hours' possession. France applies a similar rule to the recaptures of the vessels and property of her allies from the enemy. The law of Spain, in regard to recaptures from the enemy, is similar to that of France. By the law of Denmark, in the code of Christian V., if the recapture be before twenty-four hours' possession, the property is equally divided between the original owner and the recaptors; if afterwards, the recaptors take the whole. By the law of Sweden of 1667, the recaptors are entitled to a salvage of two-thirds of the value, and the remaining third is to be restored to the original owner, whatever length of time the vessel may have been in the hands of the enemy. Some alterations have been admitted into the regulations of these nations, in more modern times, either by positive ordinances, or by the practice of their courts, indicating a considerable fluctuation of opinion; but it is not necessary, and scarcely would be useful, to trace out these alterations in detail. Great Britain and the United States of America have adopted the rule, that the property of the owner is not devested, except by a sentence of condemnation. In respect to recaptures from the enemy of ships belonging to their own subjects or citizens, they are to be restored, upon payment of salvage, if there has been no such sentence. And, by recent statutes (43 Geo. 3, ch. 160, and 45 Geo. 3, ch. 72), British vessels and goods are, upon recapture from the enemy, restored, upon the payment of one-eighth of the value, if recaptured by a public ship, and one-sixth if recaptured by a privateer or other vessel, without reference to the consideration, whether the property has been condemned by a court of prize or not. There is an exception of vessels which have been set forth by the enemy as ships of war. So that, in Great Britain, the right of postliminy continues forever, or, at least, until the return of peace. In the United States of America, the act of congress of 1800 has adopted a rule, similar to that of Great Britain, in all cases where there has not been a sentence of condemnation. With them, therefore, the right of postliminy is extinguished by such a sentence. The salvage is one-eighth to public ships, and one-sixth to private ships, in cases of restitution. But, if the vessel has been set forth and armed for war by the enemy before the recapture, then the salvage is one moiety of the value. In respect to the recapture of vessels, and other property belonging to allies, the rule adopted by Great Britain is the rule of reciprocity. If the ally would restore British vessels and property in a like predicament, then restitution is decreed; if the ally would not restore, then the recaptors are entitled to the whole property. And, in the absence of all evidence of any rule adopted by an ally, the British rule is applied in favour of the ally, until it appears that such ally acts towards British property on a less liberal principle. When the rule of the ally is ascertained, Great Britain then adopts the rule of the ally. America has adopted an equally liberal course. In all cases of recaptures from the enemy of property belonging to nations or their subjects in amity with the United States, where there has been no sentence of condemnation, restitution is decreed, or not, according to the rule which is adopted by such nation in like circumstances towards the United States. But no restitution is decreed after the property has been condemned by the sentence of a competent tribunal. In respect to recaptures of neutral property, the general rule is to restore the property without the demand of any salvage, if the taking by the enemy was without any reasonable cause, and was merely wrongful. But, if the capture was rightful, and the neutral property was liable to condemnation, or, from the known course of practice of the enemy, was in danger thereof, then, as a beneficial service is rendered to the neutral, salvage is demandable. The ground of this distinction is obvious. If the original capture be wrongful, the neutral is entitled to a decree of restitution, with damages and costs at the hands of the captors; and it is no benefit to him to make a recapture. But if the conduct of the neutral vessel, or the nature of the cargo, would subject, or might probably subject, them to condemnation, then the recapture is a benefit to the neutral, and entitles the recaptors to the remuneration. So, if the enemy is in the habit of disregarding the law of nations, and violating all the just rights of neutrals, and refusing them suitable redress, or harassing them with unjust litigation, as, in such cases, there is danger of loss to the neutral, a like remuneration should be paid to the recaptors. Principles of a similar nature are applicable to a *rescue* of a prize by the original crew, or others in aid of them, or by mere strangers. The rescue may be by citizens or subjects of the belligerents, of property belonging to fellow-subjects or fellow-citizens, or by foreigners, of property belonging to foreigners, or by citizens or subjects, of property belonging to foreigners, or by foreigners, of property belonging to citizens or subjects of the belligerents. In all these cases, salvage is due where it would be due in cases of recapture. In cases of derelict by the enemy after capture, the salvors are also entitled to salvage upon restitution; and in like manner upon donations made by the enemy before condemnation, where the donees have brought the property into port, and it is restored (as it ought to be) to the original owner. Where a hostile ship is captured, and is afterwards recaptured by the enemy, and then is recaptured again from the enemy, the original captors are not entitled to restitution upon payment of salvage; for all their rights were devested by the first recapture. The same rule applies where the original captors have voluntarily abandoned their prize, but not where the abandonment has been involuntary, and occasioned by the terror of a superior force of the enemy. In all cases where the amount of salvage is not expressly provided for by law in cases of recapture, the power of courts of prize to award it is discretionary.

XII. Connected with the subject of recapture, that of ransom may properly find a place. It has been already stated that, during war, all intercourse, and right of making contracts, are suspended between belligerents, as interdicted by the law of nations. But an exception has been uniformly recognised in the practice of nations as to contracts of ransom. This contract arises when the enemy, having made capture of a prize, consents to restore it, upon receiving a suitable compensation; and the contract so entered into between the parties is, upon principles of public faith and policy, held valid. It is usual, in such cases, to retain the master, or some of the officers of the prize, as hostages for the strict fulfilment of the contract. The death or escape of the hostages, they being merely security, does not discharge the contract. And although, upon strict principles of law, it has been thought, by the British courts, that actions upon ransom bills cannot be brought against the owners (who, as well as the hostages and master, are bound by the contract) during the war, yet it seems difficult upon principle to perceive why a court of prize might not properly enforce it as a contract of prize excepted from the general rule of hostilities. The effect of a ransom is, that it amounts to a virtual safe-conduct to the vessel and cargo during the remainder of the voyage, so as to prevent the property from a second capture by another belligerent cruiser of the same nation. If it were otherwise, the ransom contract would scarcely be entered into; and, since the validity of the contract is conceded, there is an implied consent on the part of the sovereign of the captors, that it shall be a protection from subsequent capture during the voyage. If the prize, however, deviates from the voyage, she forfeits the protection, and will be liable again to capture. And if she is lost during the voyage, the ransom contract is still obligatory upon the parties; for it is not on the part of the captors a contract for the risk, unless they expressly so engage, but a simple surrender of their own rights acquired by capture. If the prize be a neutral, still, if the capture is not utterly wrongful, but founded upon justifiable cause of capture, such as breach of blockade, carrying contraband, or other violation of neutral duties, or even if it is upon probable cause of capture, and sending in for adjudication, a ransom bill given by the neutral for a release is good, and will be enforced in the tribunals of the neutral country. But suppose, after the ransom bill is taken, the capturing ship, together with the bill, is captured, what becomes of the ransom bill, and to whom does it belong? The answer is, that the ransom bill is a part of the capture, and the debtors upon it are thus discharged from all claims by the enemy upon it. But it does not necessarily follow, that the recaptors, succeeding to the rights of the ransom-holders, might not be entitled to salvage for the benefit rendered to the debtors upon the ransom bill. Pothier says (*De Propriété*, n. 139, p. 10[illegible]) that, in cases of deviation after the ransom, if a second capture takes place, the ransom holders are entitled to the amount out of the proceeds of the prize, and the second captors can only take the residue. And, under such circumstances, he deems the debtors on the ransom bill discharged from their obligation. His reasoning does not seem very satisfactory. In England, ransom bills are prohibited, and declared by statute to be void, unless in cases of extreme necessity, to be allowed by the court of admiralty. In America, no statute regulations exist; and, therefore, the doctrine stands on the general law of nations.

XIII. Joint captures. Captures may be made by a single vessel, or by an associated force acting together by preconcert, or accidentally co-operating, or by a detached ship belonging to a squadron, by privateers, or by public ships of war, by naval forces alone, or by the conjoint operation of land and naval forces. 1. In relation to public ships, the general rule is, that all public ships in sight at the time of the capture are deemed to be assisting, and are, therefore, entitled to share in the capture. It is otherwise in relation to privateers, for their being in sight is not sufficient, unless they are purposely and previously associated together; but there must be actual intimidation, and actual or constructive assistance. The reason of this distinction is, that public ships are under a constant obligation to attack the enemy; and, therefore, from the mere circumstance of their being in sight, a presumption arises that they have an intention to capture. But, in the case of privateers, no such obligation exists; and the law does not, therefore, give them the benefit of a like presumption. Besides, in cases of public ships, the rule ensures harmony in the service; and in favour of public ships, the rule prevails even when the actual capture is made by a privateer. There are exceptions, however, to the rule, even in relation to public ships, where the circumstances of the case repel the presumption of constructive assistance. Thus, if the public ship be pursuing a course inconsistent with any notion of capture, or if she have given up the chase, or otherwise abandoned all intention of co-operation or pursuit, the claim of joint capture will be repelled. But, even in cases of public ships, the rule of being in sight is strictly construed. The ship must, at the time of capture, be actually in sight; it is not sufficient that she has been so the day before: she must also be in sight at the commencement of the engagement, or chase, or during its continuance. A convoying ship, notwithstanding her special employment, may be entitled to share as joint captor, if, by chase or intimidation, she aids in a capture, without interfering with convoy duty. In captures made by boats, it is a general rule that the ships to which they belong are entitled to share. In respect to public ships associated in the same service, or engaged in a joint enterprise, the general rule is, that they are entitled to share in each other's prizes made while in such service or enterprise. Thus, where a fleet is engaged in a blockade, the service is considered as joint, and all the fleet are entitled to share in captures made by any one of the ships. But it will be otherwise as to vessels previously detached upon a separate service, or to captures made in another service, for which they were not associated. In regard to conjunct operations by land and naval forces, how far captures made by the latter are to be shared by the former, depends upon circumstances. A mere general co-operation for the same general objects is not sufficient. But an actual co-operation is clearly sufficient. So an ally co-operating by land or sea in a capture is entitled to share in it. In respect to joint captures by public ships, the rule, as to the proportion in which they are to share, is generally settled by statute. In the United States of America, it is provided by an act of congress, that capturing ships shall share according to the number of men and guns on board each ship in sight. In respect to joint captures by privateers, no statute regulations exist; and the general rule of the prize law, in such cases, is, that they are to share in proportion to their relative strength. In Great Britain and the United States of America, this relative strength is measured by the number of men on board assisting in the capture. The rule is the same where an ally co-operates in the capture, and in cases of joint capture by a public ship and a private ship, whether commissioned or not.

XIV. The effects of a suspension of hostilities, and a treaty of peace. An armistice, truce, or other suspension of hostilities, is binding between the parties from its date; and all captures made subsequently thereto must be restored by the sovereign. But the actual captors, if they have no notice, are not to be deemed guilty of a wrongful act to the extent of being liable for vindictive costs and damages, at least, if they have not been guilty of gross misconduct or wilful negligence. There may, indeed, be special cases in which ignorance of a treaty of peace, or of a suspension of hostilities, either generally or in particular places, might not excuse a party from responsibility for a capture, or other wrongs done to the injured party, and in which the sovereign would be bound to indemnify him. But such cases are rare, and are governed by their own circumstances. To avoid inconveniences of this sort, it is customary to fix certain distant periods at which hostilities shall cease in different places, so that all parties may have suitable opportunities of notice. In cases where such stipulated periods are fixed, subsequent captures are deemed utterly invalid. But as to captures antecedently made, especially after notice of the existence of the peace, some diversity of opinion exists among writers on public law. The better opinion, however, seems to be, that if the treaty does not otherwise provide, the rule of *uti possidetis* prevails. A treaty of peace has the effect of quieting all titles of possession acquired during the war, unless a different stipulation is made. It therefore operates as conclusively between the belligerents as the most formal sentence of condemnation. And whatever defect may exist in the title, the infirmity is cured, or at least it can no longer be insisted on. And neutrals, who have acquired property from belligerents, under defective titles, have a right to avail themselves of this confirmatory operation, by a treaty of peace. Whatever rights existed antecedent to hostilities between the subjects of the belligerents, if no confiscation or action upon them has taken place during the war, are revived, and may be pursued and claimed, upon the return of peace.

XV. Such is a brief outline of some of the more important principles of prize law, applicable to maritime captures. A full examination of all of them, in their details, could be made only in a large and voluminous treatise. This sketch will be closed by a summary of some of the principles which regulate the general practice of the English and American courts of prize. 1. As soon as the captured ship arrives in port, the prize-master is bound to give notice thereof to the proper court of prize, and to deliver, upon oath, into the registry of the court, all the papers found on board of the ship. It is the duty of the captors to send in, with the ship, the master or some of the principal officers and crew of the ship, in order that their testimony may be taken, upon standing interrogatories, which are prepared under the direction of the prize court. The prize-master accordingly gives notice to the commissioners appointed to take the examinations of the master and crew of the captured ship, so brought in, upon these interrogatories; and these examinations are made immediately after the arrival in port; and in order to prevent frauds and concealments, the witnesses, before examination, are not allowed to have any communication with, or to be instructed by, counsel. Each witness is separately examined, and his answers written down, and the whole are then subscribed by him, and verified by the commissioners, and then certified, under seal, to the prize court. These examinations being completed, a libel is filed in the prize court, alleging the facts in the most general form, and asserting the property to belong to enemies; and a monition is thereupon issued and duly published, requiring all persons who have any interest or claim to appear, at a given day, in court, and show cause why the ship and goods should not be condemned as prize. This is the American practice, which differs, in the order of the proceedings, from the English, the latter issuing the monition before the filing of the libel. 2. Upon the return of the monition, the parties who have any interest, and mean to assert any claim, appear and put in their claim, under oath; and as soon as such claim is put in, the cause is ripe for a hearing. If the ship or any part of the cargo is neutral, the master usually puts in a claim in behalf of the owners, or it is put in by the consul of his nation, or by the accredited correspondents or agents of the claimant. If the captors have been guilty of any delay in instituting proceedings, the claimant may procure a monition from the court, requiring them to proceed to adjudication. If no claim is put in on the return day of the process, the default is entered on the records; but it is not now usual to proceed to a final decree of condemnation until a year and a day after the return of the monition, except in cases where, from the evidence, there is a strong presumption that the property belongs to the enemy. But after a year and a day, condemnation goes of course, unless a claim is interposed. 3. No claim is permitted to be put in, unless by the master or correspondent, or agent of the owner, or by the consul of the nation. A mere stranger, having no interest, is not permitted to claim. It has been already stated, that a claimant in a prize court must be the general owner of the property. If he has but a lien, or is a mere insurer, or a mortgagee not in possession, he cannot maintain any claim, for reasons which are founded in the incompetency of such a court satisfactorily to investigate such claims. There are certain other cases, in which claims will not be allowed to be interposed, but are rejected as incompetent: thus no claim is admitted which stands in direct opposition to the ship's papers and documents on board, and preparatory examinations, at least after the war has commenced; no person is permitted to claim, where the transaction is in violation of the municipal laws of his own country; nor in a case where the trade is prohibited by the law of nations, or the law of nature; or is a gross violation of his duties as a belligerent; in all such cases the claimant is held not to have a *persona standi in judicio;* and, his claim being rejected, the cause stands as if there were no claim at all interposed. The ship's papers, and examinations upon the standing interrogatories, are never allowed to be seen until after the claim is filed, so that the party may not have an opportunity to frame it to meet the exigency of the evidence. 4. Supposing the claim to be interposed by a competent party, and in a valid manner, the cause is then to be heard. The hearing is, in the first instance, confined altogether to the ship's papers and documents on board, and the preparatory examinations taken upon the standing interrogatories. No extrinsic evidence is admitted on either side; for it is a general rule of the prize courts, that the evidence to acquit or condemn must, in the first instance, come from the papers and parties found on board. 5. If, upon the hearing, a case for condemnation or acquittal is satisfactorily made out, the court will at once proceed to make the proper decree. But if the case be doubtful, and the evidence unsatisfactory, then it becomes a case for further proof. The captors are rarely allowed, unless under special circumstances, to make further proof; but the claimant is allowed to make further proof unless he has forfeited this privilege by his own misconduct, or that of his agents, or the posture of the case shows that he cannot safely be trusted with further proof. The claim to make further proof is a matter not of strict right, but of sound discretion in the court. It is usually allowed where the party has acted with good faith and propriety; it is always denied where he is guilty of gross misconduct or fraud. If further proof is denied in a case which requires it, the result is, that a decree of condemnation follows; for the burden of showing that the property is not good prize rests on the claimant. And where further proof is allowed, it is usually made by affidavits and testimony taken under commission; and if then it proves still unsatisfactory, it is deemed conclusive evidence that the property is hostile, or that there has been some misconduct, which justifies condemnation. Further proof is never allowed where there are false or colourable papers on board; or where any papers are thrown overboard; or where there has been a spoliation of papers; or where there has been a covering and concealment of enemy interests; or where the master and crew, upon the preparatory examinations, have been guilty of gross prevarication or falsehood; or where there is a false destination; or where there is a want of good faith in the claimant; or where the case appears to be incapable of any fair explanation. 6. During the pendency of the proceedings, which are sometimes protracted to a great length of time, owing to accidental circumstances, an unloading of the cargo often becomes necessary. This may be procured upon a suitable application to the court, for the court has a virtual custody and possession of the property from the moment of the proceedings in rem being commenced. If the property be perishable, the court has also authority to decree a sale of it, upon the application of either party; and it often proceeds to direct a sale upon the consent of both parties, where the property is not perishable. And where a sale has been made, the proceeds are subject to the order of the court, as a substituted fund for the original property; and if not brought into court, they may, in the discretion of the court, be ordered to be deposited in the registry. In cases of the capture of neutrals, application is often made for a delivery of the property upon bail, or security by way of stipulation for the value; and when it is given, the bail becomes a substitute for the property, and is subject, in the same manner, to the orders of the court: but no such delivery will be made, according to the practice of the prize court, until after a hearing of the cause, unless upon the consent of both parties. If, upon the hearing, the case is one for further proof, and the neutral has disabled himself from producing it by his own misconduct, the court is then in the habit of allowing a delivery of the property to the claimant, upon an appraisement, and giving bail. And if the claimant will not take it, it is sometimes delivered, upon an appraisement and bail, to the captors. 7. After the cause has been finally heard, a decree is entered either of acquittal or condemnation, of the whole or of part. A decree of acquittal will be with or without damages and costs to the claimant, according to circumstances. If there was probable cause of capture (as has been already stated,) no damages or costs will be given to the claimant; but costs and expenses are usually, in such cases, decreed to the captors. If the capture is without probable cause, costs and damages to the claimant usually follow. If a decree of condemnation is pronounced, the claimant is made responsible for the expenses and costs of the captors by reason of the claim. 8. A decree of condemnation being pronounced, it often remains a question to whom the condemnation is to be, whether to the government or to the captors. In cases of captures by public ships, or by non-commissioned vessels, the decree of condemnation is to the government generally. In cases of captures by privateers duly commissioned, the condemnation is to the captors. In England, the lord high admiral is, in certain cases, entitled to the proceeds of captured property, which are called *droits of admiralty*. But in modern times, this office is usually held by the king, or for his benefit, and therefore the distinction is, for the most part, now nominal. In the United States, no such distinction exists. It is no objection to proceeding to a decree, that any of the parties have died; for, the proceedings being *in rem*, they are not interrupted by such occurrences. Time, however, is usually allowed for the legal representatives of a deceased claimant to appear, if there is any necessity; and in proceedings *in personam*, a monition always issues to the legal representatives, if any, before a decree. 9. A decree of condemnation is usually pronounced by an interlocutory, in the nature of a final decree. But the case rarely ends here; for the prize court, as an incident to the possession of the principal cause, may, and usually does, in cases of controversy, upon the application of any party in interest, proceed to decree distribution of the proceeds. If the proceeds are not in court, it also acts against prize agents and others having possession of the proceeds of prize, or bound to respond for them, by way of monition, and orders them to be brought into the registry for distribution. Such is a summary sketch of some of the most important principles of prize law and prize practice. It is necessarily imperfect, for a full discussion of these subjects would be incompatible with the design of a work of this nature.

PROBABILISTS; those philosophers who maintain that certainty is impossible, and that we must be satisfied with what is probable. This was the doctrine of the new academy, particularly of Arcesilaus and Carneades. In morals, probabilists are those who teach that, in our actions, we must follow what seems to us most probably right; because, in questions of morality, demonstrative certainty is not to be attained. Among the Jesuits, there were some who taught that a man may follow what is probably right, or what has been decided to be so by teachers of authority, although it may not be the most probably right, or may not seem probable to himself. See *Jesuits*.

PROBABILITY. In the doctrine of chances, the probability of any event is the ratio of the favourable cases to all the possible cases, which, in our judgment, are similarly circumstanced, with regard to their happening or failing; and it is greater or less according to the number of chances by which it may happen, compared with the whole number of chances by which it may either happen or fail. The calculation of chances in games of hazard, and the theory of insurance, whether of property or life, are founded on the laws of probability, as developed by mathematical analysis. The doctrine of probabilities forms of itself a science, embracing a vast number of complicated and delicate questions. The subject is treated of in Bernoulli's *Ars Conjectarandi*, Condorcet's *Essai sur la Probabilité des Decisions*, Lacroix's *Traité*, Laplace's *Essai philosophique sur les Probabilités*, and *Traité analytique*, and in other works by Price, Halley, Simpson, &c.

PROBATE COURTS. See *Courts*.

PROCESS, FORMS OF THE CIVIL. Momentous as this subject is, it has not received its due share of attention from philosophical minds, compared with that bestowed on numerous other branches of jurisprudence; few of which deserve more serious consideration, though many may be more attractive. As to the history of the civil process, so important a test of the political condition of a society, the work of Mr Meyer, *Esprit, Origine et Progrès des Institutions judiciaires des principaux Pays de l'Europe* (6 vols. 1820—23), has by no means exhausted the subject. The four most important forms of civil process or civil procedure now existing, are the English, French, the common German, and Prussian. I. The English is so well known to most of our readers, that we need not enter into the details of it here. (See the articles *Courts*, *Jury*, *Evidence*, *Assizes*, &c.) The general principle is, that the court takes no further part in the course of the proceedings, than to see that the law is observed, and that nothing unfair is done by either party, &c.; but it has nothing to do with the investigation of the truths in the pending case. This is left to the parties, or the skill of their counsellors. This, the oldest of the above four forms of procedure, is the opposite of the Prussian, the most recent.

II. The French system is founded on the procedure of the spiritual courts, with the application of the Roman law: it has been formed since the fourteenth century by the usage of the parliaments, particularly that of Paris (*style du parlement*), and by several royal ordinances, among which, that of 1539 is distinguished. (See Bernardi, *De l'Origine et des Progrès de la Législation Française*, 1816.) Louis XIV. caused a regular form of procedure to be issued in 1667, of which the most recent, that of Napoleon, in 1806, is but a modification. The oral statement of the parties in open court, is the chief point in this system. The introductory proceedings, the setting forth of the complaint, the answer, rejoinder, &c., go on entirely without the interference of the court, by means of a correspondence between the attorneys. The real points of the case are not fairly brought out in this stage of the proceedings, and it would seem, therefore, that the whole process fails of its first requisite, a firm basis: the position and claims of the parties remain changeable and indefinite until the sentence. Nay, the true cause of action is not fully stated (*prendre ses conclusions*) till the last audience, when the sentence is given. Incidental questions must be decided before the parties can proceed, by which great delay is caused, though much pains have been taken to shorten the process in this respect. The uncertainty caused by the want of precision in the preparatory proceedings is in a degree avoided by two circumstances, which are extremely beneficial; 1st, The right of a party to demand, in any stage of the process, precise statements respecting particular alleged facts from the opposite party (*interrogatoire sur faits et articles*), which are not given on oath, indeed, but under strict obligations to veracity; and, 2d, the right of the judge to order the parties to appear in court, that he may question them himself respecting the facts. The second chief part of the process, the mode of proof, is, like every order emanating from the court, introduced by an interlocutory judgment, against which the common legal remedies are admissible; and, lastly, the third part, The arguments of the advocate are presented orally in open court. In civil cases, as is well known, there is no jury in France.

III. Since the reforms of the sixteenth century, and particularly the last decree of the diet of 1654, the German (excepting the Prussian) process is chiefly characterized by the cautious and complete statement of the cause of action; the obligation of the defendant to answer thereon immediately and fully, bringing together all his objections; and the skill with which the examinations of the evidence are conducted. The judge is bound to see that the written statement of the plaintiff's cause of action possesses the necessary qualities to make a safe basis for the whole of the future proceedings: but this is a duty which he can fulfil but in an imperfect manner. The great disadvantages accruing to the parties themselves, from an imperfect exposition of the cause of action, are the strong motives which induce the greatest caution in drawing up these statements. Yet the most skilful lawyer is not always able to avoid the dangers to which he is exposed; and as, in Germany, the practice of the law is, generally speaking, the preparatory step to public office, and as very few men of talent remain permanently in the profession, which stands in a very subordinate relation to the court, it is easy to perceive what injury is done to the parties by inexperienced, incompetent counsel. The great art is, to say as little as possible, to admit as little as possible; and an honest, plain exposition by the parties is, of course, very rare. The proof can be attempted but once. A failure is irremediable. Often, therefore, a party with a good cause of action fails, after a tedious process and great expense, and is obliged to begin his cause anew; and it often happens, that a well founded claim is lost for ever, by an attempted proof badly conducted. (The right of parties to produce better proofs, after having presented insufficient ones, is to be found as yet in but few systems of civil procedure.) The third part of the process, also, viz. the arguments of the counsel, are in writing; and, as they are only intended for the judge, little care is generally bestowed upon their style of execution, except in some of the higher courts.

IV. In order to prevent these evils, and to exclude as much as possible the arts of advocates, the Prussian process returns to the ancient provisions, found in the Roman and canon law, and retained in the French system of procedure, which require the judge himself to examine the parties respecting the facts; and it has even gone one step farther. Its foundation was laid as early as the system of procedure of the high-chancellor Cocceji, 1748; and the reform of Carmer, in 1780, fully established the rule, that the judge himself should hear the allegations of the parties against each other, bring the points of dispute into a connected form (and, if the parties wish it, himself write down the complaint and answer), then collect the proofs respecting the essential facts, and, particularly, hear the witnesses himself. Hence arises the important consequence, that each party can constantly complete and correct his own statements, and is not obliged to bring together, with anxious care, in the beginning of the action, every thing which may become necessary, nor to weigh every word in a balance. No complaint can be rejected merely for informality or mistake in regard to the legal mode of bringing the action, because such defects can be remedied by order of the judge. Hence the conduct of a cause requires, in general, incomparably less time and exertion than in the common German process, and that of France, because interlocutory judgments do not take place; and the whole course of the cause is directed by decrees. The greatest advantage, however, is considered to be the little influence of mere forms, and the paramount importance which is always given to the truth. The third part of the process has nothing peculiar, as here, also, only arguments in writing take place. The remarkable character with which the Prussian judge is thus invested, has been censured by a number of the first jurists in Germany. We have not space to show the advantages of the system; the Prussians themselves are attached to it, and consider justice as strictly administered in their country. The last part of the Prussian process and the final sentence have been considered, even in Prussia, the most objectionable part of the system, and might, perhaps, be remedied by substituting for them oral public proceedings. To a free country, always more or less subject to party excitement, such a system could hardly be adapted. A curious consequence of the Prussian process is, that the career of the lawyer begins by being attached to a court, where he works under the superintendence of the judges, hears witnesses, draws up a statement of the circumstances, and afterwards becomes a judge, or some other officer of government, or one of the counsellors, the number of whom is limited in each court.

PROCESSION, in the Roman Catholic church; a solemn march of the clergy and people, attended with religious ceremonies, prayers, singing, &c., around the altars and churches, or in the streets for the purpose of returning thanks for some divine blessing, or averting some calamity, &c. (See *Pilgrimage.*) Processions, as a part of the symbolic worship of nature, were in use among the ancient heathens; thus they formed solemn processions about the fields, which had been sowed, and sprinkled them with holy water to increase their fertility, and to defend them from injuries. The festivals in honour of Bacchus, Ceres, Diana, and other divinities, among the Greeks and Romans, were solemnized with processions, in which the images of the gods were borne about; and similar rites are still found among most heathens. (See *Juggernaut.*) They appear to have been introduced into the Christian church in the time of St Ambrose, bishop of Milan, in the fourth century. In Protestant countries, processions, as well as pilgrimages, have ceased.

PROCESSION OF THE HOLY GHOST. See *Creed*, and *Ghost, Holy*.

PROCIDA, GIOVANNI DI. See *Sicilian Vespers*.

PROCONSUL AND PROPRETOR. The administration of the Roman provinces was originally intrusted to pretors, but at a later period, to proconsuls and propretors, with their assistants, the questors and legates. The consul and pretor received the name, the former of *proconsul*, the latter of *propretor*, at the expiration of their offices, when they went into the provinces, as governors. After the Roman empire had been extended over many countries, it was provided by a law of C. Sempronius Gracchus, that, at the consular and pretorial elections, the senate should distribute the provinces into *provincias consulares*, and six *prætorias*, for which the consuls and pretors should cast lots or divide them among themselves by agreement, a few days after their entrance upon office, after the expiration of the term of which, they became the governors of the provinces allotted to them. The duties of these provincial magistrates were the administration of justice, the supervision of other affairs of the province, and the command of the troops which were stationed in it. The term of office was usually a year, sometimes two, and rarely three or more. Within thirty days after his return to Rome, the provincial governor was bound to make a report of the acts of his government and of the state of the province. If he had permitted any acts of injustice or oppression, he could be impeached therefor; as for extortion (*repetundarum*), peculation or embezzlement of the public money (*peculatus*), or for abuses in regard to the army (*crimen majestatis*.) Notwithstanding these precautions, the provinces were subjected to various oppressions and exactions. See *Province*.

PROCOPIUS, OF CÆSAREA; a Greek historian, a native of Cæsarea, in Palestine; imperial counsellor of Anastasius, also of Justin and Justinian, and secretary to Belisarius, whom he attended in his expeditions, of which he wrote the history; a senator and prefect of Constantinople, where he is supposed to have died, about 560. His works are, a History of his Own Times, in eight books, the first two relating to the Persian war, the two following to the war with the Vandals, and the remaining four to the Gothic war; and a History of the Edifices built or repaired by Justinian. A kind of scandalous chronicle of the court of Justinian, including a most degrading account of the personal history of the emperor, the empress Theodora, and many other individuals, and entitled *Anecdota*, has been attributed to him by some writers. His works were published at Paris (1662, folio.)

PROCRIS; daughter of Erechtheus and wife of Cephalus. (q. v.)

PROCRUSTES; a celebrated robber of Attica, who had two bedsteads, one short and the other long. The monster placed his short guests in the long bed, and then, under pretence of fitting the bed to the occupant, stretched the latter till he died. If his guest was tall, Procrustes placed him in the short bed, and reduced him to the proper dimensions by cutting and clipping. Theseus finally served him as he had served others.

PROCTOR (from *procurator*), in the doctors' commons. (See *College of Civilians*.) In the English universities the *proctors* are two officers chosen from among the masters of arts, to superintend the scholastic exercises, to enforce the statutes, and to preserve the public peace.

PROCURATOR, among the Romans; an agent, an overseer of an estate; at a later period, the title of a provincial officer, inferior to the governor (see *Province*, and *Proconsul*), who managed the revenue. In some of the small provinces, or in a part of a large province, the procurator discharged the office of a governor, and had the power of punishing capitally, as was the case with Pontius Pilate, in Judæa, which was attached to the province of Syria. In the civil law, the *procurator*, or *proctor*, answers to the *attorney* in the common law. (See *Advocate of the Crown*.)

Procurator, or *proctor*, in monasteries, is the conventual, to whom is intrusted the care of the temporal concerns.

Procurator di San Marco was the title of the chief officers or senators in the Venetian republic. Besides the nine actual *procuratori*, from among whom the doge was chosen, there were also many titular procurators, who paid a great sum for this title, which was much coveted by the Venetian patricians on account of the rank it conferred.

PROCUREUR GENERAL, PROCUREUR DU ROI. See *Advocate of the Crown*.

PRODICUS. See *Sophists*.

PRODUCTION. See *Political Economy*.

PRŒTUS; in fabulous history, twin brother of Acrisius, king of Argos. They quarrelled with each other in their mother's womb. Acrisius banished Prœtus from Argos. He fled to Jobates or Amphianax, king of Lycia, married his sister, and, by his aid, conquered the city of Tirynthus, and founded a small kingdom. Here Bellerophon (q. v.) took refuge with him. His daughters, the Prœtidæ, wandered about through Argolis and Arcadia, having become mad, either on account of their contempt of the mysteries of Bacchus, or of their derision of the statue of Juno. According to later traditions, they imagined themselves cows, and wandered through the fields with wild lowings; the same frenzy seized the other women of Argos also. Melampus cured them, and received a part of the kingdom. Perseus changed Prœtus into stone, by showing him the head of Medusa.

PROFANE; an epithet applied, in ancient times, to uninitiated persons who were not allowed to be present at the sacred services, particularly those of Ceres and Bacchus, but were obliged to remain outside of the temple. The Romans used the word in a wider sense, applying it to the vicious, in general. When every thing was prepared for the sacrifice, the priest exclaimed, *Profani sacris exeste*. The word was afterwards used by Christians in contradistinction from *sacred*, as *profane* literature. It was also applied to persons who treat sacred things with irreverence.

PROFESSED. See *Jesuits*.

PROFESSION; the act of taking the vows by the member of a religious order, after the novitiate is finished. See *Monastic Vows*.

PROFILE; in general, the view of an object from one of its chief sides, at which more or less of the other side is hidden from the eye; in particular, the contour of the human face, viewed from one side. The traits of character are often expressed with peculiar strength in the profile. A face which, when seen directly in front, attracts us by its rounded outline, blooming colour, and lovely smile, is often divested of its charm, when seen in profile and strikes only as far as it has an intellectual expression. On the other hand, it is often the eye alone which expresses the character strongly. It requires practice to judge accurately in viewing a profile, in which the marked often strikes too strongly, the soft too slightly. Only where great symmetry exists, connected with the preponderance of the intellectual over the sensual, will the profile appear finer than the front face. In the profile the facial angle appears. (See *Facial Angle*.) It is comparatively easy for the artist to draw a likeness in profile, yet he must be careful not to exaggerate the peculiar traits, lest he approach caricature, nor to weaken them, lest he detract from the expression of the face. As the profile indicates more particularly the intellectual character of man, it is natural that in children it should be insignificant. In 1818, professor Blumenbach received, from the present king of Bavaria, a skull of an ancient Greek, found in a tomb of Magna Græcia. It may be considered as a model of the antique Greek profile, in respect of beautiful form. The nose is connected in a straight line with the forehead, and thus would contradict the theory recently started, that the profile, exhibited in works of ancient Greek art, was not an imitation of nature, but, as De Pauw asserts, merely a style adopted arbitrarily in various schools. In the case of buildings, mountains, &c., the outline, viewed from one side, is also called the *profile*. In regard to the profile of a mountain, which is a subject of much importance to the engineer, we may remark, that every mountain admits three different views; one, from the summit or one of the declivities; another, from the opposite declivity; and a third, from the adjacent country, when it is seen in profile. The last view is the best for obtaining a correct estimate of the angle of declivity, and representing it in a plan. The profile of a mountain is of importance to the architect, the farmer, and to the soldier, in the building of roads and aqueducts, in the cultivation of the soil, in the march, and especially in the disposition of troops, particularly of artillery, which is more or less difficult according to the greater or less steepness of a country. In architecture, the importance of the profile of heights has been long understood; but, in the military art, it was first fully understood in modern times, that a correct view of the country is of the greatest importance, alike to the artillerist, the engineer, and the general officer; and much precision has been obtained, by taking the horizontal level, shown by standing water, as a basis, by a comparison with which, or with its parallels, the angle of every declivity must be determined. Small differences are generally neglected, and the declivity marked only in divisions of five degrees. Major Lehmann, who has highly distinguished himself by his labours in this branch, has gone still further; he has invented a projection, so that what could formerly only be represented by drawing the profile of a mountain, viz. the angle of the declivity, and the kind of troops it will allow to act, is rendered immediately evident by a projection, in which the observer is supposed to be stationed perpendicularly over the object represented. He obtains this end by making the lines, which represent the declivity of a mountain on a plan, blacker and closer together, if the declivity is great, and finer and farther apart, if it is slight. Total white represents a perfect plain; total black a declivity of 45°, as the steepest that can be met with, unless it be a wall of rock, and consequently impassable; fine widely separated lines indicate a slope of 5°; broader and closer lines one of 10°; still closer lines one of 15°, and so on for every 5°, to 45°. The whole is founded on mathematical principles, and on the fact, that, to an observer, the declivity in a landscape will appear shaded in proportion to its inclination, while a level plain will appear in the strongest light, without shade. Plans projected in this manner are of the greatest service in the field, because they appear to a practised eye like a perfect picture. It is even possible to draw the profile of a mountain from a plan well executed in Lehmann's manner.

PROGNE, PROCNE. See *Philomela*.

PROGNOSIS; the foretelling the event of diseases from particular symptoms. Those symptoms which enable the physician to form his judgment of the cause or event of a disease are called *prognostics*.

PROGRESSION, in arithmetic and algebra; a series of numbers advancing or proceeding in the same manner, or according to a certain law, &c. Progression is either arithmetical or geometrical.—*Arithmetical progression* is a series of three or more quantities that have all the same common difference; as 3, 5, 7, &c., which have the common difference 2.—*Geometrical progression* is a series increasing by a common multiplicator, so that each term contains the preceding a certain number of times.

PROHIBITIVE SYSTEM. See *Political Economy*.

PROJECTILE; a heavy body, which being put in motion by an external force impressed upon it, is dismissed from the agent and left to pursue its course; examples of projectiles are a stone thrown from the hand, a bullet from a gun, &c. The theory of the motion of projectiles is a part of higher mechanics, and is of great importance in the science of gunnery. Bodies may be projected perpendicularly, horizontally, or obliquely, and are acted upon both by the force of projection and the force of gravity; the path which they describe must therefore depend upon the ratio of these forces. Besides these two elements, a third is presented by the resistance of the medium (as, for instance, the air) through which the projectile is driven. When the direction of the projecting force is perpendicular, the path of the projectile is a right line; if it be downward, the motion is accelerated by the force of gravity; if upward, it is retarded, and finally annihilated, and the body then falls by its mere gravity. But in the case of horizontal or oblique projection, when the direction of the projecting force and that of the force of gravity form an angle with each other, the result is a curvilinear motion; and, according to the laws of falling bodies, discovered by Galileo, the path of the projectile, setting aside the resistance of the air, is a parabola. The principles deduced from the laws of Galileo constitute the theory of the parabolic motion of projectiles, in which they are considered as moving in a non-resisting medium. The problem to determine the effect of the resistance of the air is, however, of great practical importance, and was first solved by Tempelhof in his *Bombardier Prussien*. See the articles *Mechanics*, and *Parabola*.

PROJECTION, in perspective, denotes the appearance or representation of an object on the perspective plane. See *Perspective*.

PROJECTION OF THE SPHERE IN PLANO is a representation of the several points or places of the surface of the sphere, and of the circles described upon it, according to the places which they images occupy, upon a transparent plane placed between the eye and the sphere, or such as they appear to the eye placed at a given distance. The principal use of the projection of the sphere is in the construction of planispheres, maps, and charts, which are said to be of this or that projection, according to the several situations of the eye and the perspective plane, with regard to the meridians, parallels, and other points or places so represented. The most usual projection of maps of the world is that on the plane of the meridian, which exhibits a right sphere, the first meridian being the horizon. The next is that on the plane of the equator, which has the pole in the centre, and the meridians the radii of a circle, &c. The projection of the sphere is usually divided into orthographic and stereographic, to which may be added gnomonical. *Orthographic projection* is that in which the surface of the sphere is drawn upon a plane cutting it in the middle; the eye being placed at an infinite distance vertically to one of the hemispheres. *Stereographic projection of the sphere* is that in which the surface and circles of the sphere are drawn upon the plane of a great circle, the eye being in the pole of that circle. *Gnomonical projection of the sphere* is that in which the surface of the sphere is drawn upon an external plane commonly touching it, the eye being at the centre of the sphere.

PROLEGOMENA (*Greek*); preliminary observations, serving as an introduction to a work, to which they are prefixed, and containing historical, critical, &c. illustrations of its contents, language, form, &c.

PROLOGUE, in dramatic poetry; an address to the audience, which precedes the piece itself, that is, the proper action. It may be either in prose or verse, and is usually pronounced by one person. Among the ancients, the player who delivered this address was called the *prologus*, and was usually considered as a person of the drama. Thus in the *Amphitryon* of Plautus, Mercury appears as *prologus*. Prologues sometimes relate to the drama itself, and serve to explain to the audience some circumstances of the action, sometimes to the situation in which the author or actor stands to the public, and sometimes have no immediate connexion with either of these persons or subjects. See *Epilogue*.

PROMETHEUS, a Titan, son of Japetus and Clymene, a daughter of Oceanus; Æschylus makes Themis, Apollodorus Asia, his mother. He was the father of Deucalion. Cunning and fertile in expedients, he opposed Jupiter, the founder of the new race of the gods, whom he had at first supported; and when some of the Titans proposed to expel Saturn from the throne, and elevate Jupiter in his place, Prometheus advised them to work by cunning, as it had been revealed to him by Themis and Earth, that cunning, and not force, would be victorious. But they neglected his advice, and Prometheus went over to the side of Jupiter, who became victorious through his counsels. Jupiter, who despised poor mortals, determined to extirpate them, and create a new race. But Prometheus prevented him, by secretly bestowing on men the fire which had been concealed by Jove, and teaching them the arts. To punish this offence, Jupiter sent down Pandora, who brought all kinds of diseases into the world. He caused Prometheus himself to be chained by Vulcan on a rock of the Caucasus (the eastern extremity of the world, according to the notions of the earlier Greeks), where his liver, which was renewed every night, was torn by a vulture or an eagle. But Prometheus, knowing that from Io's race would spring a man (Hercules), who, after having encountered innumerable hardships, would deliver him from his chains, suffered with heroic firmness; he was even acquainted with the future fate of Jove, which was unknown to the god himself. When the irresistible enemy of Jupiter, generated by himself and Thetis, should appear, then Prometheus was to find a termination of his sufferings. Jupiter must then be reconciled to him, because his fall could only be prevented by the counsels of Prometheus. These are evidently two traditions united by Æschylus. The cause of Jupiter's anger against mortals, and determination to destroy them, is thus related by Hesiod. The gods once attempted to make an agreement with men at Mecone, the object of which was to determine what honours the gods should enjoy, and what duties men should owe them for their protection. Prometheus appeared for men, that the gods might not impose too burdensome duties upon them, in return for their protection. A bull was brought as an offering, from which the gods were to select what portion they chose for their share. After it was cut up, Prometheus formed two heaps; in the one he placed the flesh and the fat entrails, wrapped in the skin of the bull, and covered with the stomach; in the other pile he placed the bones, artfully concealed in the fat. Jupiter, who did not see through the trick, chose for the gods, and selected the fat, in which he was indignant to find only the bones. Hesiod adds, that from that time it became the custom to offer to the gods bones without flesh. In Lucian's dialogue, called *Prometheus*, Prometheus is accused not only of this division of the flesh, and of stealing the fire, but also of having created man. According to Apollodorus, he formed man of clay and water, and bestowed on him fire, by kindling dry wood at the sun. Plato relates that the gods had made the races of animals from earth and fire, but that they left to Prometheus and his brother, Epimetheus (the husband of Pandora), to arrange the proportion in which these materials should be assigned to each. Epimetheus had distributed the best powers among the irrational animals, and Prometheus, that man might not be left altogether helpless, obtained for them by stealth, from Vulcan and Minerva, the arts of fire. Others, poets as well as philosophers, have modified this mythus, according to their particular object. See Welcker's *Die Æschylische Trilogie und die Kabirenweihe zu Lemnos.*

PROMISSORY NOTE. See *Bill of Exchange.*

PRONOUN (*pronomen*); a word which stands instead of another word, or of a sentence, and the use of which is to prevent repetition. Pronouns are of several sorts. Personal pronouns indicate directly a person or thing, as *I, thou, he, it;* demonstrative are those which relate to a present subject, as *this, that*; relative refer to some subject previously mentioned, as *who, which*: interrogative refer to some unknown subject: possessive indicate possession, as *mine, his*. Other divisions, as *reciprocal, indefinite*, &c., are sometimes made.

PRONUBA. See *Juno.*

PROOF. See *Evidence.*

PROOF IMPRESSION. See *Impression, Avant la Lettre.*

PROPÆDEUTICS (*προπαιδεύειν*, to prepare for instruction); a term used by the Germans to indicate the knowledge which is necessary or useful for understanding or practising an art or science, or which unfolds its nature and extent, and the method of learning it. It is applied, therefore, not only to special introductions to particular branches of study, but also to auxiliary sciences, logic, philology, &c., and the encyclopædic views of particular branches of science which facilitate an insight into the relations of the parts. Such a survey can be presented only by one who has studied a science in all its ramifications. The term *propædeutics* is often, of course, merely relative: thus philology belongs to the propædeutics of history, while it is itself the main study of a certain class of scholars. The term, however, in its common use, is generally restricted to the body of knowledge, and of rules necessary for the study of some particular science—rules which originate in the application of the general laws of science or art to a particular department. Thus we find in the catalogues of lectures to be delivered in German universities, medical propædeutics, &c., enumerated.

PROPAGANDA; a name generally given to those institutions by which Christianity is propagated in heathen countries, more particularly to those which were established in the seventeenth century, and especially that erected by the papal court, for the extension of its own power and the Catholic religion among those who were not Christians or Catholics. It was called the *congregatio de propaganda fide* (society for propagating the faith), and was founded by Gregory XV., in 1622. It consisted of eighteen cardinals and some papal ministers and officers of the college; and its object was to arrange and direct all measures relating to the extension of the Catholic faith and the extirpation of heretics. Connected with this was the *collegium seu seminarium de propaganda fide*, instituted by Urban VIII., 1627, for the education of missionaries. Each society met once a week, in the presence of the pope, in a palace built for the purpose. Converts to the Catholic church, who had come to Rome, were instructed and supported by them. Bishops, and other clergy who had been expelled, were also received and supported. The Roman propaganda had a press celebrated for the numerous works which issued from it. Thence breviaries and missals were sent to all parts. Missionary societies for the propagation of the Christian religion have been formed in Protestant countries on this model. (See *Missions.*) In the time of the French revolution, secret societies, whose object was the propagation of democratical principles, were called *propaganda*. *Propaganda* has therefore come to signify any kind of institution for making proselytes.

PROPER NAMES. See *Names*

PROPERTIUS, Sextus Aurelius, a Latin elegiac poet, born at Mevania, in Umbria, was the son of a Roman knight, who had been banished by Augustus, on account of his attachment to Antony. He did not possess the natural ease and grace of

Ovid and Tibullus, but is distinguished for his art and ingenuity, and the brilliancy of his style. He is particularly happy in his description of heroic scenes. We have four books of his elegies. The last of the fourth book is the most highly esteemed, and is often called the "queen of elegies;" yet it is not wholly free from the usual fault of the author—a straining after originality of expression. Love is the subject of many of his elegies, but not a noble, spiritual love, which, indeed, we must not look for in any Roman poet of that age, although all were not so entirely abandoned as Propertius to licentious descriptions. There are also in the fourth book several poems which, although written in the elegiac measure, yet, from their subjects, belong to the class of didactic and narrative poems He makes a display of his learning when he handles subjects of mythology, and therefore affects our feelings less. In general, he imitates the Grecian elegiac poets, particularly Callimachus the Alexandrian. We know nothing more of his life than that, after the end of the civil war, he found a patron at Rome in Mæcenas, through whom he obtained the favour of the emperor. He appears to have been the bosom friend of Ovid, to have lived mostly in Rome, in the enjoyments of love and poetry, and to have died there in the prime of life (about 12 years B. C.) The elegies of Propertius are usually published with the poems of Tibullus and Catullus. The best editions are Bronckhusius (Amsterdam, 1702 and 1727, 4to.), Vulpius (Padua, 1755, 2 vols.), and Burmann and Santen (Utrecht, 1780, 4to.) The latest large critical edition, with a commentary, is by Kuinoel (Leipsic, 1804—5, 2 vols.), and by Lachmann (Leipsic, 1816).

PROPERTY, Literary. See *Literary Property*, and *Copyright*.

PROPHETS; among the Hebrews, inspired teachers sent by God to declare his purposes to his people. The Jews distinguish the authors of the sacred books into the older and later prophets. The former are the authors of the books of Joshua, Judges, Samuel, Kings, and Chronicles; the latter are Isaiah, Jeremiah, Ezekiel, and the twelve minor prophets. David and Daniel they do not call prophets, because they did not live in solitude. Moses they do not include in this classification, but rank him apart by himself. Besides the writers of the sacred books, we find mention of other prophets among the Hebrews, who were sent to warn or instruct that wayward race, and who were sometimes not only endowed with the gift of prophecy, but with the power of working miracles, such as Elijah, Elisha, &c. Samuel, the last of the judges, founded the school of the prophets, in which young men of all the tribes were instructed in the law and sacred poetry. From these schools proceeded the preachers mentioned in the Old Testament, who purified and exalted the religious and moral system of their nation, defended the Mosaic theocracy against the encroachments of the kings and the laxness of the priests (who were occupied merely with religious rites), and foretold the fate of states, with warnings, denunciations, and consolatory prophecies. The deep sense and religious fire of these men, so far before their age, present a phenomenon that can be explained only by the special action of divine influences. They appear, therefore, as messengers of God, divinely inspired seers; and their preachings and songs were preserved by the Hebrews as the word of God, and among them were rendered more impressive by their connexion with poetry and music. Their constant object was the preservation of the doctrines of revelation in their purity. The originality, richness, and sublimity of their writings still awaken the admiration even of those who deny them the character of prophecies. The writings of the prophets form one of the three canonical divisions of the Old Testament, and consist of sixteen books. (See *Bible.*) Four are the books of Isaiah, Jeremiah, Ezekiel, and Daniel, called the "greater prophets," from the length of their writings; the other twelve of the "minor" or "lesser prophets," so called from the shortness of their writings, namely, Hosea, Joel, Amos, Obadiah, Jonah, Micah, Nahum, Habakkuk, Haggai, Zechariah, Zephaniah, and Malachi. (*See the articles.*) Although most Christians consider the prophecies of the Messiah contained in these books as one of the evidences of the truth of Christianity, yet some reject this argument. Among the latter are the German rationalists of the present day. (See Sherlock, Newton, Faber, &c., on the prophecies; and the works of Eichhorn *De Hebräische Propheten*, 1812, 2 vols.), and Rosenmüller.

In modern times, religious fanatics have frequently pretended to be prophets, without being able to demonstrate their claims to the title. The seventeenth century, in particular, was fruitful in prophets and prophetesses; and, even in the beginning of the eighteenth century, the prophets of the Cevennes excited a temporary attention. (See *Cevennes*, and *Camisardes.*) They were called, in England, the "French prophets." The subjects of their prophecies were the appearance of Antichrist, judgments against the city of London, &c. They were condemned as false prophets and disturbers of the public peace, to fines, and to the pillory.

PROPOLIS. See *Bee*.

PROPONTIS (so called by the ancients, from the bordering kingdom of Pontus); the sea lying between the Ægean and the Black seas, and connected with them by the Hellespont and the Thracian Bosphorus; now called, from the largest of its islands, the *sea of Marmora*.

PROPORTION is the equality of two ratios. The comparison of two magnitudes, in mathematics, may be effected in two different ways: it may be determined by how many units the one is greater than the other (difference); or one magnitude may be taken as the measure of the other, and it may be determined how often it is contained in it (quotient.) The former relation is called an *arithmetical* proportion, the latter a *geometrical* proportion. The difference in the arithmetical, and the quotient in the geometrical proportion, are called the *ratio* of the proportion. Every proportion consists of four *terms*, two *extremes*, and two *means*. A proportion in which the two means are equal is called a *continued* proportion; one in which they are unequal, a *discrete* or *interrupted* proportion. As, in every arithmetical proportion, the sum of the extremes is equal to that of the means, and, in geometrical proportions, the product of the means is equal to the product of the extremes, either extreme (or mean) may be found in the former, by subtracting the given extreme (or mean) from the sum of the given means (or extremes); in the latter, by dividing the product of the means (or extremes) by the given extreme (or mean). The mean of a continued arithmetical proportion is found by taking half of the sum of the extremes; an extreme, by subtracting the given extreme from double of the mean. In a continued geometrical proportion, the mean is found by extracting the square root of the product of the extremes; and an extreme, by dividing the square of the means by the given extreme. If we make the fourth term of the proportion the mean of a new continued proportion, and so on, as, for instance, 8 : 11 = 11 : 14; 11 : 14 = 14 : 17; 14 : 17 = 17 : 20, &c., or 4 : 8 = 8 : 16; 8 : 16 = 16 : 32; 16 : 32 = 32 : 64, the numbers 8, 11, 14, 17, 20, form an arithmetical progression, and 2, 4, 8, 16, 32, &c., a geometrical progression.

PROPRETOR. See *Proconsul.*

PROPYLÆA (Greek *προπυλαια*); the splendid entrance to a temple among the Greeks, a square before the temple, surrounded with a portico; on the square in the open air stood the altar. The term was employed particularly in speaking of the superb vestibules, or porticoes, conducting to the Acropolis, or citadel of Athens, which formed one of the principal ornaments of the city. This magnificent work, of the Doric order, was constructed by Pericles, after the designs of Mnesicles, one of the most celebrated architects of his age. Pausanias says it was covered with white marble, remarkable for the size of the blocks and the beauty of the workmanship. Stuart, in his Antiquities of Athens, Le Roy, in his Ruins of Greece, and the Travels of Anacharsis the Younger, mention the relics of the propylæa.

PROROGATION of parliament; the continuance of parliament from one session to another, as adjournment is a continuance of the session from one day to another, or for a longer period. Prorogation determines the session; but adjournment, though for a fortnight, month, &c., does not. After a prorogation, any bill which has previously passed both houses, or either house, without receiving the royal sanction, or the concurrence of the other house, must be taken up *de novo.* Parliament is prorogued by the royal authority, either by the lord chancellor, at the king's command, or by proclamation. In France, the king also prorogues (*proroge*) the chambers (art. 42 of the charter of August, 1830). In the United States of America the term *adjournment* is used both for prorogation and adjournment, properly speaking. Congress is adjourned (prorogued) by the concurrent vote of the two houses; but, in case of their disagreement, the president is authorized by the constitution to adjourn them.

PROSCENIUM (*προσκηνιον*), in the Roman theatres; the place before the scene, where the actors appeared. It was also called *pulpitum*, and was coloured red, by being sprinkled with crocus-water, for the sake of the perfume. It was somewhat lower than the *scena*, but higher than the orchestra, which was in front of it. The place behind the scene where the actors dressed and undressed was called *post-scenium.* See *Theatre.*

PROSE (generally derived from *prorsa* (*oratio*), the reason of which will be given in the course of the article). The true character of prose can be clearly conceived only by considering it in relation to poetry. Their difference lies in the essential difference of certain states of the mind and feelings. The two chief states of the inward man may be called the *thinking* and the *poetical* states, and depend upon the predominance of the understanding, or the imagination and feelings. If we think (in the narrower sense of the word), we combine ideas according to the laws of reason; and prose, which is the language of sober thought, is characterized by the abstractness, generality of precision which belongs to the ideas that occupy the understanding. When the mind is in a poetical state, that is, when the imagination or feelings are strongly excited, then it seeks for language which shall affect immediately the imagination and feelings of others. Warmth, liveliness, individuality, therefore, characterize the language of the poet. A full consideration of the distinguishing features of prose, whose province is fact and opinion, and of poetry, which deals with emotions, would afford room for much interesting discussion; but this our limits preclude. Two of the chief instruments of poetry are imagery and rhythm. It calls in beauty of sound to aid beauty of sense. Clearness and precision are the chief aim of prose; and every thing else must, if necessary, be sacrificed to them; yet man, striving always to combine the beautiful with the useful, does not entirely dispense with musical sounds in prose: and though he does not subject it to the strict rules of metre, yet he arranges the words so as to please the ear by their measured cadence (*numerus*). It is wrong, however, to make verse the distinguishing feature of poetry. How much versified prose exists! and how much poetry, unadorned by metrical language! Metre is a mere consequence of the character of poetry, and does not constitute it.

Prose and poetry cannot be strictly defined, but often run into each other, and many compositions which are called prose have much of a poetical character; for instance, some of the proclamations of Napoleon to his army. Prose, however, in the most common acceptation of the word, is used in contradistinction to metrical composition; hence it is called, by the Romans *oratio soluta.* The external form naturally strikes first, and, in the early stages of society, strikes most; hence the term *prose*, which, as we have already stated, is generally derived from *prorsus, prorsa oratio* (progressive speech), opposed to *verse*, which is derived from *versus* (backwards), returning always to the selected metre. The Greeks called prose *ὁ πεζος λογος*, which the Romans translated *pedestris oratio*; and St Evremond compares prose writers to modest pedestrians. Some have added to the divisions poetry and prose a further division, eloquence, considering the third either as partaking of the nature of both the others, or as essentially differing from both. From what has been said of the difference between prose and poetry, it is clear that poetry must be much earlier developed than prose, because feeling and imagination prevail most with nations in their early periods. We do not mean merely that poetical compositions preceded prose compositions, but the common way of viewing things and expressing thoughts, in early periods, was in images. Histories, laws (*νομοι*), and philosophical maxims, were first conveyed in verse with the Greeks, and many other nations, and, with all, certainly had a symbolical, poetical character. Pliny says that Pherecydes of Scyros (a contemporary of Cyrus) first formed the Greek prose (*prosam primus condere instituit*); but perhaps he was only the first who wrote on philosophico-mythological subjects in prose. Fine prose is among the latest attainments both of nations and individuals; and it would appear that, with most nations, classical prose writers are fewer than classical poets.

PROSELYTE (*Greek*, a stranger; new-comer), in religion; he who leaves one religion for the profession of another; in general, he who changes his religious party, or any other party. The Jews had two classes of proselytes, viz. the "proselytes of the gate," as they were termed, and the "proselytes of righteousness," or of the covenant. The first were those who renounced idolatry, and worshipped the only true God, according to the (so called) seven laws of the children of Noah, without subjecting themselves to circumcision and the other commands of the Mosaic law. They were only admitted to the court of the temple, and stood at the door of the inner temple, whence their name. They had the right of dwelling in the land of Israel, but only in suburbs and villages. Under Solomon, there were 150,000 such proselytes, who laboured in building the temple, and were descended from the Canaanites (2 *Chron*. ii. 17, 18). The proselytes of righteousness were persons who had been fully converted from paganism to Judaism, had been circumcised, and bound themselves to observe the Mosaic law. Before their circumcision, they were examined respecting the grounds of their conversion; after their circumcision they received baptism, being immersed, with their whole body, in a cistern full of water, on a festival, in the presence of three judges. This baptism, known under the name of *proselyte baptism*, was repeated in the case of those children of a proselyte, who had a heathen mother. Boys under twelve, and girls under thirteen, could not become proselytes without the consent of their parents, or, in case of their refusal, the aid of the magistrates. By the baptism, every one was considered as born anew, so that his parents were no longer regarded as such, and slaves thus baptized were set free. Respecting the antiquity of Jewish proselyte baptism, there has been much controversy. The rabbins taught that the proselytes of righteousness received from heaven a new soul and a new essential form. The Mosaic laws, moreover, excluded some persons from the privileges of proselytes, sometimes for ever, sometimes for a certain period. (*Deut*. xxiii., 1—5). That there were proselytes of the first kind, in the time of Jesus, seems to be intimated by the fact that Jesus objected to the Pharisees that they compassed sea and land to make one proselyte, and made him a greater sinner than before (*Matt*. xxiii. 15).

PROSERPINE (*Greek*, Persephone, Persephoneia); according to some, the daughter of Jupiter and Styx; or, according to the more usual tradition, the daughter of Jupiter and Ceres. Pluto carried her off, with the consent of Jupiter, and made her his wife. This fable has been treated by several poets, and adorned in different ways. According to the Homeric hymn to Ceres, Proserpine was once dancing in the choir of nymphs, led by Minerva and Diana, in a grassy meadow. Leaving the dancers, she went with some of her companions to gather flowers. At the prayer of Pluto, and with the consent of Jupiter, the earth produced a hundred blooming narcissuses, from one root, and gods and men were astonished at their beauty, and delighted by their odour. The maid eagerly gathered them, and, beguiled by their magic power, she wandered from her companions. Suddenly the earth opened, and Pluto rose from the chasm, with his immortal steeds, seized Proserpine, and carried her, in a golden chariot, to the lower world. She called loudly on her father for protection, but in vain; no one heard her cries except Hecate and the Sun. Claudian is still more circumstantial in his account. He sings that the beauty of Proserpine had inflamed all the gods with love, particularly Mars and Apollo. In order to deliver her daughter from the importunities of her lovers, Ceres concealed her in a cavern in Sicily, where, with her nurse Calligena, she was watched by dragons. Pluto begged her of Jupiter for a wife; he consented, and ordered Venus to entice the maid out of the cavern by artifice. Venus went to Sicily in company with Minerva and Diana, and not finding the watchful mother at home, they easily persuaded the girl to go to walk. She went out, therefore, in company with the nymphs and zephyrs, to pluck flowers in the blooming fields. Suddenly the earth opened, and Pluto bore the astonished maiden to the lower world, while Jupiter signified his approbation by his thunder. In vain did Jupiter attempt to obtain her mother's consent to her marriage with Pluto, and he at length granted her permission to return to the upper world, provided she had not tasted any of the food of the gods. But while walking through the lovely fields of Elysium, she had eaten a pomegranate, and all that Jupiter could grant to the prayers of her afflicted mother was, that she should spend the spring and summer of each year in the upper world. See *Ceres*.

The Orphic hymns call her the mother of the Eumenides and Ebuleus (Bacchus), the only begotten, the venerable wife of Pluto, the queen of the shades, the avenger of perjury, the companion of the Hours, the all-ruling maid, the fruitful and nourishing, the goddess of spring. She brings all things to light, amuses herself in the fragrant meads, and adorns her sacred bosom with green herbs; she is the resplendent and horned goddess; she is also celebrated, under the name *Mise*, as the mother of Bacchus, the chaste, holy, the ineffable queen, having the form both of man and woman. In the mysteries, Proserpine was also the symbol of the soul confined in the body. She had no children by Pluto; but by Jupiter, who had intercourse with her in the form of a serpent, she bore Zagreus. Jupiter gave her the island of Sicily, and the city of Agrigentum, in this island, was peculiarly sacred to her. She is represented sitting on a throne, by the side of her husband, with narcissus or a pomegranate in her hand, or alone, holding the two-forked trident of her husband. She was also worshipped in Locris and at Megalopolis, and she had a celebrated grove near the lake of Avernus. In Rome, as at Megalopolis, she had a temple in common with Ceres, which men were permitted to enter only once a year. As goddess of the infernal regions, a black, sterile cow was offered to her. The pomegranate, the bat, and the winter, were sacred to her. She was worshipped, together with Ceres, in the Eleusinian mysteries. Pirithous and Theseus, who attempted to carry her off, were obliged, according to some, to remain in the infernal regions. To Proserpine is ascribed the office of cutting off the lock of hair by which the dead were devoted to the lower world. At funerals of the dead, it was usual to smite the breast, as a mark of honour to her. The friends and servants of the deceased cut off their hair and threw it on the pyre, to appease Proserpine. She is often confounded with Hecate. Gerhard has collected the ancient representations of Venus Proserpine, in his *Venere Proserpina illustrata* (Fiesole, 1826).

PROSODY (from *πρὸς*, to, and *ᾠδὴ*, song) treats of quantity, accent, and the laws of versification, and of all that affects the harmony of verse or prose. If we consider the elements of language (the vowels and consonants), we find that the sound dwells upon the vowel, and longer if several vowels stand together and combine to form one sound. Double vowels, therefore, and diphthongs, render syllables long. Further, as to consonants; if several follow each other, they also require the voice to dwell on them, and, therefore, likewise render the syllable long. Consonants following each other, without intermediate vowels, affect the length of the syllables by *position*, as it is called. The proportion of vowels and consonants is very different in different languages. (See *Consonants*.) Idioms, the principle of which is euphony (e. g. the Italian and Spanish), give a preponderance to the vowels, and avoid successive consonants. In the northern languages, on the other hand, the consonants prevail, and too often follow each other; but three in succession are less frequent, and prolong the sound still more. Three consonants, in German, would render a syllable long by position. Such a determination of the time, according to the proportionate weight of syllables, is called *quantity*, and languages, in which vowels predominate, incline more to quantity; on the other hand, idioms, in which consonants prevail, incline more to accent, as they determine the duration of the tone more by the logical priority of the syllables. The German language is of the latter sort, though the meaning or derivation does by no means always determine the length of the syllables in this language. The Germans have, moreover, distinct long and short syllables, like the Greeks and Romans, and of late have very much settled their prosody, so that they are enabled to write in all the ancient metres. The other modern languages of Europe, west or south of Germany, have not long or short syllables, properly speaking. The English language has no prosody, in the ancient sense of the word: its verse depends upon accent and the number of the syllables. See *Rhyme*, and *Versification*.

PROSOPOPŒIA. See *Personification*.

PROTAGORAS; a Grecian philosopher, born at Abdera, in the middle of the fifth century B. C. He taught principally at Athens. He may be considered one of the first Sophists who travelled in Greece, reading his writings, holding public disputations, and giving instruction for pay. He was accused of atheism, and banished from Athens, and his writings were publicly burnt. He is said to have denied that there was any such thing as absolute truth, and to have applied his doubts of human knowledge to the most sacred and important subjects,—virtue and the existence of God,—maintaining that they might as well exist as not exist. How far this is true cannot be determined with certainty, because his writings are lost.

PROTECTOR, Cardinal. Every Catholic nation and religious order has a protector, residing in Rome, who is a cardinal, and is called *cardinal protector*.

PROTECTOR, Lord. See *Cromwell*.

PROTECTOR OF SLAVES. An officer entirely novel, and intended to give some legal protection to slaves, was created by the English ministry of earl Grey, by a British order in council, of November 2, 1831, constituting in the colonies of Trinidad, St Lucia, the Mauritius, British Guiana, and the cape of Good Hope, certain officers, called *protectors of slaves*. They are never to be proprietors of slaves; are to receive complaints of slaves against their masters and others; may summon the latter to appear before them; and institute a prosecution against them before the proper tribunal. If a slave is prosecuted before a court, notice must be given to a protector, who personally, or by an assistant protector, must be present at the trial, in order to protect the interest of the slave. The protector also keeps a register of all the slaves of his district; has the power to enter any plantation or building, where he believes slaves are ill-treated; to grant them marriage licenses, and to attend, in various other ways, to the preservation of good order among them.

PROTECTOR OF THE CONFEDERATION OF THE RHINE. See *Bonaparte*, and *Confederation of the Rhine*.

PROTESILAUS, one of the Grecian heroes at Troy, was the son of Iphiclus, king of Phylace, in Thessaly, and of Diomedea. His original name was Iolaus, and he received the surname of Protesilaus, because he was the first of the Greeks who leaped ashore on their landing before Troy; but he was immediately killed by a Trojan warrior, according to some by Hector. His tomb was on the Sigæan promontory. He was honoured as a hero after his death, and had an oracle at Elæus in the Chersonesus, particularly for athletæ; he also healed several diseases.

PROTEST; a solemn declaration of opinion, commonly against some act, particularly a formal and solemn declaration, in writing, of dissent from the proceedings of a legislative body, as a protest of the lords in parliament, or a like declaration of dissent by a minority of any body, against the proceedings of the majority. In commerce, a formal declaration, made by a notary public, under hand and seal, at the request of the payee, or holder of a bill of exchange, for non-acceptance or non-payment of the same, protesting against the drawer and others concerned, for the exchange, charges, damages and interest. This protest is written on a copy of the bill of exchange, and notice is given to the endorser of the same, by which he becomes liable to pay the amount of the bill, with charges, damages and interest. (See *Bill of Exchange*.) The name of *protest* is also given to a like declaration against the drawer of a note of hand, for non-payment to a banking corporation, and of the master of a vessel against seizure, &c. A *protest* is also a writing, attested by a justice of the peace, or a consul, drawn by a master of a vessel, stating the severity of a voyage, by which the ship has suffered, and showing it was not owing to the neglect or misconduct of the master.

PROTESTANTISM includes the Protestant religion in its various forms, and the history of its development, as well as the influence which it has had on mankind. This name, like many others in history, owes its origin to a circumstance comparatively insignificant. It originated in Germany, when those members of the empire who were attached to the reformation, protested (April 19, 1539), before the assembled princes, against the following resolve of the diet at Spire: "that, until a general council should be held, further innovations in ecclesiastical affairs should be avoided; the mass should not be any further abolished, nor its celebration be prevented in those places whither the new doctrine had already spread; no inflammatory sermons should be preached; and no vituperative writings be printed." In consequence of this protestation, they were called *Protestants*, and soon adopted this name themselves. To this protestation was added (April 25) a formal appeal to the emperor against every measure hostile to their faith. The word *Protestant* was afterwards adopted, also, in other countries; and when, in 1817, the centennial celebration of the beginning of the German reformation caused several controversies in Prussia, the government prohibited (June 30, 1817) the further use of the term *Protestant* in the country, as being obsolete and unmeaning, since the Protestants did not any longer protest, and ordered the word *evangelical* to be substituted for it. The numberless sects which have sprung up among the seceders from Catholicism, since the time of the reformation, and which are comprehended under the name of *Protestants*, all agree (however different their opinions on some important points may be) in rejecting human authority in matters of religion, taking the Holy Scripture as the sole rule of their faith and life, and adhering to particular creeds only as expressing the convictions in which all their members agree. (See *Reformation*.) The present number of the Protestants and Catholics is given in the article *Ecclesiastical Establishments*.

PROTEUS, according to the old Grecian mythology, a deified mortal, a soothsaying and wonder-working old man of the sea, who fed the *phocæ* of Neptune in the Ægean sea, and was said by wandering mariners to sun himself with his sea-calves, and to sleep at mid-day, sometimes on the desert island of Pharos, near the western mouth of the Nile, and sometimes on the opposite side of the Mediterranean, in Carpathus (the modern Scarpanto), between Crete and Rhodes. He prophesied only when compelled by force and art. He tried every means to elude those who consulted him, and changed himself, after the manner of the sea gods, into every shape, into beasts, trees, and even into fire and water. But whoever boldly held him fast, to such a one he revealed whatever he wished to know, whether past, present, or future. Thus Menelaus surprised him (*Odyssey*, iv, 351), and compelled him to aid him by his prophecies and his counsel. Homer calls Proteus *Egyptian*, either in the literal sense, or to signify that he lived in the neighbourhood of the river Egyptus. Later writers represented Proteus as a king in the time of the Trojan war, who, either by divine skill, or by an artful change of the ornaments of his head, could assume various forms. According to other accounts, which, perhaps, Virgil had in view, Proteus was a deified sorcerer of Pallene, a peninsula of Emathia or Macedonia. Disturbed by the profligacy of his sons, he went, in the time of Hercules, under the sea to Egypt, and in that unfrequented part of the sea kept the sea-calves of his master Neptune, who had given him the wonderful power of prophesying. The later mystics made him an emblem of primeval matter, and he is thus represented in the 24th Orphic hymn. This mortal-born sea-god now became a son of Neptune and Phœnice, or of old Oceanus himself and Tethys. Psamathe was his wife, by whom he had many sons and daughters, whose names are differently given. Any one who hastily changes his principles is, from this old sea-god, called a *Proteus*.

PROTHEEITE; a new mineral, found in the valley of Zillerthal, in the Tyrol. It occurs in rectangular prisms, with faces longitudinally striated; colour chrysolite-green; lustre between glass and diamond; heavy; scratches glass; infusible before the blow-pipe, and is electric by friction.

PROTOCOL (from the Latin *protocollum*); a record or register. In French, *protocol* means the prescribed formula for instruments accompanying certain transactions, and in German it signifies the minutes of any transaction. In the latter sense the word has, of late, been received into international law, and we hear much of the London *protocols* respecting Greece, Belgium, &c. The word comes from the Greek, and is used as early as in the fortieth novel of Justinian, which forbids the cutting the *protocollum* of charters—a short note, showing the year in which the paper or parchment was made, and the officer commissioned for the delivery of the instruments, by means of which frauds were frequently detected. See Du Fresne's *Glossary*.

PROTOGENES; a Greek painter, contemporary with Apelles, according to some, born in Rhodes, according to others, in Caria. (See *Apelles*.) Several master-pieces of his are mentioned, particularly a picture of Jalysus, who is said to have been the founder of the city of Rhodes. In this picture a hound was represented panting, and with froth on his mouth. Pliny relates, that for a long time the painter was unable to satisfy himself in the execution of the froth; but that, at last, in a fit of anger, he threw the sponge, with which he used to wipe off the colours, on the painting, and thus accidentally produced a natural representation of it. This picture saved the city of Rhodes, when it was besieged by Demetrius. In the time of Cicero it was still in that city, but Cassius carried it to Rome, and placed it in the temple of Peace, in which it was burnt during the reign of Commodus.

PROTRACTOR. An instrument for laying down and measuring angles on paper with accuracy and despatch, and by which the use of the line of chords is superseded. It is of various forms—semicircular, rectangular or circular.

PROVENCAL POETS were romantic poets of chivalry, in the twelfth and thirteenth centuries in the south of France and in Spain. These southern countries at that time bore the common name of *Provence*, which included, beside the country situated between the Rhone and the Var, Languedoc, Gascony, Auvergne and Burgundy. They were united in the beginning of the twelfth century, under Raymond Berengarius IV., previously count of Barcelona or Catalonia, and by marriage, count of Provence (as such, Raymond Berengarius I.), and afterwards comprehended also Arragon, and a great part of the west of Spain. The people were called *Provençals*, and were separated from the less polished French by the Loire. Southern France, already refined by colonies from Greece, and by its vicinity to the Romans, favoured with a milder climate and a freer government, was, until the eleventh century, far in advance of the north in civilization, and possessed a language composed of Roman and Teutonic words, and so much distinguished for clearness, tenderness, sweetness and copiousness, that it was spoken by the higher classes even in Catalonia, Valencia, Majorca, &c. The language, the cultivation of the nobles by their intercourse with the East, particularly with the poetical Arabs, an imagination awakened, and an understanding enlarged by travel and adventure, a romantic spirit, and the wealth produced by commerce,—all these circumstances contributed to foster genius and to produce poetry. The poet sang war and adventures, religion and love, and for encouragement and applause, particularly from the ladies, who were celebrated in his verses. The taste for poetry became general among the nobles and cultivated classes in Provence, and the princes, particularly Raymond Berengarius III. and V., favoured the poetical art. In their court, at that time the most refined and splendid in Europe, it was customary to collect a circle of noble poets. Poetry and song, accompanied by the lute, harp, or viol, were demanded at every feast, and many persons therefore wandered about to enliven festivals with such accompaniments. The words *Provençal* and *poet* became almost synonymous. Their songs, which were in rhyme, and which often proceeded less from poetic inspiration than from a spirit of imitation, are divided into three principal classes: 1. Canzonets, love songs and joyful (*soulas*), plaintive (*lais*), pastoral (*pastourelles*), and religious or didactic songs; 2. Sirventes, songs in honour of heroes and princes, in which class were included patriotic and war songs; 3. Tensons, sometimes on questions of gallantry, which were recited in the courts of love (*cours d'amour*). The favourite subjects were love and ladies; and the poets endeavoured to rival each other in the praises of their mistresses; but they were less tender and chaste than the German *Minnesingers*. (q. v.) Although their poems, as a whole, are not much to our taste, they contain occasional fine passages (which must be read in the original, as their principal charm consists in the expression), and although they have little true poetical merit, as they consist rather of fantastic conceits and hackneyed rhymes, than of the outpourings of an elevated soul, yet it is not to be denied that they were of great advantage to that age, by forming the mind, enriching the language, exciting men to action, and ladies to make themselves worthy of love. The Provençal poets were also called *Romans*, and the Provençal language was called the *Romana*, as it was derived principally from the Latin. These poets were likewise called *Troubadours* (q. v.; in Italian, *Trovatori*), while the Norman-French poets of a somewhat later period, who wrote in French the nonsensical, conceited and absurd romances (the first of which was the tedious, but then popular, *Roman de la Rose*), heroic poems (of the twelve peers of Charlemagne, of the knights of the round table, and of the Amadisses), *Contes* and *Fabliaux*, and who were particularly favoured by Charles VI., were called *Trouvères*, or *Trouveurs*. (See *France, Literature of*, division *Poetry*.)

The oldest Troubadour, whose name and poems are known to us, is William, count of Poitiers and Guienne (born 1071), who sang the adventures of his crusade, although there must have been others who sang before him. Raynouard discovered a Provençal poem of the year 1000, in rhyme. The flourishing period of this school of poetry extends from 1090 to 1290, and its popularity was at its height about 1140, and at the time when Berengarius III. received the investiture of Provence from the emperor Frederic I. Not only the nobles and many ladies in Provence, but many celebrated foreign princes (e. g. Richard the Lion-hearted), and the Italian nobles, partook of the enthusiasm in its favour. The charms of the Provençal poetry and language were more early widely felt in Italy (where Folchetto was the first known poet of this school), and in Spain (the country of the Limousin Provençal poets), where many princes were poets (Alphonso II., Peter III. and IV.), and later in Sicily. The history of Romeo de Villeneuve (the Pilgrim), who was minister of the tenth count of Provence, Raymond Berengarius (from 1206 to 1244), and who is praised by Dante, deals in the marvellous, and was considered by Baudrier (1635) as a romance. These materials have been worked up in a new form in the *Peregrinazioni ed Avanture del nobile Romeo da Provenza* (Turin, 1824). The decline of the Provençal poetry began in the fourteenth century, in the first half of which, prizes were offered (at Toulouse golden violets, afterwards silver marigolds and roses), for the encouragement of poets. The last whom Millot, the author of the principal work on this subject, *Hist. Littéraire des Troubadours* (Paris, 1774, 3 vols.), cites is Jean Esteve de Blesières (about 1286). At length this amusement became wearisome, the understanding took the place of fancy, the nobility lost their splendor, the princely patrons of poetry became extinct, the French line of kings who succeeded, favoured the French language instead of the Provençal, and materials failed when the adventures of chivalry ceased to exist; no powerful Petrarch arose among the Provençals, and instead of the singers, who, if they really were Troubadours, were called *minstrels*, succeeded actors and jugglers, who disgraced the name of Troubadours, and whose meanness soon caused the earlier and better poets to be forgotten. We have still much of the Provençal poetry left. Some of the pieces are religious romances. See Raynouard's *Choix des Poésies originales des Troubadours* (Paris, 1816—21, 6 vols.), to which collection is prefixed a *Grammaire Romane*; see also A. W. Schlegel's *Observations sur la Littérature Provenzale* (Paris, 1818).

PROVENCE; one of the old provinces of France, lying in the south-eastern part of the country, on the Mediterranean, bounded on the north by Dauphiny, and on the west by Languedoc. Its natural boundaries were the sea, the Rhone, the Var and the Alps. The capital was Aix, and the province was divided into Upper and Lower Provence. The departments of the Mouths of the Rhone, the Lower Alps and the Var, with a part of that of Vaucluse, have been formed from it. Greek colonies were founded here at an early period (see *Marseilles*); and the Romans, having conquered the country (B. C. 124), gave it the name of *Provincia* (the province), whence its later name was derived. After the division of the empire of Louis le Debonnaire, it fell to Lothaire, and was afterwards a separate kingdom, under the name of the kingdom of Arles. In 1246, it passed to the house of Anjou by marriage; and, in 1481, on the extinction of the male line of that house, Louis XI. united it to the dominions of the French crown. (For its language and literature, see *France*, division *Language*, and the article *Provençal Poets*.)

PROVERBS are the flower of popular wit and the treasures of popular wisdom; they give the result of experience in a form made impressive by rhyme, alliteration, parallelism, a pointed turn, or a comparison drawn from the most ordinary scenes and occurrences of life, which, by the force of association, makes their effect strong and permanent. Proverbs may be unassuming, lively, grave, or even sublime; their general character is *naiveté*. The habit of men, at the present day, to communicate so much with each other by writing, which, exciting the feelings less than conversation, leads to a less animated mode of expression, and the disposition to avoid what is common, springing from the pride of intellectual cultivation incident to an advanced stage of society, and various causes connected with the progress of civilization, make proverbs every day more unfashionable with the most civilized European nations, particularly in this country, where the use of a proverb (except it be one of a foreign nation) is considered almost vulgar; and the same contempt for these jewels of the multitude has spread to America. Another reason for proverbs going out of fashion may be, that the better a proverb is, the more trite it becomes; and what is trite is vulgar, and what is vulgar is inelegant. Thus a public speaker could not use the proverb, "'Twixt cup and lip is many a slip," at least, not without some apology for its triteness, although the very triteness in this, as in most other cases (such as often quoted verses), proves merit; and even this homely proverb undoubtedly has often led to care and thoughtfulness. Proverbs often save long explanations by presenting a striking image; and many a lecture has probably been superseded by the French adage, "One spoonful of honey attracts more flies than a hundred barrels of vinegar." So they may be often used with effect to point the conclusion of a discourse. A period on the failure of men who strive beyond their capacity, might be well closed by the Arabian saying which Burckhardt mentions, "If God purposes the destruction of an ant, he gives her wings;" and the vanity of human resolutions could hardly be set in a stronger light than by the Portuguese proverb, "Hell is paved with good intentions"—a proverb which, until it has become familiar, is awfully impressive. It requires skill to apply proverbs elegantly and judiciously in common life. As to the general worth of proverbs, we would say, with one of their number, *Vox populi, vox Dei*. Yet there are many directly opposed to others, and they must always be received *cum grano salis;* they are general views of things, and "no rule without an exception." Proverbs are plain spoken. In their view, as in the eye of the law, all equal. They take cognizance of the virtues, and vices, and follies, of all classes, without respect of persons. They pierce the object at which they aim; and this, in fact, gives them currency, and makes them what they are. Boileau speaks of happy expressions,

> *Qui, par le prompt effet d'un sel rejouissant,*
> *Deviennent quelquefois proverbes en naissant.*

Such a phrase is Napoleon's, "There is but one step from the sublime to the ridiculous," which may be almost said to have become a proverb, as is the case with many other expressions struck out in happy moments, or proceeding from conspicuous persons. The proverb is nearly related to the motto, symbol, device, sentence, apologue, fable, &c.; and the limit cannot always be easily drawn. Burckhardt gives us the following as Arabic proverbs: The wolf was asked, "For what art thou following those poor little sheep?" He replied, "The dust upon which they tread is good for my poor little eyes." And this: one man said to another, "O slave, I have bought thee." "That is thy business," replied he. "But wilt thou run away?" "That is my business," replied he. These, having at once a narrative character, and a concise, pointed expression, partake of the nature of the apologue and the proverb. Certain sallies of popular humour, ludicrous personifications, &c., which are frequently repeated, are sometimes called *proverbs*; as, "What a dust we kick up, as the fly said to the cart-wheel." Proverbs, being the offspring of popular feeling and experience, often serve, of course, to keep alive the recollection of peculiar views and customs; and a collection of the sayings of different nations would form an exceedingly useful and interesting work. Burckhardt collected, at Cairo, a number of Arabic proverbs, which have been published, in a quarto volume, under the title Arabic Proverbs, or the Manners and Customs of the Modern Egyptians (London, 1830.) Sailer has published the Wisdom of the Streets, or the Meaning and Use of German Proverbs (Augsburg, 1810, in German.) Many other collections of German proverbs exist, but none very complete. The collections of English and Scotch proverbs are numerous; we may merely specify Ray's, Allan Ramsay's, and Henderson's.

PROVERBS, Book of. See *Solomon*.

PROVIDENCE, the largest place and only city in Rhode Island, is situated at the head of the tide-waters of Narraganset bay, about thirty miles from the Atlantic ocean, and is forty miles south-south-west of Boston, 190 north-east of New York, 394 north-east of Washington; lon. 71° 26′ W.; lat. 41° 51′ N.: population, in 1820, 11,767; in 1825, 15,941; in 1830, 16,832; in 1832, about 20,000. It is thus the second town in New England, in point of population. It is built on both sides of what is usually styled *Providence river*, which is only an arm of the bay reaching to the mouth of Mooshasuck river, at the upper part of the city, its two sections being connected by two bridges, one ninety feet in width. Vessels of nine hundred tons burthen can come to the wharves. The buildings are chiefly wood, uniformly painted white, though there are many of granite and brick. Some of the dwelling-houses are spacious and elegant, and those on the high ground on the eastern side of the town are remarkable for beauty of situation. The chief public buildings are the state-house, of brick; the arcade, of granite; fourteen houses of public worship; the halls of Brown university; the Dexter asylum; the Friends' boarding-school; five public school-houses, and several large manufacturing establishments. The arcade is the most splendid building of the kind in the Union; it has two fronts, of hammered granite each seventy-two feet wide, presenting colonnades, of the pure Grecian Doric, of six columns each. It was finished in 1828, and the whole cost was about 130,000 dollars. Of the churches, the first Baptist, the two Unitarian, and one of the Episcopal (St John's), are handsome structures. Brown university (originally founded at Warren, in 1764, and removed to Providence in 1770) takes its name from Nicholas Brown, its most munificent benefactor. It has two halls, both of brick, viz. University hall and Hope college. They are placed on some of the highest ground in the city. The college library contains about 6000 volumes. Three other libraries within the walls, belonging to literary societies, present an aggregate of 6000 volumes, in addition. The government of the university is vested in a board of fellows, consisting of twelve members, eight of whom, including the president, must be Baptists; and a board of trustees, of thirty-six members, twenty-two of whom must be Baptists, five Friends, five Episcopalians, and four Congregationalists. The acting officers of instruction, at present, are the president, three professors, and two tutors. There are above 100 students. The whole number of graduates to 1827, inclusive, 1119. The present condition of the institution is prosperous. The public schools were established in 1800, and now consist of five grammar schools, five primary schools, and one African school. They originated with the mechanics' and manufacturers' association. The Providence library contains about 1600 volumes; the mechanics' apprentices' library about 1000; and that of the Athenæum about 1500.

Providence was early a place of much commercial enterprise. In the first half of the year 1791, the duties paid on imports and tonnage amounted to 59,766 dollars 14 cents; in the year 1831, the whole amount collected was 227,000 dollars, notwithstanding the diminution of the rates of duties on many articles, which reduced the sum 36,000 dollars, at least. The imports in 1831 amounted to 45[illegible] dollars; the exports, domestic 199,193 dollars, foreign 130,441 dollars, total 329,634 dollars. The amount of shipping registered is 12,362 tons; enrolled, 4788 tons. There are four insurance companies, with an aggregate capital of 360,000 dollars; and fifteen banks, with an aggregate capital of 4,502,800 dollars, besides a branch of the United States bank, with a capital of 800,000 dollars, and the savings bank, capital 100,000 dollars. The Blackstone canal, extending from Providence to the town of Worcester (Mass.), was finished in 1828; whole cost about 700,000 dollars. It is navigated by thirty boats, from twenty-five to thirty tons each. There are ten newspapers published in Providence, two of which are daily. Providence is most distinguished for its manufactures. There are in Providence four cotton factories, two moved by steam and two by water power, employing a gross capital of 327,489 dollars. They contain 11,194 spindles, and 244 looms. They give employment to 352 persons directly, besides 739 others, dependent, more or less, on them, with an aggregate annual amount of 45,801 dollars wages. They consume annually 434,971 pounds of cotton; spin 382,875 pounds of yarn, and weave 1,458,000 yards of cloth, mostly of the finest and most valuable quality, to the estimated value of 247,860 dollars. There are also extensive bleacheries, in which very large quantities of cotton cloth, from many of the factories in Rhode Island and other states, are bleached, calendered and beetled. There are iron founderies and machine shops, employed principally in building cotton machinery, and estimated to constitute one third of the whole amount of this business carried on in the state, there are, besides, establishments for working sheet-iron, in tin, copper, brass, &c.; a large glass-house, for the manufacture and cutting of flint-glass;

also extensive manufactures of leather, boots and shoes, soap and candles, cabinet furniture, hats, &c., and pickers, and sundry articles used in other departments of the manufacturing business. The capitalists of Providence have, besides, an amount equal to 2,000,000 dollars invested in cotton, woollen, and other factories, in other towns of Rhode Island and the adjoining states, agencies of which are established within the city. For the consumption of the town and its vicinity, including, as this does, many manufacturing villages, there were imported, in the year 1830, 45,166 bales of cotton, and, in the year 1831, 55,707; and of bread-stuffs, in 1830, 68,473 barrels of flour, 358,181 bushels of corn, and 16.967 of rye; in 1831, 71,369 barrels of flour, 216,662 bushels of corn, and 7772 of rye.

This town was founded by Roger Williams, who was born in Wales, and educated at Oxford. He removed to America in 1631, and, after preaching at Salem and Plymouth, was settled at the latter place, as pastor of the congregational church, in 1634. He there preached against the king's patent to the Plymouth colonists, on the ground that the king had no authority to grant and dispose of the lands of the natives, without their consent. For this course, together with his peculiar religious tenets, and particularly his open and fearless declaration of the principles, not of *toleration* merely, but of *entire and unrestricted religious freedom*, and his avowal that the civil magistrate had no right "to deal in matters of conscience and religion," he was banished, and ordered to depart the Plymouth jurisdiction within six weeks. This sentence was passed in the autumn of 1635; but he was afterwards informed that permission was granted him to remain until the ensuing spring. So great, however, was the fear of his influence, that an officer was sent to apprehend and carry him on board a vessel at Nantasket, in order that he might be conveyed to England. Before the arrival of the officer, Williams, having intimation of this design, had departed for Rehoboth. Being there informed by governor Winslow that he was still within the bounds of the Plymouth patent, he crossed the Seekonk river, in the spring of 1636, and commenced a new settlement in the wilderness, near the mouth of the small river Mooshasuck, giving it, in acknowledgment of the divine protection, the name of *Providence*. The first settlement of the town was thus made on the point of land between the Seekonk or Blackstone river on the east, and the arm of the Narraganset bay on the west. The latter was afterwards gradually contracted by the extension of the land in the present westerly part of the town, until the two parts were, at length, connected by Weybossett bridge, now nearly in the centre of the town. The sheet of water remaining north of this bridge was thus formed into a beautiful cove, which, at its northern extremity, receives the Mooshasuck river, and forms the basin of the Blackstone canal. In 1676, during the war which was made, at the instigation of king Philip, for the extermination of the New England colonists, an attack was made on Providence by the Indians, and about forty houses burned and destroyed. In 1801, it suffered severely from an extensive fire. In 1807, a violent storm and flood destroyed nearly all the bridges, and a great number of buildings, in the town and its vicinity. In the great storm of September, 1815, about 500 buildings were destroyed by the wind and the water of the bay. The loss of property on that occasion was then estimated at more than 1,000,000 dollars; but that eventually proved of much benefit to the place, by removing a great number of old and comparatively useless buildings, whereby an opportunity was afforded for new and commodious streets in those sections which are devoted to commercial business. In October, 1831, Providence was incorporated as a city, divided into six wards. Its municipal government is vested in a mayor, a board of six aldermen, and a common council of twenty-four members.

PROVIDENCE, or NEW PROVIDENCE; the second island, in point of size, among the Bahamas, being thirty miles in length and eight in breadth; lat. 25° 2′ N.; lon. 77° 20′ W. A part of it is very fertile; but its principal business arises from the misfortunes of those ships which are compelled to seek it for a harbour. The port is called *Nassau*, and is situated on the north part of the island. Its harbour is rather shallow; but it is the capital, and by far the most commercial town of the Bahamas. The population of the island is supposed to be about 8000, the greater part of whom are slaves. See *Bahamas*.

PROVIDENCE PLANTATIONS. See *New England*, and *Providence*.

PROVINCE (*provincia*), among the Romans; a district of conquered country, governed by a proconsul or propretor (see *Proconsul*), and called therefore *provincia consularis*, or *prætoria*. But this name was only applied to lands lying beyond the boundaries of Italy. In the time of Augustus, they were divided into the *provinciæ senatoriæ*, or *populares* (the people's provinces), and the *provinciæ imperatoriæ* (the emperor's provinces). The latter comprised those which were most exposed to hostile inroads, and the administration of which was left entirely to the emperor, under the pretence of sparing the senate and people the trouble of managing them, but in reality to keep the army in his own hands. They were different according to circumstances. In modern times, the term has been applied to colonies, or to dependent countries, at a distance from the metropolis, or to the different divisions of the kingdom itself. Thus the Low Countries belonging to Austria and Spain were styled *provinces* (see *Netherlands*); and the same term is applied to some of the English colonies. The different governments into which France was divided, previous to the revolution, were also called *provinces*. The name has sometimes been retained by independent states. Thus the republic of Holland, after it had thrown off the Spanish yoke, was called the *United Provinces;* and the Argentine republic has assumed the name of *United Provinces of the Plata*. In England, the jurisdictions of the two archbishops are styled *provinces*.

Provincial is a monastic officer who has the superintendence of the monasteries of his order within a certain province or district, and is himself subordinate to the general of his order.

PROVOST (from *præpositus*); in some of the Scotch cities, the title of the chief municipal officer. (See *Prévot*.) The heads of several of the colleges in the universities of Oxford and Cambridge are also styled *provosts*.

Provost marshal of an army is an officer appointed to arrest and secure deserters and other criminals, to hinder the soldiers from pillaging, to indict offenders, and to see sentence passed upon them and executed. He also regulates weights and measures.

PRUDHON, Pierre Paul; a French painter, born in 1760, at Cluny, where he was educated by the monks of the celebrated abbey of the place. The sight of the pictures here awakened his taste for painting, which being observed by the monks, the bishop of Macon had him instructed in drawing at Dijon. After having studied in Rome, whither he was sent by the Burgundian estates, Prudhon returned to France in 1789, and lived some time in obscurity in Paris, but finally gained reputation by his celebrated allegorical picture, Crime pursued by Divine Justice. He died in 1823. His principal productions are Psyche borne away by the Zephyrs, Zephyr sporting over the Water, an Assumption, and a Dying Christ. Some have censured his design, and the sameness of his heads; but his brilliant colouring, and the fine expression and grace of his pencil, are generally admired.

PRUNES. See *Plums*.

PRUSSIA; the smallest of the (so called) great powers of Europe; a country in several respects singular, being composed of very heterogeneous parts, several of them not connected by any common feeling or common interest, not even by geographical situation, but merely by artificial political system; and yet it holds an influential station among the European powers. Another very striking feature of this monarchy is the care which it bestows on science and education. The sciences are no where fostered with more care, and there are few countries in which common schools are more widely diffused. Notwithstanding the effect which this must have in enlightening the people, and notwithstanding the attention which has been paid, for several generations, to the administration of justice, there is an almost incomprehensible backwardness in every thing which belongs to a civic spirit, chiefly, it is probable, from three reasons: 1. that the greatness of Prussia proceeded from, and has been supported by, military power, the power of standing armies, and the whole system of government has been carried on with something of a military spirit by numerous officers in regular gradations, who execute the orders received from their superiors. 2. That many of the various parts composing the monarchy have no national interest, as Prussians, in each other; so that the noblest germs of civil virtue remain undeveloped in the breasts of the people, whose interests are diverse. We may add here, by the way, that Prussia, of late, has neglected the most important means of giving coherency to her population, namely, the assembling of representatives from all the various provinces in one legislative body. Nothing would have united the people more strongly than thus awakening a national feeling for a common institution. 3. That, since the time of Frederic the Great, Prussia has felt obliged to seek a stronger ally in Russia to strengthen herself against Austria—an alliance which has much retarded her civil advancement.

We shall now proceed to the *Statistics and Geography of Prussia*. The Prussian monarchy, which contained 3,000,000 of inhabitants, on 46,428 square miles, with an army of 76,000 men, when Frederic the Great ascended the throne, contained, in 1804, without reckoning Neufchatel, 9,977,497 inhabitants, upon 120,395 square miles (with 38,000,000 of Prussian dollars income, about 32,000,000 Spanish), and at the end of 1828, 12,726,823 inhabitants, upon 106,852 square miles, with 3,316,459 buildings, to which is to be added Neufchatel, with 51,580 inhabitants, upon 296 square miles; and, at the close of 1830, the number of the inhabitants was 12,939,877. The whole increase of the population in fourteen years has been 2,247,082. In 1826, the population stood thus:—

Germans,	10,038,457
Of Sclavonic origin,	2,028,500
French Walloons,	87,600
Jews,	153,687

The numbers belonging to the chief religious denominations, in 1826, were,

Evangelical (comprising Lutherans and Calvinists),	[illegible]
Catholics,	[illegible]
Jews,	[illegible]
Mennonites,	[illegible]

The military consisted, in 1829, of 165,000 regular troops (of which 17,908 were guards, 19,132 cavalry, 15,718 artillery, and 104,712 infantry of the line), and of 524,248 *Landwehr* (q. v.), of which 179,624 were of the first class, and 179,624 of the second class: the whole military force, therefore, comprised 524,248 men. Revenue for 1829 about 36,190,000 Spanish dollars; national debt, in 1829, 135,370.000. The revenue, for 1829, was levied thus:—

	[illegible]
Domains and royal forests,	[illegible]
Sale of domains,	[illegible]
Mines, salt works,	[illegible]
Manufactures of porcelain,	[illegible]
Post department,	[illegible]
Lotteries,	[illegible]
Salt monopoly,	[illegible]
Balance from Neufchatel,	[illegible]
Tax on real estate,	[illegible]
Tax called *class-tax*,	[illegible]
Tax on occupations,	[illegible]
On, excise, duties and stamp,	[illegible]
Highway toll,	[illegible]
Extraordinary revenue,	[illegible]

The army cost, in 1829, 15,692,562 dollars. The number of students at the universities stood thus in the following years:—

	Founded.	Year.	[illegible]
Berlin,	1810	1829	[illegible]
Halle,	1694	1828	[illegible]
Breslau,	1702	1828	[illegible]
Bonn,	1818	1829	[illegible]
Königsberg,	1544	1829	[illegible]
Greifswalde,	1456	1829	[illegible]
Munster,	1631	1827	[illegible]

(For the schools of Prussia, see the article *Schools*.) The chief cities are

	Inhabitants.
Berlin (the capital),	[illegible]
Breslau,	[illegible]
Cologne,	[illegible]
Königsberg,	[illegible]
Dantzic,	[illegible]
Magdeburg,	[illegible]

The peace of 1815 did not give compactness to the irregular territory of Prussia. It consists (Neufchatel not included) of an eastern and a western part: the former, which is much the larger, is bounded by Russia, Austria, the kingdom of Saxony, the small states in Thuringia, the electorate of Hesse, Hanover, Brunswick, Mecklenburg, and on the north by the Baltic. The latter is separated from the former by the electorate of Hesse, Hanover, and Brunswick, and is bounded by the Netherlands, France, Bavaria, Lippe-Detmold, Nassau, Waldeck, and other small territories. The country is mostly level, with small elevations. The island of Rugen, with its promontory Stubbenkammer, is the highest point in the lands on the Baltic. The principal chains of mountains are the Sudetes, with the Riesengebirge (the Schneekoppe, 4950 feet high); the Hartz (q. v.), with the Brocken; the Thuringian forest; the Westerwald, with the Siebengebirge; the Hundsruck, with the Hochwald; and the Eifel, a continuation of the Ardennes. The rivers are mentioned below. The climate is, on the whole, variable, and severe rather than mild and warm; yet, in the valleys of the Nahe, Moselle, Saar and the Rhine, it is very fine. Since 1815, the monarchy has been divided into ten provinces and seven military districts. The provinces are subdivided into two or three governments, of which the smallest in point of population contains 148,948 inhabitants, and the largest in this respect, that of Breslau, contains 942,307 inhabitants. A government is under the control of a president and a number of counsellors and assessors, who have the charge of every thing except the administration of justice. Each province has a high-president. The ten provinces are as folllows :—

	Inhabitants in 1828.
Brandenburg,	1,539,602
Pomerania,	877,555
Silesia,	2,396,551
Saxony,	1,409,388
Westphalia,	1,228,544
Cleves-Berg,	1,075,025
Lower Rhine,	1,127,297
East Prussia,	1,216,154
West Prussia,	792,207
Posen,	1,064,506

Neufchatel has 51,580. Though the geographical character and financial resources of Prussia were much improved by the peace of Paris, the first still gives rise to many inconveniences. Prussia has an unguarded frontier from Seidenberg, in Upper Lusatia, to Wittichenau ; an open frontier towards Russia (as a Russian army may, at any time, come within three days' march of Breslau, and to fortify the Prosna would cost millions), and her Rhenish provinces compel her to keep up always a strong military force in the direction of France—all which shows, if we may use the phrase, the artificial existence of Prussia, her unnatural position. Prussia can only partially overcome these disadvantages by immense expense ; and nothing but the establishment of a general government for the whole of Germany can afford an adequate barrier against the threatening power of Russia. Prussia, which has but a third part of the population of France, has yet 712 miles more of frontier. At one extremity she touches the gates of the French fortress Thionville on the Moselle, while the other is watered by the Memel and the Niemen, and we seek in vain for a body to unite the two arms, which are connected only by the double military road running through Hanover. There are, properly speaking, three Prussias, one in Poland, one in Germany, one between the Meuse and the Rhine. The kingdom has three vulnerable parts, towards Russia, Austria, and France ; hence its situation is dependent.

The commerce is various, yet would be much greater if those countries which now form Prussia formed part of one great state, comprising all Germany, because her trade with the interior of Germany is now obstructed. The Prussian territory extends 522 miles on the Baltic, and has several bays and ports. Its inland trade is promoted by the rivers Oder, Vistula, Elbe and Saale (the two latter of which are connected by seven canals with the two former), the Rhine, and also the Memel, Pregel, Warta, Netze, Havel, Spree, Weser, Ems, Ruhr, Lippe and Moselle, which either flow through Prussia, or belong entirely to it. There are rich lands along the banks of most of these rivers. The mineral treasures of the country, which are considerable, with the exception of the nobler metals, are much wrought. Amber is found almost exclusively on the coast of Hinder Pomerania and East Prussia. Cattle of all kinds are raised ; horses are bred chiefly in East Prussia. Agriculture and the raising of sheep (Prussia has more than 15,000,000 of sheep) have attained a high degree of perfection. Manufactures are carried on in the mountainous part of Silesia, in Ravensberg, the Mark, Berg, and the other Rhenish provinces, chiefly of articles of domestic production ; for example, manufactures of linen, amounting, in Silesia, annually to 11,000,000 of Prussian dollars (above 7,400,000 Spanish), of wool (in Silesia, Brandenburg, Saxony, the Lower Rhine, Aix-la-Chapelle, Burtscheid, Stolberg, &c.), and manufactures of various kinds of hardware. Iron and steel wares are largely made at Berlin, Solingen, Remscheid, Iserlohn. The value of all these manufactures was estimated, in 1804, at 51,000,000, and, including all sorts of articles for consumptions, at more than 85,000,000 of Prussian dollars,* and that year may be taken as a standard. Dantzic, Stettin, Konigsberg, Memel, Elbing, Pillau, Colberg, Stralsund and Swinemunde (q. v.) are seaports, some of them not unimportant. Though Prussia employed many thousand sailors before the introduction of the continental system, yet it has no navy to protect its commerce ; and some forced attempts of the government to carry the Prussian flag to distant parts of the world, have by no means tended to the benefit of commerce. By a law of September 21, 1821, a small coin (silver grosh), of which thirty make one Prussian dollar, was introduced. Government gain by it fourteen per cent.

Most of the inhabitants of Prussia are Lutherans: the reigning family are Calvinistic. In 1824, the king introduced a new liturgy, which, in 1825, 5343 of the 7782 evangelical churches in the Prussian monarchy had accepted. According to the concordate with the pope, in the bull *De Salute Animarum*, of July 16, 1821, the bishops of Munster, Treves and Paderborn are under the archbishop of Cologne, and the bishop of Culm is under the archbishop of Gnesen and Posen. The bishoprics of Breslau and Ermeland are under no archbishop. The eight chapters elect their bishops ; the pope confirms the election, and the chapters inquire, before the election, whether the persons proposed for their votes would be agreeable to the king. The members of the chapters are elected by the pope in the months one, three, five, seven, nine, eleven ; in the other months by the bishop. In the first case, respect is paid to the wishes of the king ; in the latter, the election is subject to the royal confirmation. The following orders of knighthood exist in Prussia : the order of the Black Eagle, founded in 1701, at the coronation of Frederic I., consisting of but one class ; the order of the Red Eagle, originally an order of the house of Anspach and Baireuth, and confirmed in 1791, by Frederic William II., and, in 1810, divided into three classes ; the Louisa order, founded in 1814, for females ; the order of Merit, founded in 1740 ; that of the Iron Cross, with two classes, for those who fought in the campaigns of 1813—15 ; the order of St John, besides various other honorary designations, medals, crosses, &c. In 1823, the king established provincial estates both where they had previously existed, and where they had not. This was to pass for a fulfilment of his promise made in 1815, to give a constitution to his people, but was, in fact, an evasion and a mockery. The estates consisting of nobility, citizens and peasants, have the right to give their opinion when they are consulted, and in questions relating to taxation, they are always to be consulted ; but in no case is their opinion binding on the government.

Though Prussia is an absolute monarchy, all persons are equally subject to the laws, and justice is impartially administered (except in the case of accusations for political offences); all are equally bound to do military duty, and the way to office is nominally open to all. Feudal services were abolished or rendered redeemable by the edict of Oct. 9, 1807, which must be considered as a consequence of the principles introduced by the French revolution. The internal organization of the state rests on the edict of October 9, 1707, and the administration was settled by the law of April 30, 1815. A general presides over each military division, and a high president (*oberprasident*) over each province. The conduct of public affairs belongs to the governments; the administration of justice to the high courts of the country (*Oberlandesgerichte*). Each "government" has a president and two chief divisions, the first of which attends to the police, the estates, the military, and the general affairs of the government, and is under the minister of the interior. The second division, under the minister of the police, has the charge of all financial affairs. Each province is divided into circles, superintended by a counsellor (*Landrath*), the organ of both divisions. The high presidents are permanent deputies of the ministers. To them are intrusted all those matters of political regulation, whose effect cannot be restricted to a single government; in particular, they are the presidents of the consistorial and medical authorities, and, at the same time, presidents of the government in the capital of the province. At the head of the state stands the monarch, who issues through his "privy cabinet" cabinet orders, signed by himself. March 30, 1817, a council of state was established: it is the highest deliberative authority, but has no part in executive business. It examines all plans, proposals, grievances, &c. The king presides, or the chancellor of state, or a member temporarily substituted. In 1819, this council consisted of sixty-six persons, including the princes. Under the "ministry of state" (consisting of the prince-royal, nine ministers of state and six reporting counsellors) stand immediately the privy state and cabinet archives, the high committee of examination, and the board of statistics. The ministry of state consists of, 1. the ministry of the royal household; 2. of foreign affairs; 3. of justice; 4. of finances; 5. of manufactures, commerce and public works; 6. of the army; 7. the interior and the police; 8. of ecclesiastical affairs, education and health; 9. of accounts (*Staatsbuchhalterei*.) Independent of these is the general post-office. The general directory of foreign commerce has formed a separate department since 1820. The same is the case with the chief bank at Berlin. (For the Prussian law, and the administration of justice, see the end of this article.) The Prussian government has fulfilled its pecuniary obligations with scrupulous exactness: thus it behaved honourably in its new provinces to the public creditors, who were so long ill-treated under the confederation, and acknowledged the whole debt in Westphalia, which had been reduced to a third by the king of Westphalia. The reigning house in Prussia is the house of Hohenzollern.

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* A Prussian dollar is equal to about 2s. 8d. of our money.

History of Prussia. The Teutonic knights received, in 1226, a strip of land on the Vistula from Conrad of Masovia (see *Poland*), in order that they might protect Poland from the heathen inhabitants of Prussia. From 1230 to 1283, they carried on a war of extermination with eleven Prussian tribes. These at last became Christians, and adopted the German customs. The power of the Teutonic knights increased rapidly, and, in the fifteenth century, their territory extended from the Oder, along the Baltic, to the bay of Finland, and contained cities like Dantzic, Elbing, Thorn, Culm, &c. About 1404, they ruled over 2,500,000 of people, and had an annual income of 800,000 marks. But the knights became tyrants, and the nobility and cities had no means of escaping their oppression but by submitting to Poland. A terrible war ensued, from 1454 to 1466, and the country was filled with bloodshed and devastation. It 1511, the knights elected Albert of Brandenburg, son of the margrave of Anspach, to the office of grand master, with a view of strengthening themselves. In 1525, the order was abolished entirely in Prussia, and its territory was converted into an hereditary duchy, under prince Albert and his male descendants or brothers, as a fief of Poland. The republic of Poland acknowledged the sovereignty of the elector of Brandenburg in the duchy of Prussia by the treaty of Welau, September 19, 1657. Towards other powers, and especially Sweden, the great elector Frederic William also maintained a respectable attitude. His son Frederic III. placed the royal crown upon his head, January 18, 1701, as Frederic I., thereby elevating Prussia Proper to a kingdom. Vanity probably led him to take this step, but, under him, the monarchy increased in territory, and a desire for further increase—a necessary consequence of the scattered condition of its component parts—and the assumption of a station which required augmented power to support it—became an early, and, it may be said, a ruling trait of Prussian policy, and the desire is still strong, for the original motive still remains. Frederic William I. (q. v.) received Stettin in 1720, by the peace of Stockholm, and also Prussian Guelders. He was a tyrannical soldier, but sagacious, a friend of justice when it did not interfere with his caprices or plans. His desire to keep on foot a standing army of 60,000 men, led him to the enlisting of foreigners. He was frugal, and under him began the system so much developed by Frederic II., of making the internal government as much as possible a machine. His love of justice not unfrequently led him to infringe the independence of the judiciary. With many resources which waited only for development, Prussia came to Frederic the Great, who made it one of the first powers of Europe. Claims upon parts of Silesia were used as a pretext for the invasion of that province. After several wars, he remained in possession of the chief part of it. East Friesland was united with Prussia in 1743. From the year 1763, Frederic's chief care was directed to the internal government, almost all the branches of which he improved; but the great number of troops which he kept on foot induced him to make the increase of revenue the chief object of his government, and the whole system of internal administration was regulated with a view to make it a productive machine. Square miles and population were then the measure of power and happiness in the policy of the European cabinets; the first partition of Poland, in 1772, was the consequence; and, from that time, Prussia sacrificed Poland to Russia to secure its aid as an ally against Austria. The monarchy was almost doubled under Frederic the Great. He left to his nephew, Frederic William II., a territory of 71,760 square miles, with 5,800,000 inhabitants, and an army of 220,000 men (which, however, consumed almost four fifths of the revenue of the state), and a treasure of 50 million Prussian dollars (about 34 million Spanish). Frederic the Great had no true love for his nation; his ruling passions were the love of fame and of power. He regarded the Prussian nation as a foreign general regards the army under his command. More than any other prince he undermined the German empire, which, it must be owned, had become worse than worthless. He separated entirely the army and the citizens—a system whose natural termination was the punishment of an insolent nobility on the field of Jena. Under his government industry was encouraged; the press enjoyed considerable liberty; Frederic was, in general, a lover of justice. With him died the principle which had given motion to the whole system, and Mirabeau, in his *Histoire secrète*, calls Prussia *pourriture avant maturité*. His successor, Frederic William II., was a profligate and weak man; the country was badly governed; the finances exhausted, and her politics became wavering, because Frederic the Great had elevated her to such a rank among the European states, that she was obliged to take a prominent part in the most important affairs of the continent; but after she had lost the aid of his genius, she had not sufficient power to act independently. This wavering character continued for a long series of years. With Frederic the Great, also, or, at least, under him, began a singular contradiction in Prussian politics. While her government promotes with great liberality the diffusion of knowledge, and manifests a real enthusiasm for science, and several of her most eminent public men are among the friends of free institutions, yet history finds her siding with Russia, and, of late, also, with Austria, all three opposing with a vain obstinacy the irresistible progress of liberty. At Reichenbach, in 1790, Prussia appeared as mediator in the peace with the Porte, and in August, 1791, became connected again with the court of Vienna by the convention of Pilnitz. The profligate extravagance of the court of Frederic William II. required large supplies of money; and Prussia and Russia seized upon the remainder of Poland, under the pretext of putting down Jacobinism, although Frederic William had assented to the new Polish constitution of May 3, 1791. The cabinet, which surrounded the imbecile king, was without principle; it took possession of the territory of Nuremberg; it shared, in 1793 and 1795, in the partitions of Poland, and made a secret treaty (August 5, 1796) with France. After many inconsistent steps caused by her artificial situation, Prussia resolved upon the maintenance of a strict neutrality, which, in the state of Europe at that time, was impossible. In 1803, France occupied Hanover. In 1805, when a third coalition was forming against France, Prussia wavered more than ever. The emperor of Russia, Alexander, appeared at Berlin, and brought about the convention of Potsdam, November 3, 1805; but, after the battle of Austerlitz, Prussia sought for peace, and concluded with France the treaties of December 15, 1805, at Vienna, and of February 15, 1806, at Paris. April 1, 1806, she was obliged to occupy Hanover, and was severely reproached by Fox. After Napoleon had concluded the confederacy of the Rhine, Prussia thought herself called upon to form a counterpoise against France; but she could not effect a confederacy of the states of Northern Germany. A war ensued, and a single battle—that of Jena, October 14, 1806—disclosed to the world the rottenness of the system of Frederic the Great (to rest the whole power of the state on the army, and to separate the army as much as possible from the citizens, by taking for soldiers foreigners, and for officers noblemen only, whose arrogance has never been surpassed, and had no solid basis, not even that of large property). The peace of Tilsit, July 9, 1807, reduced Prussia to half its former dimensions, and this half had to support 150,000 French soldiers until December, 1808, and to pay 120 millions of francs; French garrisons remained in the fortresses of Stettin, Kustrin and Glogau. The minister Von Stein (at the head of affairs since October 5, 1807,) strove to regenerate Prussia, and, though he was a most uncompromising enemy of France, established by the edict of Oct. 9, 1807, new relations between the landlords and the cultivators, and introduced several results of the French revolution. The peasants were to be in future free, and might become owners of the soil; and November 19, 1808, a municipal constitution, called the *Stadteordnung*, was established, by which the minister Stein seems to have intended to lay the foundation of a civil spirit, and to adapt the state of Prussia to the spirit of the age.* In 1808, Stein was obliged to leave Germany, in consequence of the persecutions of the French. June 6, 1810, baron Hardenberg was placed at the head of the government as state-chancellor. His administration is a most important one for Prussia. (See *Hardenberg*.) The continuance of French oppression, instead of weakening Prussia, strengthened her to a degree which would have been thought impossible. Her energy broke forth with a wonderful effect in 1813, when the king called on "his people" to shake off the French yoke. The nation was then in a state of excitement, which the government gladly made use of, but did not understand, or, if it did understand, laboured to check as soon as the occasion for turning it to profit had passed by. We have given, in the first division, *Statistics*, &c. of Prussia, the increase which this monarchy received from the Vienna congress. Its political station is much the same as it was before 1806, though Prussia has become more influential than it was during the reign of Frederic William II., and is closely connected with Austria and Russia, and instead of rallying round her the constitutional portion of Germany, and making herself the champion of order and civil liberty in that country, she shuts her eyes to the noble opportunity, and joins to the barbarous might of Russia and the withering despotism of Austria the light of science and civilization, and thus, in case of a general war, will compel the constitutional states of Germany again to join France.

Administration of Justice in Prussia. At the head of it is the minister of justice, whose office extends to the organization of the whole department, all the appointments in the same, &c., and to decisions in cases unprovided for, and the remedying of what appears defective or contradictory by the authority of the king. Under him, in the ancient Prussian dominions, are the high courts of the country (*Oberlandesgerichte*); under these the lower courts, particularly the *inquisitoriats*, which have charge of criminal cases; the country and town courts; royal "justice-offices," courts of the mediatized princes, counts and barons, patrimonial courts; commissioners of justice (advocates) and notaries. There are also ecclesiastical and commercial courts. Since the new organization of justice in Prussia, it has always been the plan to appoint, even for courts of the first instance, several judges with collegiate power, for all cases where the question is one of real legal investigation; whereas, in former times, in Germany, there was but one judge in all the courts of the first instance. The same principle lies at the foundation of the new French organization. The judicial system in Prussia is as follows:—*A.* In the German countries between the Rhine and the Weser, the Elbe and Oder, including East Prussia, there is a considerable variety in the courts of the first instance, particularly in Silesia and Westphalia, on account of the many lordships and principalities which have independent courts of the first instance; some of them even possess courts of the second instance. In the Catholic parts of the country there are, also, the ecclesiastical courts of the archbishops and bishops. The courts of the second instance comprise sixteen high courts of the country, of which the one at Berlin is called *court of the chamber* (*Kammergericht*). These are permanent courts, and all the time in session. Every high court of the country is divided into two senates (three only excepted), of which the second forms generally the court of appeal, and at the same time attends to affairs of guardianship, &c. The division into senates exists also for criminal cases. These high courts of the country consist of 330 presidents, counsellors and assessors (all judges). Above them stands the privy supreme tribunal at Berlin, as a court of revision for important cases. Civil cases, according to the ancient German custom, pass successively through three courts, criminal cases through two; but all decisions in important criminal cases are sent to the minister of justice, and generally are laid by him before the *Kammergericht* for its opinion. For the conduct of investigations there is a division called *Inquisitoriat*, in the high courts of the country. This organization exists in East and West Prussia, Brandenburg, Pomerania, Silesia, Saxony, Westphalia, and Juliers-Cleves-Berg. *B.* The province of Posen had, during the existence of the duchy of Warsaw, a judicial organization entirely French, which, with certain modifications, has been retained by the ordinance of Feb. 9, 1817. There are in that province thirty-one courts of the peace, for much the same objects as the French courts of this sort, namely, to effect compromises, to decide in actions for the recovery of small debts, contracts of hire, insults, &c. As courts of the second instance for cases decided by the justices of the peace, and of the first instance for other cases, there are seven "country courts" (*Landgerichte*), corresponding to the French *tribunaux de première instance.* In some cases, the oral pleading has been retained in civil cases, but with an extension of the power of the judge, and a curtailing of the irregular writing, which the French process permits to the advocates. (See *Process.*) For criminal cases there are four inquisitoriats, entirely in the Prussian form. A high court of appeal at Posen, with two presidents and eight counsellors (judges), forms the court of highest instance in all cases. The first appeal is made from one country court to another; so that these courts exercise mutually an appellate jurisdiction over each other. The high court of appeal is not merely a court of cassation (q. v.), but goes into a consideration of the whole case, and decides it upon the merits. The courts of the peace consist of a judge and an assessor (assistant). The country courts comprise sixty-two presidents, directors, counsellors and assessors. *C.* In the province of the Lower Rhine, the French administration has been retained entirely, as well in respect to the organization of the courts as to the nature of the process. (Only the Eastern Rhenish part of the district of the country court of Coblentz has the Prussian organization.) In this province, there are 123 courts of the peace. Above them stand six country courts, with ninety-one presidents, counsellors and assessors. The court of second instance (in regard to courts of the peace, the third) is the Rhenish court of appeal, with two presidents, twenty-six counsellors, and two assessors. There are in these courts, collectively, thirty-three advocates of the crown. At Aix-la-Chapelle, Coblentz, Cologne, Crefeld, Elberfeld and Treves are commercial courts. Appeals of cassation (q. v.) go to the court of cassation at Berlin. *D.* The principality of Neufchatel and Valingin has its own ancient judicial system. The lower judicial authorities are the mayors and castellans; the higher are two sovereign courts, in which the governor presides, and to which each estate (nobility, officers and communities) sends four members. The supreme tribunal at Berlin is the highest court of justice for that part of the Prussian monarchy, in which the Prussian judicial system prevails. It decides only as the highest court of appeal, the court of third instance, in causes in which the amount in dispute is at least 2000 German dollars, with the exception of a few kinds of cases which belong to it, without regard to the amount, and of some which are excepted from its jurisdiction, without regard to the amount. It acts only on the reports carried up to it from the lower courts, and, whenever a disputed fact remains to be settled, the cause is sent back to the inferior court. The numerous other courts, which possess final jurisdiction, have prevented this tribunal from contributing so much to give completeness and uniformity to the jurisprudence of the country, as other supreme tribunals in other countries; for example, the parliament of Paris, the court of cassation, the court of the imperial chamber, the Roman rota, &c. The regulation of the judicial system has hitherto fallen principally to the minister of justice. The supreme tribunal, in the year 1824, consisted of a president (bearing the rank of minister) and twenty counsellors, who were chosen from the most distinguished members of the supreme tribunals of all the provinces. In addition to these, there was established, in 1819, for the administration of justice in the Rhenish provinces of Prussia, a court of revision and cassation at Berlin. For the grand duchy of Posen there is a supreme court of appeal, consisting of a president and eight counsellors at Posen. Swedish Pomerania also has its old system of justice, a court of five members, and a supreme court of appeal, composed of a president and three counsellors, both established at Greifswald.

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* The *Stadteordnung* gives the cities the control of their pecuniary affairs, and, in some measure, of their police. It was revived in 1831, and extended to cities acquired since its introduction. It does not, however, confer much real liberty.

Prussian Code (*Allgemeines Landrecht*, that is, universal law of the country, called also, sometimes by foreigners, *Codex Fridericianus*). All the kings of Prussia and Brandenburg, since the elector Frederic William of Brandenburg, have zealously endeavoured to improve the system of law and legislation; but none of them have understood so thoroughly the real wants of the people, and none have had such success as king Frederic II., who was, in a great many respects, a benefactor to his country. Immediately after the conclusion of his first war, he gave to the courts a more simple and efficient constitution. The minister of justice (high-chancellor), Samuel V. Cocceji, a celebrated lawyer, began a *Corpus Juris Fridericianum*, in which the Roman law was brought into a natural order, general principles laid down and conclusions deduced, subtleties and fictions, and all rules not applicable to the state of Germany, excluded, and all doubtful laws settled (1st part 1749, 2d part 1751). But this essay embraced only a small part of the system of law; and, although it was introduced in some provinces, still the proposed end was not yet attained. After Cocceji's death (1755), his constitution of the courts fell into disuse, and the design of making a new code of laws was for the time abandoned. But, in 1780, under the superintendence of the minister Von Carmer, the formation of a new code was undertaken, and prosecuted with unceasing activity. It was not intended to make an entirely new code of laws, but to supply the defects of the existing system. The Roman law was, therefore, taken as the foundation of the work. To each passage was prefixed the place which it should occupy in the code, or the ground on which it was rejected, and whatever the new institutions made necessary was added according to the prevailing law. This code was published from 1784 to 1788, in six parts. The opinions of those who understood the subject were requested, and prizes offered for the best commentaries on it; and the whole was completed in June, 1791, under the title "General Prussian Code." Some slight faults which were pointed out having been corrected, it was promulgated June 1, 1794, under the title *Allgemeines Landrecht*. The work has, from the first, held a high rank, and only one distinguished voice has been raised against it, that of John George Schlosser, in his Five Letters on Legislation, and particularly on the Plan of the Prussian Code (Frankfort, 1789—90, 2 parts), which, on the whole, take the same ground as Von Savigny has lately done (*Ueber den Beruf unserer Zeit zur Gesetzgebung*, Berlin, 1815),[*] opposing all modern codes. The reforms which have been effected since 1808 have greatly added to its value, and the efforts for its improvement are still continued. Among the commentaries should be distinguished F. H. von Strumbeck's Supplement to the General Code for the Prussian States (Leipsic, 1824, 2 vols.).

Prussia Proper includes the two provinces of East and West Prussia. East Prussia is mainly made up of the former duchy of Prussia, and West Prussia is a part of Poland, which was taken in the partitions. Konigsberg is the capital of East Prussia. Dantzic and Marienwerder are the most important places of West Prussia.

PRUSSIAN BLUE. See *Blue, Prussian*, and *Prussic Acid*.

PRUSSIC ACID, or HYDROCYANIC ACID, is procured by the following process: To a quantity of powdered prussian blue, diffused in boiling water, let red oxide of mercury be added in successive portions, till the blue colour is destroyed. Filter the liquid, and concentrate till a pellicle appears upon its surface. On cooling, crystals of prussiate (or cyanide) of mercury will make their appearance. These, after drying, are put into a tubulated glass retort, to the beak of which is adapted a horizontal tube, about two feet long, and fully half an inch wide at its middle part. The first third part next the retort is filled with small pieces of white marble, the rest with fused muriate of lime. To the end of this tube is adapted a small receiver, which is immersed in a freezing mixture. Pour on the crystals in the retort, muriatic acid in rather less quantity than is sufficient to saturate the oxide of mercury which formed them. Apply a very gentle heat to the retort. Prussic acid will be evolved in vapour, and will condense in the tube. Whatever muriatic acid may pass over with it will be detained by the marble, while the water will be absorbed by the muriate of lime. By means of a moderate heat applied to the tube, the prussic acid may be made to pass successively along; and, after having been left some time in contact with the muriate of lime, may be driven over into the receiver. As the carbonic acid, evolved from marble by the muriatic, is apt to carry off some of the prussic acid, care should be taken so as to prevent the distillation of this mineral acid. Prussic acid, thus obtained, has the following properties: it is a colourless liquid, possessing a strong odour, somewhat resembling that of peach blossoms; and the exhalation, if incautiously inhaled, may produce sickness or fainting. Its taste is cooling at first, then hot, asthenic in a high degree, and a true poison. Its specific gravity, at 44½°, is 0.7058; at 64°, 0.6969. It boils at 81½°, and congeals at about 3°, becoming crystallized with the fibrous form of nitrate of ammonia. The cold which it produces, when reduced into vapor, even at the temperature of 68°, is sufficient to congeal it. This phenomenon is easily produced by putting a small drop at the end of a slip of paper, or a glass tube. Though repeatedly rectified on pounded marble, it retains the property of feebly reddening paper tinged blue with litmus. The red colour disappears as the acid evaporates. The vapor of prussic acid is 0.9476. It was analyzed by Gay-Lussac by passing it through an ignited procelain tube, containing coils of fine iron wire. No trace of oxygen could be found in it. The result was as follows:—

Carbon,	44.39
Nitrogen,	51.71
Hydrogen,	3.90
	100.

This acid, when compared with other animal products, is distinguished by the great quantity of nitrogen it contains, by its small quantity of hydrogen, and the total absence of oxygen. When this strong acid is kept in well-closed vessels, even though all access of the air is prevented, it sometimes undergoes decomposition in less than one hour. It begins by assuming a reddish-brown colour, which becomes deeper and deeper, until at length it deposits a carbonaceous matter, which gives a deep colour to both acid and water, and emits an odour like that of ammonia. When potassium is heated in prussic acid vapour, mixed with hydrogen or nitrogen, there is absorption without inflammation, and the metal is converted into a gray, spongy substance, which melts, and assumes a yellow colour. Supposing the quantity of potassium employed capable of disengaging from water a volume of hydrogen equal to fifty parts, we find, after the action of the potassium, that the gaseous mixture has experienced a diminution of volume amounting to fifty parts. On treating this mixture with potash, and analyzing the residue by oxygen, we find that fifty parts of hydrogen have been produced, and, consequently, that the potassium has absorbed 100 parts of prussic acid vapour; for there is a diminution of fifty parts, which would obviously have been twice as great, had not fifty parts of hydrogen been disengaged. The yellow matter is prussiate of potash, properly a cyanide of potassium, in analogy with the chloride and iodide of potassium, formed when the vapour of muriatic and hydriodic acid is made to act upon potassium. The base of prussic acid thus divested of its hydrogen, to which it owed its acidifying quality, is called *cyanogen* by Gay-Lussac, in allusion to its being the basis of the blue colour of prussian blue. It is obtained by heating the cyanide of mercury in a small glass retort. It soon blackens, and melts like animal matter, at the same time disengaging the cyanogen in abundance. This substance, which is the true radical of the acid under consideration, is possessed of the following properties: It is a permanently elastic fluid, of a strong and penetrating odour, and a density, when compared with air, of 1.8. It is inflammable, and burns with an intensely beautiful bluish flame, bordering on purple. It consists of nitrogen 29.654, and carbon 25.418, and is, therefore, a bicarburet of cyanogen. Though a compound body, it has a remarkable tendency to combine with elementary bodies. Thus it is capable of uniting with the simple non-metallic bodies, and evinces a strong attraction for the metals. It enters into direct combination with a few alkaline bases only, and these compounds are by no means permanent; hence it has no claim to be considered as an acid. To return to the properties of prussic acid, before we describe the other compounds of cyanogen. Barytes, heated in prussic acid, yields its barium to the cyanogen of the acid to form a cyanuret of barium, while the hydrogen of the acid and the oxygen of the earth unite to form water. Potash and soda behave in a similar manner, as respects their bases. Prussic acid is the most violent of all poisons. When a rod dipped into it is brought in contact with the tongue of an animal, death ensues before the rod can be withdrawn. Doctor Magendie has, however, introduced its employment into medicine. He found it beneficial against phthisis and chronic catarrhs. His formula is the following: Mix one part of the pure prussic acid with 8½ of water by weight. To this mixture he gives the name of *medicinal* prussic acid. Of this he takes 1 *gros* or 59 grs. troy, distilled water 1 lb., or 7560 grs., pure sugar 1½ oz., or 708¾ grs., and, mixing the ingredients well together, he administers a table-spoonful every morning and evening. One ten thousandth of prussic acid may be detected in water, by the addition of a few drops of solution of sulphate of iron. This test, though delicate, is surpassed by another, in which copper is used, and which will detect one twenty thousandth of prussic acid in water. To employ it, we must render the liquid containing the prussic acid slightly alkaline with potash, add a few drops of sulphate of copper, and, afterwards, sufficient muriatic acid to redissolve the excess of oxide of copper. The liquid will appear more or less milky, according to the quantity of prussic acid present. Prussic acid is formed in a great many chemical operations; as, for instance, by transmitting ammoniacal gas over ignited charcoal contained in a tube; as also by heating in a glass tube, closed at one end, a mixture of oxalate of ammonia and oxalate of manganese. Prussic acid exists in the vegetable kingdom. The peculiar smell of bitter almonds, peach flowers, and the leaves of the *lauro-cerasus*, and of other vegetables, is owing to this substance. Prussic acid is often obtained from the peach and apricot kernels. The bark of the ***prunus padus*** contains much of it, and water distilled from it is capable of killing animals. Cyanogen unites with oxygen, and gives rise to a compound called *cyanic acid.* It consists of cyanogen twenty-six parts, and oxygen sixteen. It crystallizes in oblique rhomboidal prisms, which are colourless and transparent, insoluble in cold water, but are dissolved in hot water, as well as in the strong acids. Its most remarkable property is, that it allows of being boiled with the strong acids without undergoing decomposition or change. With the metalic oxides it forms salts that do not detonate. The cyanous acid contains just half as much oxygen as the cyanic, and is characterized by the facility with which it is resolved by water into carbonic acid and ammonia, and by the property of detonation, when in union with the oxides of mercury and silver. It is, in fact, the same substance as the fulminic acid, which is essential in the fulminating compounds of these metals. (See ***Fulmination***, and ***Fulminating Silver***, and ***Mercury***, under these metals respectively.) We have also two compounds of the radical of prussic acid with chlorine, called the ***chloride of cyanogen***, and the ***bichloride of cyanogen***. The former of these is solid at 0 of Fahr. Between 5° and 10° 5′, it is liquid, and also at 68°, under a pressure of four atmospheres, but, at the common pressure and temperature, it is a colourless gas. In the liquid state, it is as limpid and colourless as water. It has a very offensive odour, irritates the eyes, and is highly injurious to animal life. It consists of thirty-six parts chlorine and twenty-six of cyanogen. The bichloride of cyanogen contains twice as much chlorine as the preceding compound. It is solid at common temperatures; at 284° it fuses, and boils at 374°. Its vapour is acrid, and excites a flow of tears, and is injurious to life. Its odour is similar to that of chlorine. When boiled in water, it is converted into muriatic and cyanic acid. There is a compound of iodine and cyanogen of somewhat similar properties. It has a caustic taste and a penetrating odour. It is very volatile, and sustains a temperature above 212°, without decomposition. ***Bromide of cyanogen*** has also been formed, and resembles the last mentioned compound. Cyanogen forms an acid compound by a union with hydrogen and iron. It is neither volatile nor poisonous in small quantities, and is destitute of odour. It is gradually decomposed by exposure to the light, forming prussic acid and prussian blue. It decomposes some salts of the more powerful acids: peroxide of iron, for example, unites with it in preference to sulphuric acid, unless the latter is concentrated. As the acid contains no oxygen, but simply consists of carbon, hydrogen, nitrogen and metallic iron, the name of *ferrureted chyazic acid* (*chyazic*, from the initials of *carbon*, *hydrogen* and *azote*) has been proposed, but the term *ferro-cyanic acid* is more generally employed. Of the salts formed by this acid, the most important in chemistry is the *ferrocyanate of potash* (formerly called the ***prussiate of potash***). It is transparent, and of a beautiful lemon yellow colour. In large crystals, it possesses a certain kind of toughness, and in thin scales, a degree of elasticity. Its solution is not affected by alkalies, but it is decomposed by almost all the salts of the permanent metals. The following table presents a view of the colours of the metallic precipitates thus obtained.—

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[*] This work of Mr. von Savigny, whose objections against the aptitude of our time, not to make, but to compile codes, we by no means share, nor even consider very profound, is, nevertheless, highly interesting, as might have been expected from the reputation of the author. We recommend its perusal with reference to the history of the code here in question. It sets in a striking light the extreme care with which the Prussian code was drawn up, in which respect it is much distinguished from the French and Austrian codes. Savigny's work has been translated under the title On the Aptitude of the present Age for Legislation and Jurisprudence, by a Barrister of Lincoln's Inn (London).

Solutions of	Give a
Manganese	White precipitate.
Protoxide of iron	Copious white.
Deutoxide of iron	Copious clear blue.
Tritoxide of iron	Copious dark blue.
Tin	White.
Zinc	"
Antimony	"
Uranium	Blood red.
Cerium	White.
Cobalt	Grass green.
Titanium	Green.
Bismuth	White.
Protoxide of copper	"
Deutoxide of copper	Crimson brown.
Nickel	Apple green.
Lead	White.
Deutoxide of mercury	"
Silver	" passing to blue in the air.
Palladium	Olive.
Rhodium, platina and gold	None.

Iron, though contained in the ferrocyanic acid and all its salts, cannot be detected in them by the usual tests of iron; for the liquid tests are fitted only for detecting oxid of iron as existing in a salt, and therefore cannot be expected to indicate the presence of metallic iron, while forming one of the elements of an acid. The beautiful dye, called ***prussian blue***, is a *ferrocyanate of the peroxide of iron*, and is always formed when ferrocyanic acid or its salts are mixed in a solution with a persalt of iron. The usual mode of manufacture is by mixing together one part of the ferrocyanate of potash, one part of copperas and four of alum, each previously dissolved in water. Prussian blue, mingled with more or less alumine, precipitates. It is afterwards dried on chalk stones in a stove. The ferrocyanate of potash employed in the process is prepared by heating to redness dried blood, or other animal matters, with an equal weight of pearl-ash, until the mixture has acquired a pasty consistence. The *sulphocyanic acid* is a compound of cyanogen, sulphur and hydrogen. Cyanogen forms two compounds with sulphur alone, and one with selenium.

PRUTH; a river of Europe, which rises in Galicia, in the Carpathian mountains, and empties into the Danube below Galacz. By the treaty of Bucharest between Russia and the Porte (May 6, 1812), the Pruth, from its entrance into Moldavia, was recognised as the boundary of the two empires, and all that part of Moldavia lying on the left bank, was ceded to Russia. In 1711, Peter the Great (see *Peter I.*), after three days' disadvantageous fighting on the Pruth, was surrounded by the Turkish forces, and extricated only by a treaty, concluded through the prudence and promptitude of the empress. (See *Catharine I.*) By the treaty of Adrianople (September, 1829) it was stipulated that the Pruth should continue to form the boundary between the Russian and Turkish territories.

PRYNNE, William, a learned lawyer and antiquary, was born at Swanswick, in Somersetshire, in 1600, and was placed at Oriel college, Oxford, where he was graduated bachelor of arts, in 1620. He then removed to Lincoln's-inn to study the law, and became barrister, bencher, and reader of that society. His attendance upon the lectures of Dr Preston, a distinguished Puritan, strongly attached him to that sect, and he began to write as early as 1627, attacking the drinking of healths, love-locks, popery, and Arminianism, which he deemed the enormities of the age. In 1632, he published his work against theatrical exhibitions, entitled *Histrio-Mastix;* which, although licensed by archbishop Abbot's chaplain, yet, in consequence of some reflections upon female actors, that were construed to be levelled at the queen (who had acted in a pastoral after the publication of the work), brought a persecution upon the author in the star-chamber, which condemned him to a fine of £5000, to be expelled the university of Oxford and Lincoln's-inn, to be degraded from his profession of the law, to stand twice in the pillory, losing an ear each time, and to remain a prisoner for life. Prynne continued writing against prelacy in prison; until, for a virulent piece, entitled News from Ipswich, he was again sentenced by the star-chamber to a fine of £5000, to lose the remainder of his ears in the pillory, and to be branded in each cheek with the letters S. L. (seditious libeller). This sentence was also executed, and he was removed for imprisonment to Caernarvon castle, and afterwards to the island of Jersey. His spirit was not, however, to be subdued, and he continued to write until the meeting of parliament in 1640, when, being chosen representative for Newport in Cornwall, the house of commons issued an order for his release. He entered London, with other sufferers, in triumphant procession, and petitioned the commons for damages against his prosecutors. On the impeachment of Laud, he was employed as chief manager of the prosecution, and, when the parliament became victorious, was appointed one of the visitors to the university of Oxford, where he laboured strenuously to advance the cause of Presbyterianism. He warmly opposed the Independents when they acquired ascendency, and used all his influence to produce an accommodation with the king, being one of the members who were excluded and imprisoned on that account. With the other excluded members, he resumed his seat in 1659, and displayed so much zeal for the restoration, that general Monk was obliged to check his impetuosity. He sat in the healing parliament as member for Bath, and on the restoration was appointed to the office of chief keeper of the records in the Tower. He occupied his later years in writings connected with his office in the Tower, and finished his life at his chambers in Lincoln's-inn, in 1669. Prynne was a man of extensive learning and indefatigable industry, but wanted genius and judgment. His works, of which Wood has given a catalogue, amount to forty volumes, folio and quarto, the most valuable of which is his Collection of Records (3 vols., folio).

PRYTANEUM; the building in Athens, in which the Prytanes (those senators who presided in turn) held their meetings, and lived at the public expense during the thirty-five or thirty-six days of their presidency. The liberty of eating in the Prytaneum was one of the highest marks of honour, and was conferred only on those who had done important service to the state. Napoleon established a school in Paris under the name of the *prytanée*, in which some hundreds of scholars were educated, mostly at the expense of the state. They were educated together until they were twelve years old, when they were trained for civil affairs (for which there were five professors), or for the military service (for which there were three professors). At the age of fifteen years, they left this institution, for the purpose of completing their education in other seminaries.

PSALM; in general, a song; in a narrower sense, a sacred song (from the Greek ψαλλειν, to play on a stringed instrument, to sing). *Psalm* is used particularly to denote the sacred songs which are contained in the collection of religious lyric poems in the Old Testament. They are mostly of the time of David, or of a later period, one only, perhaps (the ninetieth, the psalm of Moses), being of more ancient date. (See *Hebrew Literature.*) David, who arranged the temple music, not only appointed from the Levites a considerable number of singers and musicians, but also composed for the divine worship sacred songs, which served as a model for many others. Several of the psalms that bear his name are not, indeed, written by him, but only composed in his manner, and therefore called by his name. Seventy-one, in particular, are ascribed to him, but some, even of these, are evidently of a later date. On the other hand, the contents and style of some which do not bear his name, and the superscriptions of which have, perhaps, been lost, show him to have been the author. To his times belong most of the psalms attributed to Asaph, Heman, and Ethan or Jeduthun. Twelve psalms bear Asaph's name, of which several show traces of a later origin. Asaph, son of Berachiah, was a Levite, and (1 Chron. xvi. 5) the first of the chief musicians appointed by David for the divine worship. The name of Heman is attached to one only (the eighty-eighth psalm). Heman, surnamed the Ezrahite, seems to have been a Levite, and is named among the chief singers of David. Some of the Psalms were composed by Solomon, who, according to the First Book of Kings (iv. 32) wrote "a thousand and five songs," but whose name is affixed, in our collection, to two only (the 72d and 127th), and of these the first seems rather to have been written for Solomon than by him. But, on the other hand, some others, of unknown authors, may be his; several are at least of his time, and refer to events of his reign—the consecration of the temple, &c. The opinion that some psalms are of the time of Samuel, and written by the prophet himself, is supported by no historical testimony, but is not improbable. Most of those by unknown authors seem to be of later date; some few apparently belong to the reigns of the kings immediately succeeding Solomon, several to the mournful days of the Babylonish captivity and of the return, especially those headed "for the sons of Korah," most of which are probably by the same author. Of later date also are probably those called "songs of the degrees," which some have referred to the return from Babylon, others to the annual pilgrimages to Jerusalem and the temple, and which others suppose to have been sung on the steps of the temple. Finally, a few seem to belong to the age of the Maccabees. The psalms of David, whether actually composed by him, or merely of his time, probably constituted an earlier collection, which extended to the seventy-second. Those which follow are, for the most part, more modern. Our collection consists of 150 psalms, but the manuscripts are not all numbered alike. The Septuagint and Vulgate unite the ninth and tenth, and the 104th and 105th, while they divide the 116th and the 147th into two, so that their number differs in some respects from that of the English translation. The Masorites, without any sufficient reason, divided the whole collection into five books.

The Psalms are lyric poems, chiefly odes, and didactic, elegiac or idyllic. (See Lowth's *Hebrew Poetry*.) Most of them are in the form of prayer, or begin or end with prayer; and, whether they utter complaint, lamentation, or consolation, are expressive of the deepest trust in God. They are among the highest and sublimest efforts of poetry; and the holy light of revelation, the inspiring belief in the eternal true God, spreads over them a bright splendour, and fills them with deep fervour. They must not be compared with the other lyric productions of the ancient world; they are altogether the peculiar growth of the holy land, where the voice of revelation resounded most loudly, and was preserved the most purely. Many of their allusions are historical, and must be explained by history; but it would be going too far to attempt to explain every thing historically; since it is evident that much is metaphorical, some, though a smaller portion, allegorical, and much prophetical, referring to the future, rather than to the past. Some, on account of their local allusions, are less instructive to us; but most of them are rich in encouragement, consolation, filial trust, joyful confidence in God, evidences of humility and patience, and are well adapted for the sacred songs of Christians. It may be added that the collection in the Old Testament by no means contains the whole treasure of Hebrew psalms. Not only are the songs of Solomon lost, but there are many others mentioned in the Old Testament which are not in our biblical collection.

PSALMANAZAR, George, the assumed name of a man of letters, who is chiefly known as a literary impostor. He was born of Catholic parents, in the south of France, in 1679. His mother, being abandoned by her husband, sent her son to a school kept by Franciscan friars; and he was afterwards placed in a college of the Jesuits. He then studied among the Dominicans, and having finished his education, acted as a private tutor. Leaving his situation, he engaged in several adventures; and, at length, having stolen from a church, where it had been dedicated, the habit of a pilgrim, he roved about in that character, subsisting on charity. He afterwards became a common vagrant, and then servant to the keeper of a tavern, whose house he left clandestinely, and, renewing his wandering mode of life, he conceived the project of professing himself to be a Japanese convert to Christianity, who had found his way to Europe. As he did not find this scheme very profitable, he adopted the character of a heathen native of the island of Formosa, and, in order to support his pretensions, he contrived a new language, which he called the *Formosan*. At this time he became acquainted with a clergyman named Innes, who, conceiving he could turn the imposture to good account, persuaded the pretended Formosan to suffer himself to be converted to the church of England; and the clergyman and his new disciple went to London, where the latter was presented to bishop Compton and others, and the former was rewarded for his zeal with church preferment. Psalmanazar had the effrontery to translate the Church Catechism into his newly-invented Formosan language; and he published a History of Formosa (1704), which passed through several editions. In the mean time he was sent to study at Oxford; and a controversy was carried on between his patrons and Dr Halley, Dr Mead, and some other less credulous persons, who refused to admit his pretensions. The imposture at length became clearly manifest; and the culprit, deserted by those whom he had deceived, was obliged to rely on the exercise of his literary abilities for his support. He settled in London, where he resided many years, and was employed by the booksellers, particularly in the former part of the Universal History, published in 1747. Towards the close of his life, he drew up an autobiographical Memoir, in which he expresses much contrition for the deceptions which he had allowed himself to practise. His death took place in 1763. Dr Johnson, who, in early life, became acquainted with Psalmanazar, always spoke with high respect of his talents and acquirements. Among all the distinguished men he had ever met, he pronounced the impostor Psalmanazar to be the most universally learned and accomplished.

PSALMODY; the art of writing or composing divine hymns or songs. The composition and performance of psalmody appears to have been practised and encouraged in Germany, France, and the Low Countries, long before it was introduced into Britain. Most of the old melodies now sung in the service of the parochial churches were set by German musicians, and it seems highly probable, from all that can be collected on the subject, that the practice of psalmody had its origin in Germany. It does not, however, appear that even in that country it at first gained admission into public worship; but it was a long time confined to family devotion, especially among the reformed. Luther, who was a good musician, is known to have regularly practised psalmody with his friends every evening after supper, and is by some supposed to have been the author of the excellent melody of the 100th psalm. The first English version of the Psalms of David, which took place soon after that of the French, was made in the reign of Henry VIII, by Thomas Sternhold (q. v.), groom of the robes to that monarch, and John Hopkins, a schoolmaster, assisted by William Whittyngham, an English divine of considerable learning. Soon after the publication of this version, vocal psalmody was introduced into the church service, and various musical manuals appeared for facilitating its practice.

PSALTER; a collection of the Psalms; also a large chaplet or rosary, consisting of 150 beads, the number of the Psalms in the Psalter.

PSALTERY, or PSALTERION; a stringed instrument much used by the ancient Hebrews, and by them called *nebel*. We know but little of the ancient form of this instrument, but have reason to conclude that it resembled that of our harp. The psaltery now in use is a flat instrument, in the form of a trapezium, or a triangle truncated at top. It is strung with thirteen wire cords, tuned in unisons, or octaves, and mounted on two bridges. It is performed with a plectrum, whence it is usually ranked among the instruments of percussion.

PSAMMETICUS. See *Egypt*.

PSARA, or IPSARA (Psyra); an island of the Grecian Archipelago, seven miles north-west of Scio, about five and a half miles in length, and as many in breadth. It consists almost entirely of a rock, thinly covered in some places with a vegetable mould. The population is about 400. It was settled about a century ago, by a little band of Greeks, who fled thither to escape the Turkish yoke, and supported themselves by fishing. In 1824, it was taken by the Turks; 600 Psariotes, the sole remnant of a population of 6000 which had perished under the Turkish scymetar, after defending themselves for a long time, in a mountain-fortress of the island, buried themselves beneath its ruins.

PSEUDO (from the Greek ψευδος, a falsehood); a term or particle prefixed to names and words, to denote any thing spurious and false. Thus we call any thing which has a false name, as a book written under a feigned name, *pseudonymous*. (See *Anonymous*.) *Pseudo-Smerdis*, the false Smerdis. See *Persia*.

PSEUDO-DEMETRIUS. See *Russia*.

PSEUDO-ISIDORE. See *Isidore*, *Decretals*, and *Popes*.

PSYCHE, the twofold signification of whose name (ψυχη, the soul, and a butterfly) added much to the effect of the beautiful allegory respecting her, was the daughter of Sol and Constancy. Apuleius makes her the daughter of a king, and relates her history thus: Psyche, whose two elder sisters were of moderate beauty, was so lovely, that she was taken for Venus herself, and men dared only to adore her as a goddess, not to love her. This excited the jealousy of Venus, who, to revenge herself, ordered Cupid to inspire her with love for some contemptible wretch. But Cupid fell in love with her himself. Meanwhile, her father desiring to see his daughter married, consulted the oracle of Apollo, which commanded that Psyche should be conveyed, with funeral rites, to the summit of a mountain, and there be left, for she was destined to be the bride of a destructive monster, in the form of a dragon, feared by gods and men. With sorrow was the oracle obeyed, and Psyche was left alone on the desert rock, when suddenly Zephyr hovers around her, gently raises and transports her to a beautiful palace of the god of love, who visits her every night, unseen and unknown, leaving her again at the approach of day. Perfect happiness would have been the lot of Psyche, if, obedient to the warning of her lover, she had never been curious to know him better. But by the artifices of her jealous sisters, whom she had admitted to visit her, contrary to the commands of Cupid, she was persuaded that she held a monster in her arms, and curiosity triumphed. As he slept, she entered with a lamp to examine him, and discovered the most beautiful of the gods; in her joy and astonishment, she let a drop of the heated oil fall upon his shoulders. Cupid awoke, and, having reproached the astonished Psyche for her suspicions, fled. After having tried in vain to throw herself into a river, she wandered, inconsolable, to all the temples, seeking every where her beloved, till she came to the temple of Venus. Here began her severest sufferings. Venus kept her near her person, treated her as a slave, and imposed upon her the severest and most trying tasks. Psyche would have sunk under the burden, had not Cupid, who still tenderly loved her, secretly assisted her in her labours. But in the last dangerous task imposed upon her, to descend to the realm of shadows, and bring away Proserpine's box of cosmetics, she almost perished. She succeeded, indeed, in the adventure; but, having opened the box, a deadly vapour issued from it, and she sunk lifeless to the earth. Cupid now appeared and the touch of his arrow restored her to life. Venus was finally reconciled; by Jupiter's command Psyche became immortal, and was for ever united with her beloved. Her marriage was celebrated with great festivities, but her envious sisters threw themselves from a precipice. Raphael has given a most beautiful representation of the marriage, in the Farnesina at Rome.

PSYCHOLOGY (from ψυχη, the soul, and λογος, doctrine); the science of the soul, or the spiritual principle in man. The object of this science is to teach the laws and relations of the changes and phenomena which take place in the mind during the intellectual operations; or to trace the causes of these phenomena, and to discover the nature of the mind and its relations to the universe; or, in short, to treat of the mind, either as it manifests itself, or as it is in itself. Investigations of the latter class, which have for their object that which cannot be discovered by observation, constitute metaphysical or transcendental psychology; while those of the former class, in which the soul becomes a subject of observation, constitute empirical or experimental psychology. Empirical psychology may, therefore, be defined to be the scientifically conducted observation of the operations and changes of the human soul. As a science, it includes all the phenomena of the intellectual activity; as the science of the soul, it forms a part of anthropology, called *psychological anthropology*, in distinction from *physiology*, or *physiological anthropology*. It takes for granted the distinction of the spiritual substance (the I, the self) from the body, as a matter of consciousness, and does not therefore attempt to explain it. It treats of the mind, indeed, in its operations and in so far as it is connected with the body, but neglects the mere physical phenomena. It is, more strictly than logic, an introduction to intellectual philosophy, since logic treats only of the laws of reason. As the development of the human mind proceeds from the particular to the general, empirical psychology is the most proper introduction to speculative philosophy; the more so, as it makes us acquainted with the spiritual instrument which philosophy employs. In this course of investigation, the subject of attention is merely facts, of which every one is conscious, and which, therefore, are intelligible by all, and of which a distinct and connected view may prevent many errors in philosophical speculation. Again, empirical psychology is *applied philosophy*; for it must not only employ the philosophical forms in the disposition and explanation of facts, but also certain metaphysical notions (as power, cause, &c.), and requires a philosophical spirit to give it the character of a science; and it is thus distinguished from a mere natural history of the soul, the development of which is prior in point of time. The latter merely records the facts in their natural order, while psychology presents them in their connexions, and according to the laws which regulate them; and in this view it is that part of applied philosophy which teaches the organization of the human soul, according to the external manifestations of its inward experience (consciousness). See *Philosophy Mental*, and *Metaphysics*.

PTOLEMAIC SYSTEM. See *System of the Universe*.

PTOLEMAIS. See *Acre*.

PTOLEMY; the common name of thirteen Greco-Egyptian kings, who reigned in Egypt, from the death of Alexander till it became a Roman province (about 290 years). They are more properly called *Lagides* (since they did not all bear the name of Ptolemy), from Lagus, the founder of the dynasty. 1. Ptolemæus Lagi (i. e. son of Lagus, a Macedonian; in reality, the son of Philip), called also *Soter*, the Saviour (by the Rhodians, on account of the assistance which he rendered them), at first governor of Egypt, reigned thirty-nine years, and died 284 B. C. He embellished Alexandria, and founded the library in that city. His son and successor, 2. Ptolemy II. (Philadelphus), a magnificent prince, is said to have founded Ptolemais and several cities, and to have built the Pharus (q. v.) which, however, is by some ascribed to his father. He died 247 B. C. 3. Ptolemy Euergetes died 221 B. C. His wife was Berenice. These three first Ptolemies were, in particular, the patrons of learning at Alexandria. (Concerning these and the other Ptolemies, see *Alexandrian School*, and *Egypt*.) Vaillant wrote a *Historia Ptolemæorum* (Amsterdam, 1701, folio).

PTOLEMY (properly PTOLEMÆUS, CLAUDIUS), geographer, astronomer, and mathematician, born at Pelusium in Egypt, A. D. 70, lived at Alexandria during the reigns of Marcus Antoninus and Adrian, and is said to have reached the age of eighty years. He is considered the first astronomer of antiquity. He corrected Hipparchus's catalogue of the fixed stars, and drew up tables for calculating the motions of the sun, moon, and planets. The scattered observations of the ancients were first collected by him, and reduced to a system, which is contained in his work Μεγαλη Συνταξις, thirteen books (Basle, 1538, fol.). The system of the world which he here exhibits is known under the name of the *Ptolemaic*. This work was translated into Arabic about 827, and from this translation, which bears the title *Almagest*, a Latin version was made by the command of the emperor Frederic II. (1230). There are also other translations of this work from the Arabic into Latin. Another important work of Ptolemy is his Geography (in eight books). He followed, in this work, the geography of Marinus of Tyre, which appeared not long before; but he enriched his work with important additions and improvements, both in regard to the latitude and longitude of places, and the boundaries of countries and provinces, and he is the first writer who sought to determine the situation of places in this way; his work also contains the first principles of the projection of maps (in Greek and Latin, with maps by Mercator, 1618). Although necessarily imperfect from want of observations, it is nevertheless important to modern geographers. Besides these principal works, we have other works of Ptolemy, on chronology and astronomy.

PUBERTY; that period of life in which childhood ceases and youth begins. It is much earlier in southern countries than in northern. In our climate, it is from the age of thirteen to fifteen in the female sex, and from fourteen to sixteen in the male, but, in individual cases, is accelerated or retarded by various circumstances. The physical and intellectual changes which manifest themselves [illegible]is epoch are highly interesting. The child is [illegible]ied and satisfied with present objects, and all [illegible] of the body appear to operate merely for the preservation of the individual, while the sexual organs, which are destined for the continuance of the species, and therefore to direct the thoughts to the future, are yet not developed for the performance of their proper functions; but, at the period of puberty, a sudden change occurs: the lively and easily-pleased boy, the gay and sportive girl, begin to appear thoughtful and reserved, and separate themselves from the childish plays in which the two sexes mingle together; the body grows more rapidly than before; the sexual parts are developed; the breasts become fuller; and, in both sexes, the voice becomes harsh and disagreeable before assuming the clear metallic tone, deep in man, high in woman, but in both very different from that of childhood. After this crisis is passed, the youth and maiden appear in all their bloom; they look upon the world as if with new senses; hope shines over the future, in which they live more than in the present; the region of the ideal opens before them, and they are eager to realize it, at the greatest efforts. This period is often attended with dangerous diseases: in some individuals it is retarded or checked in its development, by former maladies, and in this case the body is generally small and feeble, and the mind perverse; in others, it is attended with violent symptoms, which, however, may depend upon accidental causes thwarting nature in her functions. Excess of blood, inflammations, bleeding, are among the common complaints of this period, arising from the irritable state of the vascular system; or the nerves and mind are too highly excited, giving rise to epilepsy, St Vitus's dance, &c., or to mental aberrations, melancholy, enthusiasm, &c. See *Physiology*.

PUBLIC DEBT. [For the amount of the national debt of the different countries of Europe, see the table in the article *Europe*. the securities of which they consist are described in the article *Public Stocks*.] The policy of contracting public debts is good or bad, according to circumstances. In general, it is not desirable for a government, any more than for an individual, to be in debt; and yet cases will justify a nation in drawing on its future resources. In pressing emergences, taxation is not adequate to the necessary expenditures; and even if it were adequate, it may be better to distribute a part of the burthen through many successive years by means of loans, because the suddenly levying of an immense tax might check the productive faculties of the people; and no wrong is done to posterity by this, where the object of the expenditure is as important to the future as to the present, as in case of national defence or public works. We may add, that increasing the means of public expenditure usually creates demand for an increased quantity of the products of the country, and thus stimulates industry. If, for example, the government has a large army to maintain on its own territory, and the products of the country can supply it with arms, clothing, food, and all other articles, the army will be a stimulus to all the kinds of industry concerned in affording its supplies. It may even happen that the very burthen, or what seems to be one, will, in such case, enable the people in general to be better clothed, fed, and lodged, since the means of a people to produce the luxuries and comforts of life depend very materially upon the facility and rapidity of exchanges of products of different sorts of labour, and great public expenditure often creates a market by increasing consumption, and thus stimulating industry. But if the expenditure employs only the industry of a foreign country, as if an army is to be maintained abroad by the supply of articles wholly the product of foreign industry, there is no such compensation for the burthen of the tax. Another advantage of public debts is, their affording a means of investment, and thus encouraging the accumulation of property. Lands, houses, banks, canals, mines, and all other species of permanent property, afford a stimulus to industry and economy, as they offer the means of enjoying, permanently, the fruits of acquisitions, and public stocks have the same effect. Another effect of a public debt is its attaching the public creditors to the government. But before their number can be sufficiently large to make their aid important to the government, the national debt must, probably, be increased to an amount that will render it burthensome. Among the disadvantages arising from the facility of contracting permanent public debts, one is the facility which it gives for the carrying on of wars, and the indulging in any other expenditures. The wars of Europe, since the public debt of Great Britain commenced, under William III., are attributed partly to this cause. Another disadvantage is, the burthensome taxes, to which the necessity of paying the interest of such a debt, may subject the people. This is the operation of the national debt of Great Britain at the present time. It is impossible to prevent the burthen of the taxation from falling, directly or indirectly, in a very great degree, upon the labouring and active classes; and, in Great Britain, this has become so heavy to the mere labourer, who has no capital, that his wages will but just support, or will not support, himself and his family, in the cheapest manner of living; and his life becomes one desperate struggle against want and starvation.

PUBLIC LANDS.* The property of the soil of the whole vast region, comprehended within the limits of the United States of America, and not owned by the separate states or by private individuals, vests in the government of the United States. From the Atlantic to the Pacific ocean, and between the northern and southern boundaries of the republic, it is calculated that there is contained a superficies of 1,400,000,000 acres. The political situation of the different parts of this superficies is exceedingly various. Dividing it into four belts or strips, parallel (or nearly so) with a meridian line, the first comprehends the Atlantic states, in most of which, particularly in the Middle and Northern states, the land is almost wholly the property of individuals, and what does not belong to individual proprietors, belongs to the state. Thus in Maine there is a considerable portion of land belonging to the states of Massachusetts and Maine, and, in Georgia, large tracts in the occupation of the Cherokee Indians are claimed by the government of that state. The general government possesses no land in any of the Atlantic states, except small portions which have been ceded for forts, dockyards, arsenals, and other like national purposes. The second belt of land westward comprehends the new states and territories of the Union, in all of which, except Kentucky, there are considerable, in most of them large, tracts of public domain; these states having been formed since the revolution, and their population settled on lands either purchased of the United States, or still belonging to them. The number of persons of the latter class who thus occupy, without title, lands still belonging to the United States, is very large, exceeding, in some cases, that of the persons who have acquired titles. They have, however, generally settled themselves with the purpose of eventually purchasing the land. The third belt lies westward of the organized states and territories. It comprehends lands acquired by the Louisiana treaty, and of which the Indian title has been extinguished by treaties with several tribes of Indians. As there is no organized civil government, there is no white population in this region, except hunters and vagrants. On the southern portion of this district, west of the territory of Arkansas and the state of Missouri, the tribes of Indians removed from the Atlantic states, have been, or are proposed to be, established. The fourth belt comprehends all the remaining district to the Pacific ocean. It lies on both sides of the Rocky mountains. The United States have acquired the title to it by the Louisiana treaty (see *Louisiana*), by the discovery of the coast, and by interior exploration. The title, however, to that part of this region which is west of the Rocky mountains, is contested by Great Britain. Great Britain claims, not that the title is in her, but that the region is unappropriated, and open to the first comer. By a convention concluded in 1828, to last twelve years, it was agreed between the United States and Great Britain, that neither government would take possession of it or occupy it, to the exclusion of the other, during the period of the convention, which either party might renounce, on giving twelve months' notice to the other. A chain of trading posts, belonging to the British North-West Company, extends through this region, to the mouth of the Columbia river. It is also visited by hunters from the United States, but in numbers far less than those from the British colonies. The Indian title to this whole fourth belt of land remains unextinguished; and the soil of that part of it lying east of the Rocky mountains, is supposed, for the most part, to be too sterile to become the residence of civilized man. The title to these lands was the subject of the first great political controversy that divided the opinions of the citizens of the United States, after the declaration of independence. The ancient charters of several of the states extended from sea to sea, or indefinitely to the west. They consequently crossed each other, and threw the same territory into the limits of different states. This was one source of dissension; and another was, that, as the greatest part of the western region was wholly unsettled, and the war was carried on at the common charge, it was deemed unjust by those states whose western boundary was ascertained, that they should have no interest or share in the vacant lands. The discontent of Maryland on the subject was so great that she refused to come into the confederation, and delayed the ratification of that instrument of government till 1781; and when she finally acceded to it, did so with a reservation of her rights. The serious controversies on this subject were put at rest by several acts of cession, made by the states interested to the United States. New York set the example, by an act passed on the 1st of March, 1781. Virginia followed, on the 1st of March, 1784, and her cession was deemed of the greatest importance, as her claim extended over a vast region (the territory north-west of the Ohio), and had been strengthened by the military efforts of the colonial government of Virginia to protect the territory against the French in the former wars. Massachusetts ceded her claim on the 19th of April, 1785, and Connecticut hers on the 13th of Sep. 1786. By these several acts of cession, the United States acquired an undisputed title to the territory north-west of the Ohio. Out of this territory have been formed the states of Ohio, Indiana and Illinois, the territory of Michigan, and an extensive territory west of it, which it has already been proposed in congress to organise under a separate territorial government. Connecticut, in making her cession, retained a considerable district in Ohio, known by the name of the "Western (or Connecticut) Reserve," which was finally ceded to the United States in 1800, and by the United States to Ohio. The foundation of the ample school-fund of Connecticut was laid in the proceeds of this reserved tract. North Carolina made a cession of the tract of country now forming the state of Tennessee, in 1789. It was subject to a great variety of claims, described in the act of cession. In 1806, congress ceded to Tennessee a considerable part of the public land in that state. The title to the residue is still vested in the United States, but no land-office has ever been opened by the general government in this state, nor have the public lands been surveyed and brought into market. It has been represented to congress that all the valuable portions of them have been long settled, and attempts (hitherto unsuccessful) have been made, of late years, to obtain a donation of them, or a sale of them on very easy terms, to the actual settlers. South Carolina ceded her claims to western lands by an act of her state government of 1787. The cession of Georgia alone was needed for the amicable adjustment of this great controversy. This took place, after a series of highly embarrassing transactions, in 1802, when a compact was entered into between the United States and Georgia, by which the latter ceded to the United States all her claim to the lands west of the present western boundary of Georgia, and the United States contracted to extinguish the Indian title east of that line, as soon as it could be done "peaceably and on reasonable terms." On the tract of land to which Georgia thus ceded her claim, the states of Alabama and Mississippi have been formed. The expenditure directly incident to the acquisition of the public lands may be stated as follows: but it must be recollected that other public objects, of the highest moment, have been affected by those treaties with Indian tribes and foreign powers by which the various cessions of land have been attained. The Indian treaties have been frequently treaties of pacification as well as territorial acquisition; and the political advantages of the Louisiana and Florida treaties vastly outweigh, in importance, the mere value of the land acquired.

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* This article may appear too transatlantic in its character for a British Encyclopedia; but we give it a place notwithstanding, feeling that its information must prove new and interesting to many a politician, agricultural speculatist, and emigrant.

	Dollars.
Expenses of Indian treaties, from 1776 to 1826,	3,868,379
Payment to Georgia, under the compact of 1802,	1,250,000
Do. on account of Yazoo Scrip,	4,950,000
Purchase of Louisiana,	15,000,000
Do. Florida,	5,000,000
Expenses of surveying 140 millions of acres,	2,164,000
Do. incidental to the sales of public lands, up to June 30, 1828,	1,435,197
	33,667,576

Since the date to which these computations are brought large expenditures have been made, and much larger ones may be expected to be incurred in extinguishing the Indian title to lands in Georgia, Alabama, and Mississippi.

The public lands were very early looked to as a source of revenue to the country. As early as 1776, Silas Deane, then a political and commercial agent of the United States in France, communicated to congress a plan for the sale and settlement of the territory north-west of the Ohio;* and, as has been already observed, the calculations of the future value of this region formed the first great subject of collision between the several states of the confederacy. It was, however, a long time before an effective system was devised, by which the lands could be thrown open to settlement, or made available for the purpose of revenue. Bounty-lands having been promised, by the continental congress, to the officers and soldiers of the continental army, it became necessary to redeem that pledge as early as possible. The controversies between the several states, and between them and the United States, retarded, for some time, the fulfilment of this pledge. On the twentieth of May, 1785, an ordinance was passed by the congress of the confederation, for ascertaining the mode of disposing of lands in the Western Territory; and this was the first act of general legislation on the subject. This act may be found in the new edition of the Land Laws, p. 349. Under it very limited sales were made, not amounting, in the whole, to more than 121,540 acres. In addition to these sales, there were three considerable sales "by special contract," as it was called. The first was of "the Triangle," a tract of land on lake Erie. This tract was ceded to Pennsylvania, September 4, 1788. It consisted of 202,187 acres, and 157,640 dollars accrued from the sale. The next sale was to the "Ohio Land Company," of a tract of land on the Ohio and Muskingum rivers, originally intended to include two millions of acres, but afterwards reduced by agreement to rather less than one million. The price of these lands was two thirds of a dollar an acre, receivable in evidences of the public debt. The Ohio Company commenced the settlement of the state of Ohio in 1788. The third of these sales was also in Ohio, to John Cleves Symmes, of the tract of land between the Great and Little Miami rivers, eventually reduced to 248,540 acres. On the tenth of May, 1800, an act of congress was passed, laying the foundation of the land system as it now exists. It has received several modifications at subsequent periods, two of which are of great importance, and will presently be stated. Under this law, the substantial features of the land system of the United States, are the following:—All the lands, before they are offered for sale, *are surveyed on a rigidly accurate plan, at the expense of the government*. The surveys of the public lands of the United States are founded upon a series of true meridians. The first principal meridian is in Ohio, the second in Indiana, the third in Illinois, &c., each forming the base of a series of surveys to which the lines are made to correspond, so that the whole country is at last divided into squares of one mile each, and townships of six miles each: and these subdivisions are distributed with mathematical accuracy into parallel ranges. The greatest division of land marked out by the survey is called a *township*, and contains 23,040 acres, being six English or American miles square. The township is subdivided into thirty-six equal portions or square miles, by lines crossing each other at right angles. These portions are called *sections*. The section contains 640 acres, and is subdivided into four parts, called *quarter sections*, each of which, of course, contains one hundred and sixty acres. The quarter sections are finally divided into two parts, called *half-quarter-sections*, of eighty acres each, and this is the smallest regular subdivision known to the system. The sectional and quarter-sectional divisions are designated by appropriate marks in the field, which are of a character to be easily distinguished from each other. The half-quarter-sections are not marked in the field, but are designated on the plot of the survey, by the surveyor-general marking the distance on one of the ascertained lines, in order to get the quantity of such half-quarter-sections as exhibited by his plot of survey. The fractional sections which contain less than one hundred and sixty acres are not subdivided. The fractional sections, which contain one hundred and sixty acres and upwards, are subdivided in such a manner as to preserve the most compact and convenient forms. A series of contiguous townships, laid off from north to south, is called a *range*. The ranges are numbered north and south from the base or standard line, running due east and west. They are counted from the standard meridian east and west. The superintendence of the surveys is committed to five surveyors-general. One thirty-sixth part of all the lands surveyed, being section number sixteen in each township, is reserved from sale, for the support of schools in the township, and other reservations have been made for colleges and universities. All salt springs and lead mines are also reserved, and are subject to be leased under the direction of the president of the United States. The government has generally found it expedient to authorize the surveying of forty townships of land annually, in each land district, so as to admit of two sales by public auction annually, of twenty townships each. The general land office at Washington is under the superintendence of an officer, called "commissioner of the general land office." It is subordinate to the treasury department. The public lands are laid off into districts, in each of which there is a land office, under the superintendence of two officers, appointed by the president and senate, called the "register of the land office, and the receiver of public moneys." There are at present forty-two land offices. The register and the receiver each receive a salary of five hundred dollars per annum, and a commission of one per cent. on the moneys paid into their office. Till 1820, a credit was allowed on all purchases of public lands. In consequence of this system, large quantities of land had been purchased on speculation; and also, in the ordinary course of purchases, a vast amount of land-debt to the government had been contracted. To relieve the embarrassed condition of these debtors, an act was passed, authorizing the relinquishment of lands purchased, and substituting cash payments for the credit system. The most beneficial effects have resulted from this change, apart from the relief of those who were indebted to the government. At the same time the *minimum* price of the land was reduced from two dollars to one dollar and twenty-five cents an acre. In the first instance, the public lands are offered for sale, under proclamations of the president, by public auction, with the limitation of the minimum rate. Lands not thus sold are afterwards subject to entry, at private sale, and at the minimum price. A very large amount of public land is in the occupation of persons who have settled upon it without title. This is frequently done in consequence of unavoidable delays in bringing the land into market, and not from any intention, on the part of the settler, to delay payment. Laws have been passed, granting to settlers of this description a pre-emptive right in the acquisition of a title, that is, the preference over all other persons in entering the land at private sale. These laws afford the actual settler no protection against those who might choose to overbid him at the public sales; but it is believed that in most cases, by mutual agreement among purchasers, the actual settler is enabled to obtain his land, even at public sale, at the minimum price. It is stated, however, that great injury is done to the settlers, by combinations of land speculators, who infest the public sales, purchasing the lands at the minimum price, and compelling *bona fide* settlers to take them at an enhanced valuation. Should the settler refuse such an agreement, the speculators enter into competition with him at the sale. On the whole it would appear, that on an average, the government obtains but the minimum price for its lands, although the quantity actually sold and occupied, being the choice of the whole quantity brought into market, is of course worth much more. Five per cent. on all the sales of public lands within the states severally, is reserved; three-fifths of which are to be expended by congress, in making roads leading to the states; and two-fifths to be expended by the states in the encouragement of learning. The first part of this reservation has been expended on the Cumberland road; and the treasury of the United States is greatly in advance to that fund, on account of this public work. It appears that, up to the present time, about 150 millions of acres of the public lands have been surveyed. Of these, thirty millions have not been proclaimed for sale; twenty millions have been sold, and as much more granted by congress for education, internal improvement, and other purposes. There are, then, 110 millions of acres surveyed, but not sold; eighty millions of which are in the market, ready for entry at the minimum price, and thirty millions subject to be proclaimed for sale whenever there is a demand.

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* Diplomatic Correspondence of the Revolution, vol. i., p. 79.

In a former article (*Agrarian laws*, q. v.) we gave some account of the Roman agrarian laws, the name of which has long been familiar to every reader, although their real character has, until the investigations of Mr Niebuhr, been much misunderstood. We there observed also, that the republic of the United States, like that of Rome, had been much occupied in legislating on the subject of its *public lands*; and that, as laws had been made in some of the states of the Union, bearing a considerable resemblance to the agrarian laws of Rome, we should make some further remarks upon the subject in the present article. The nature of this work, as we then observed, forbids the full development of a subject which partakes so much of a legal investigation as this does; but we think some illustrations derived from our laws, and the peculiar circumstances of our new country, will not be unacceptable. The laws and practice of the state of Massachusetts will afford sufficient materials for our purpose. This state has always owned a large body of public lands, situate in that part of its original territory which now constitutes a separate state, called the state of Maine. These lands, both from the necessities of the state government and the usual operations of capitalists, became an object of speculation. They were accordingly sold by the state, from time to time, in large tracts, to capitalists and speculators, who, in general, resided in Massachusetts Proper (as it was called before the separation of Maine), at a great distance from the lands thus purchased by them. Their lands, being thus entirely out of their view and control, were of course continually intruded upon, and possession taken, here and there, of parcels of them by emigrants from the more populous towns, who put them under cultivation, and erected houses and other buildings upon them for the common purposes of agriculture. These unauthorized settlers have been familiarly called by the cant term *squatters*, a name naturally derived from the act of settling upon lands in the manner practised by them. By the lapse of time the mere *possession* of these settlers, without any legal title to the land, ripened into what they considered to be a *right*, although the proprietors of the soil were, in general, wholly ignorant of such occupation of their property. At length, after a long series of years, it became impossible to dispossess them, however wrongful their possession, in its origin, may have been.

PUBLIC STOCKS or FUNDS; the name given to the public funded debt, due by the government of a country to individuals.

I. *British Stocks.* The practice of borrowing money in order to defray a part of the war expenditure, began, in England, in the reign of William III. At first it was customary to borrow upon the security of some tax set apart as a fund for discharging the sum borrowed; but afterwards the practice of borrowing for a fixed period, or upon *terminable* annuities, was almost entirely abandoned and most loans were made upon *interminable* annuities, or until such time as government might find it convenient to pay off the principal. The interest stipulated for loans during the reigns of William III. and Anne was various. But latterly, instead of varying the interest upon the loan according to the state of the money market at the time, the rate of interest was generally fixed at three or three and a half per cent.; the necessary variation being made to the principal funded. Thus suppose government preferred borrowing in a three per cent. stock, and that they could not negotiate a loan for less than four and a half per cent., they effected their object by giving the lender, in return for every £100 advanced, £150 three per cent. stock; that is, they bound the country to pay him or his assignees £4 10s. a-year in all time to come, or, otherwise, to extinguish the debt by a payment of £150. In consequence of the prevalence of this practice, the principal of the debt now existing amounts to nearly two-fifths more than the sum actually advanced by the lenders. Britain, as is well known, has a greater public debt than any other nation. In 1833, the total funded and unfunded debt amounted to £781,378,549 10s. 2½d. (See the article *Britain;* also the table in the article *Europe.*) But the resources of this country are so great, and the punctuality with which its obligations are discharged so unfailing, and the moneyed men in the country so numerous, that its stocks are the most in demand. The national debt of Britain consists chiefly in stocks which are variously designated, partly according to the rate of interest which the government engages to pay; as five, four, and three per cent. stock; and partly from the financial operations to which they have been subjected: thus the name of *reduced funds* is given to those on which the interest has been reduced, in consequence of the option which the government has offered to the public creditors to receive back their capital, or to take a lower rate of interest.—*Consolidated annuities* is a name derived from an operation of the government, commenced in 1751, when an act of parliament was passed, by which the various loans, for the repayment of which particular funds had been assigned, were united, and all the funds, including the sinking fund, consolidated into one. These various names convey no idea of important differences to the owners and purchasers of British stocks. Even the distinction between funded and unfunded debts is connected with no difference in the degree of their security. For although a regular portion of the national revenue is appropriated to the payment of the former, yet the interest of the latter is equally secure; and they are changed into funded debts whenever the state finds it impolitic to discharge them in the common way, and the creditors concur in the alteration. For the gradual reduction of the funded debts, a sinking fund was established, designed to diminish the debt by repurchasing its shares at their current price—a method which has been adopted by many European states. It has been lately discontinued, (See *Sinking Fund.*) In Britain, it has served, from the beginning, to keep up the credit of stocks, as it has maintained a constant demand for them in the market; and this it has done the more effectually in proportion to its amount; for, in case the stocks should fall too low, the price may be raised again by extinguishing a part of the debt. This effect of the sinking fund in facilitating the sale of the public stocks, greatly contributes to recommend them. For capitalists feel it extremely convenient to hold certificates of stock, which not only yield a regular interest, but may, at any moment, be turned into money without loss, and perhaps with profit. The history of the origin of the various debts of Britain, their conditions, the measures adopted for the payment of interest, or the repayment of the capitals, or the sinking them by repurchase, may be found in Grellier's History of the National Debt, and in Hamilton's work on the same subject. A concise view of the same has been presented by Bernard Cohen in his Compendium of Finance (London, 1822). Although a large amount of the British stocks always remain stationary in the hands of companies, public institutions, and many private persons, who retain them as the safest source of income, still a large proportion are bought and sold every day; and they are a very important article of traffic in Britain. As the three per cent stock is the most in the market, the price in the public papers relates to this, if the kind of stock be not particularly designated. Moreover, it regulates the price of the three and a half, four, five, and six per cent. stocks, which vary proportionally with it. Those public obligations which entitle the holder to payment of the capital at a time designated, or to an equal amount in the public stocks, as exchequer bills, navy bills, &c. naturally bring a price proportionally higher. The best standard of the credit of the public stocks is the rent of land. At present, land in Britain is generally sold at thirty-six years' purchase in times of peace, and at thirty years' purchase in time of war; that is, capital invested in landed property yields two and seventy ninths per cent. in time of peace, and three and one-third per cent. in time of war. Within the last thirty years, the *three per* cent. stocks have been worth from fifty-eight to eighty-two per cent.; so that the stocks, at the highest rate during this period, have *yielded but* about the amount of land rents in time of war; for a man, who purchases three per cent. stocks at eighty-two per cent., receives but about *three and* a half per cent., on his capital. In buying stocks in Britain, the purchaser does not receive any certificate; but his name is merely *registered in the* great national debt books, together with all his characteristic designations. If he ever sells the whole, or a part of it, this is transferred from his name to that of the purchaser. Every proprietor can, indeed, have a certificate of what is due to him in the national debt books; but, in the stock-market, this certificate is not considered of value, and a person may sell and transfer his property in the funds without being asked for it. Every stockholder must receive his interest, or make his entry and transfer of stock himself, or by a representative regularly authorized. It would be impossible to conceive, how the book-keepers could be convinced that the multitude of claimants who appear before them, are the true proprietors, if it were not known that the greatest part of the business, both the transfer of capital and the receipt of interest, is negotiated by stock brokers, who are well known to the book-keepers; and cases of imposition are, in fact, very uncommon. Moreover, the direction of all the traffic in stocks is committed to the bank of England. The registry books are arranged alphabetically, and distributed into several chambers, which are marked with the initial letters and syllables of the books they contain. Thus every one can easily find the place of the book which contains his account. The payment of the dividends, which occurs at an appointed day, semi-annually, is completed in fourteen days.

II. *French Rentes and public Certificates.* The national debt of France was formerly far greater than that of Britain. After the death of Louis XIV., it was estimated at 3,111,000,000 livres (about £123,000,000), when Britain had a debt of only about £45,000,000 sterling, both reckoned according to their nominal capital. But the relative amounts are now wholly changed. The nominal capital of the national debt of Britain was, in 1823, about thirteen and two-thirds that of France. France reckons its debt, however, not according to the amount of the capital borrowed, but only according to the annual amount of money to be paid, which gives a juster idea of its extent, both kingdoms having discharged themselves from the obligation to pay back the capital, and being bound to pay merely the interest. Britain, in fact, pays annually to its creditors about three and a half times what France pays. The nominal amount of the debts of these two states will be found in the table of European states. This is not the place to inquire whether such a difference makes the condition of Britain more unhappy than that of France. We will only remark that the national wealth of Britain during that period has increased in a much greater ratio than the wealth of France, and the British stocks have always borne a higher price than the French; for, while the French five per cent. stocks are worth but ninety-seven per cent., the British are commonly worth 145. If we carefully examine the history of the national debt of France, we cannot help wondering how the French stocks stand so high as they do. Immediately upon the death of Louis XIV., the regent reduced the borrowed capital and the interest arbitrarily, and without consulting the creditors, one third; and both debt and interest still continued to be paid as irregularly as ever. In this state of things, Law (q. v.), a Scotch projector, promised to cancel the public debt with paper. But this project embarrassed the finances of the kingdom more than ever. Various measures were taken, each more fallacious than the preceding, to improve the state of the treasury, and to diminish the national debt. They were designed to quiet the clamours of the public creditors, without giving them any thing but the consolation that they should not lose the whole of their demands. The revolution for a long time put an end to all claims, and almost wholly destroyed the value of the stocks; so that, when Bonaparte was in Egypt, a *rente* of five francs might be purchased for ten, five, and even three francs. In 1798, a new disposition was made of the public debt. All the claims of the emigrants were cancelled; two-thirds were struck off from the remainder of the debt; and the third which was left was changed into five per cent. annuities, called *tiers consolidés*, which compose a large part of the present stocks. They amounted, in 1798, to 302,000 francs * a-year. Since that period, numerous additions have been made to the debt by subsequent loans, so that, in 1822, 178,364,560 francs were annually required for the discharge of the perpetual and funded *rentes*. But there are many unfunded *rentes* to be paid besides; and the sinking fund consumes 40,000,600 francs every year. In 1822, therefore, the whole amount of the annual *rentes* was 228,864,560 francs, exclusive of four millions newly created for the Spanish war. During the last war, the *rentes* were again paid irregularly, and the arrears accumulated. These and other debts, which were contracted in the course of the war, were paid in obligations bearing five per cent. interest, and to be discharged at their full nominal value, within five years from 1821. These obligations are called *reconnaissances de liquidation*, and are likewise transferable. The nominal amount of those remaining due in 1828, was about 300 million francs. At present, France seems to be very punctual in the payment of its *rentes;* and therefore the French stocks, of late years, have brought a high price, and did so, in fact, even during the reign of Napoleon. The economical regulations for liquidating claims for the payment of interest and principal are a good imitation of the measures of Britain, so far as relates to the funded five per cent. *rentes*. They are all registered together in the *grand livre des dettes publiques*, after the manner of the books of the bank of England. Each stockholder has a distinct leaf for every *rente* he possesses. The dividends of the five per cent. annuities are paid twice a year, March 22 and September 22. The amount paid is stamped on the back of the certificate, and the owner of it gives a receipt. The dividends can be paid not merely in Paris, but likewise in the provincial towns. Owners who cannot receive their dividends personally, and are unwilling to let their certificates go out of their hands, appoint a special attorney to receive what is due, who is furnished with a certified copy of the original certificate. Besides the consolidated five per cent. *inscriptions*, there are other stocks in France, of various kinds, with which an important traffic is carried on, and which are subject to different regulations. They include, 1. the before-mentioned *reconnaissances de liquidation*. 2. Bank stocks. The shares in the bank of France are 90,000, each of the value of 12,000 francs, paying yearly sixty francs at least. If the profits do not yield this amount in any particular year, it is made up from the reserved fund. These stocks are transferable. In 1822, they were twenty-five per cent. above their nominal value. 3. The obligations of the city of Paris. The city of Paris was authorized, in 1816, to create stock to the amount of 1,500,000 francs, to defray the expenses of the city. The sale was but small during that troubled period, and the city was therefore afterwards empowered to issue 33,000 certificates worth 1000 francs each, and payable to the holder, to be discharged within twelve years, ending July 1, 1829. These certificates bear an interest of six per cent. a year, to be paid quarterly. 4. Another kind of paper often found in the market consists of *actions des ponts*. They are issued by a company which has built three bridges over the Seine, and comprise 3780 shares, at 1000 francs each. The dividends are fixed every year at a meeting of the proprietors. The amount is regulated by the income of the bridges, which is all divided among the shareholders, except one thirtieth. This thirtieth is distributed into three parts, of which one goes to the support of the bridges, and the others form a capital to pay off the stocks. Besides, there is a multitude of shares of insurance companies. 5. There is also in Paris a *caisse des depôts et consignations*, where money, in coin or notes is taken by the bank of France, and three per cent. interest paid upon it, commencing after it has been in the treasury thirty days. The money deposited may be taken out at any time by restoring the receipt.

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* For the value in Sterling money of the various coins mentioned in this article, see the article *Coins*.

III. *Austrian Stocks.* Austria has long had a large debt, and, till the French revolution broke out, punctually fulfilled its obligations to its creditors. But, during the war of the French revolution, its finances fell into great disorder; and various measures, adopted to remedy the evil, did not contribute to the public credit. Among these was the immense increase of paper money since 1797; for, till that time, the bank paper of Vienna, which, for a long period, was the common medium of exchange, remained about on a par with specie, it being exchangeable, at any time, for silver, on presentment. But, this year, the payment of specie was limited, and, the year following, stopped entirely; and the paper money so increased, that it soon fell rapidly below the value of silver. The means resorted to as an antidote for the consequent embarrassment were ineffectual. One of the most remarkable was adopted in 1798. It was a forced loan, by which the holders of public stocks were compelled to add thirty per cent. to what they had already paid, on pain of losing the whole; in consideration of which they were to receive five per cent. instead of four. As the loan was all made in convention money, it was understood that the interest should be paid in the same. But this was extremely difficult for the state, on account of the continual depreciation in the value of the paper currency; and, finally, it seemed to be impossible, when an attempt, made in 1802, to recruit its declining strength by lottery loans and other measures, failed. In 1811, therefore, the interest was reduced to half; and, in order to make this half still smaller, the existing paper money was changed for *redemption notes*, so called, a note of one guilder being paid for five old paper guilders. It was hoped that these certificates would be esteemed as valuable as specie. Hence the reduced interest was to be paid in this new paper, and not, as before, in coined money. But these notes never fulfilled the design for which they were created; and a large amount of new paper, under the name of *anticipation certificates*, was put in circulation, about equal in amount to that which the redemption notes had been intended to supersede, so that, in a short time, both kinds of paper sunk as low as the old bank notes. In this way, the early creditors of the state lost a large part of their interest and capital. In 1816, the finances of Austria were put under better management. The new administration devoted their chief attention to two objects:—First, to raising the value of the paper money, and, as far as possible, abolishing it; and next to fixing the public credit on a new basis, by restoring to the old claims a portion of their rights, and by negotiating new loans on a more firm and solid basis. In 1816, a new bank was furnished with funds in specie, and empowered to issue new notes, which were to be paid to the holders on demand in silver money. This bank, to which was intrusted the whole business of amending the currency and public credit, commenced its task by giving notice, June 1, that any person might bring in any sum in the old paper money, and receive for it five sevenths in new certificates, bearing one per cent. interest in convention money, and two sevenths in new bank notes, which every one might exchange at the bank for their value in convention money. Thus a proprietor, who deposited 7000 guilders in paper money, received for it 5000 guilders in certificates, bearing an interest of fifty guilders in convention money, and 2000 guilders in new bank notes, which he might exchange for convention money at the bank on demand. But the pressure to procure specie in exchange for the bank notes thus obtained was so great that the supplies and resources of the bank would have soon been exhausted, so that the whole system was abandoned a short time after it was established. Several millions of one per cent. certificates were created by this operation, and some of them are still in circulation. Bank shares, at 500 guilders convention money, might be obtained for 2000 guilders in paper money and 200 in convention money. The paper money thus obtained was to be destroyed. Both measures, however, only partially effected the desired object, and they were soon abandoned. October 29, therefore, of that year, a measure was brought forward founded on juster views. This gave rise to the *metalliques*, so called. A voluntary loan was opened, and the deposits were received partly in public certificates bearing interest and partly in paper money. For an old Austrian certificate of 100 guilders, and the additional sum of 80, 100, 110, 120, 130 guilders in redemption or anticipation notes, according as the old certificate yielded six, five, four and a half, four, three and a half, or three per cent. interest, a new state obligation was given of 100 guilders, bearing interest at five per cent., both payable in specie. A sufficient fund was, at the same time, provided for the punctual discharge of the interest and for the gradual extinction of the capital by repurchase. This gave assurance to the proprietors of these certificates that they might sell them with scarcely any loss, whenever so inclined. These *metalliques*, therefore, soon obtained extensive credit, and so confirmed the financial strength of the government, that it boldly resolved to establish the public credit on a broader basis. By a patent of Jan. 22, 1817, the sinking fund was organized after the example of the sinking fund of England, and all the funds were united in one for the payment of all public debts; and, by a regulation of March 21, 1818, the whole system of debt was reduced to such order that the proprietors of the old certificates began to be encouraged that their rights would be restored; and this hope gave the obligations once more a limited circulation. The capital of the old debt, of which the interest was reduced to half in 1811, was divided into sections, each of one million guilders. Five of these were to be restored every year to the enjoyment of full interest, and as many more to be bought in by the sinking fund. This plan has hitherto been very successful. By the gradual liquidation of the redemption and anticipation certificates, their amount was diminished, June 30, 1825, to 149,320,813 guilders (a guilder is about one shilling and ninepence half-penny); and, June 30, 1828, the amount in circulation in Austria was only 78½ million guilders. The *metalliques* have therefore come into the market in all the principal commercial cities of Europe. In the year 1821, the whole amount of the new debt contracted since 1815, or the five per cent. *metalliques*, was estimated at 207,970,290 guilders, and the proportion of the sinking fund to the debt at one fifty-seventh—the same ratio which the sinking fund in England bears to the public debt. The credit of these *metalliques* has risen very much. They stood, in 1817, at forty-eight, but had risen, in the beginning of 1823, to eighty-six, and even during the war between Turkey and Russia, they were at ninety-five. Besides these *metalliques*, the before-mentioned Rothschild lotteries re well known in the money markets. The Ausrian government, in 1820, negotiated, through a ompany formed by Messrs Parish and Rothschild, a *lotery loan* of 20,800,000 guilders, and soon fter a second of 37,000,000 guilders, convention money. The shareholders in the first loan were to receive back their capitals, and, instead of interest, premiums at the time of the repayment of the capitals, which was to take place in the course of the next twenty years. The smallest sum which an advance of 100 guilders can yield, is 120 guilders, and the largest 120,000. In the most unfavourable event, a man must wait twenty years for his capital and premium. The second loan was opened July 28, 1820, at four per cent.; and the government bound itself, within twenty-one years, to pay off the capital, with interest and premiums, by means of fourteen lottery drawings. The proprietors received certificates, dated January 15, 1821, each for 250 guilders. Whether a share in such a lottery can produce more than four per cent. interest, depends wholly on the time of drawing, and the premium which chance may allot. The price of the tickets of the first loan varies between 118 and 120, and of the second between 98 and 102. On an average, the premiums of the first and the interest and premiums of the second loan are equivalent to an interest of five and four fifths per cent. This new order of things was accompanied, in 1817 and 1818, by an improved organization of the national bank. The shares, which at first stood at scarcely 500 guilders in convention money, have now reached nearly 1000, and are in great demand, for they yield an annual interest of sixty guilders. The bank is, at present, wholly independent of the government.

IV. ***Prussian Stocks.*** Prussia had no public debt till 1787, but, on the contrary, had a considerable treasure in specie, and, even under the reign of Frederic William II, till 1806, owed only thirty million dollars, which were to be paid off at fixed periods. But the unhappy French war of 1806, and the more successful one of 1812—15, augmented the public debt of Prussia; and, after it had been reduced to order, her stocks came into the market in the principal cities of Europe, like the English, French, Austrian, and other public stocks. From the statement of February 17, 1820, it appears that the capital of the debts bearing interest then amounted to something more than 180 million Prussian dollars (about 123 million Spanish), and the yearly interest, or *rente*, to 7,637,177 Prussian dollars. Several millions have since been extinguished by the sinking fund. At present, the following Prussian stocks are in the market:—1. the proper national stocks, which comprehend the greatest part of the public debt, and the proceeds of which, in 1820, were 4,780,000 Prussian dollars (about 3,250,400 Spanish). They consist in obligations, which bear four per cent. interest, and are to be completely discharged within five years. The interest is paid January 1 and July 1 of every year, both in Berlin and in the provinces. Provision has likewise been made for their payment in specified places in foreign countries. The certificates promise that the capital shall be paid back by the annual extinguishment of one million at par; but this regulation has been modified by a later one, ordaining that the stocks shall be diminished by being repurchased, at the current price, till they stand at par, and then the repayment shall commence. The market value of these notes varied, in 1820—23, between sixty-seven and seventy-five per cent., and, still later, rose to nearly ninety; in 1828, it was at ninety-three. Of a portion of these obligations, premium lotteries were formed, thirty millions being sold, accompanied with premium certificates, at their full value in Prussian currency. The hope of receiving a great premium on the drawing of these lotteries (ten drawings were to take place, one each six months) produced such a demand for this species of stocks, that they rose to 120—130 dollars and upwards. 2. The shares in the English loan which was negotiated with Rothschild, in London, in April, 1818. The nominal amount is five million pounds sterling, at five per cent., and to be repaid within twenty-eight years, a certain amount annually, by repurchasing the notes, or redeeming them at par, if they are worth it. The certificates are expressed in English money, and the interest is payable in London. The unfavourable conditions, under which this loan was obtained, are to be attributed to the emergencies of the period. Though the interest is five per cent., only seventy-one per cent. of the nominal amount of the loan was received; and the government took the risk of the fluctuation of exchange in the payment of interest and principal. In London itself, before the certificates were issued, they had risen to eighty per cent. Besides these, there are the obligations of the Electoral Mark, which are of an early date, and the *Hypothekscheine*, secured on mortgages of the public domains, which were not created till after 1806. Both yield four per cent., and form together a capital of nearly nine million Prussian dollars (above six million Spanish), which, like the interest, is paid according to the original engagement. There are also the stocks of the provinces and principal cities. The mortgage stocks (*Pfandbriefe*) form a capital of perhaps fifty or eighty millions, the shares of which are bought and sold, and yield a secure income. These are created thus:—The landed proprietors, under the authority of the government, have formed associations in several of the Prussian provinces, which borrow money on the security of their estates collectively, and make loans to the individual proprietors, in consideration of mortgages of their separate estates. There are five of these provincial associations in Prussia. To the Prussian stocks belongs, also, the bank paper, which is transferable. The circulation of these notes, indeed, is somewhat difficult, for they are generally made payable to the particular individual to whom they are issued, and cannot be transferred without legal formalities. The royal bank receives money at two or three per cent. a year, and repays the money deposited, small sums on demand, and larger ones at fourteen days, or four weeks' notice. Hence it is filled with deposits, trust money, orphans' money; and many capitalists invest in it their unemployed funds. The violent measures of Napoleon's administration rendered it necessary for the bank to stop payment, in consequence of the loss of all its resources. The old system has been long resumed in regard to all moneys deposited since 1808; but the pressure of circumstances has hitherto made it impossible for the bank to fulfil its obligations in regard to the old capitals. The government has promised, however, that this debt shall be cancelled.

V. *Russian Stocks.* Previous to 1810, Russia had no debt on which interest was paid, and of which the stocks were in the market, except 83,000,000 guilders due in Holland; and the paper was hardly found in the commercial world out of Amsterdam. For many years, this stock stood at par. In 1810, a loan of twenty millions was opened in *assignats* at six per cent., for which the government pledged ten million silver roubles, with six per cent. interest, to be paid in five years to those who should not prefer perpetual annuities in *assignats*, or silver roubles. The design was to diminish the immense quantity of *assignats*. It was intended to have many series of these loans following one another, to destroy the paper roubles which might be brought in by their means, and thus to raise the paper money gradually to par, or perhaps to put it wholly out of circulation, and substitute silver money in its place. Although these loans never accomplished the desired object, and seemed to be founded on mistaken principles, yet they helped to confirm the credit of the government, because every stipulation was punctually fulfilled, and a regular financial system was forming in regard to the public debts. The interest of the first loan in silver was regularly paid; and the capital, too, was repaid in the way stipulated, notwithstanding the distress to which the kingdom was reduced by the war of 1812. The credit which the government thus acquired was, perhaps, worth the sacrifice of some millions; for the state had hardly any other advantage from this loan. These stocks, during their five years' continuance, were in great demand, and their price speedily rose above their par value in *assignats;* but this was not strange, for paper roubles were not worth in the market one third of silver, and, by the terms of the loan, a silver rouble was paid for every two paper roubles advanced. Only a few of these obligations are now in circulation, for, in 1815, they were nearly all cancelled. This system, however, was continued under better conditions as regarded the government, and to a much greater extent. The diminution of the *assignats* was the pretext for every measure. But the deficit in the income, and the expense occasioned by the war of 1812, were perhaps the principal causes of the successive loans. There have been three or four since 1816. The two first, made in 1817, at Petersburg, of seventy million roubles in *assignats*, were mostly reduced to silver money at a fixed valuation; the third and fourth were in England, in 1820, and amounted to forty million silver roubles. All the stocks of this kind bear five per cent. interest, and are regulated after the manner of the stocks in other countries, wherein the government merely pledges itself to discharge the stipulated interest punctually. The liquidation of the capital by the sinking fund is effected by re-purchasing the certificates or otherwise, as the state of the treasury renders most expedient. The arrangements for the public debt are similar to those in France and England. All the debts since 1817 have been registered, with the creditors' names in alphabetical order. At the same time, the creditors receive notes (inscriptions), which contain what is written in the book of registry, and the conditions and stipulations of the government, and are so prepared that they may be endorsed in blank in a foreign country, being verified by a Russian consul, and in this way transferred to any one without difficulty; and the directions, necessary in case of transfer, are contained in the *inscription*. An important traffic is now carried on, in all the markets of Europe, in Russian stocks. The interest on the English loan is payable, not merely in Petersburg, but in Hamburg and London, in the money of those places, at a fixed valuation, and the income of the Dutch stock is payable in Holland. The report of the minister of finance, January 1st, 1822, made the whole debt of Russia to consist of the following sums:—1. The Dutch, 48,600,000 guilders; 2. the domestic, in silver roubles 53 millions; 3. the domestic, in paper roubles, 296 millions. The fund destined for the liquidation of these debts is one million in silver roubles and five millions in paper —about in the ratio of one to fifty. Nearly ten million silver roubles are necessary for the payment of what is annually due on these stocks.

VI. *Dutch Stocks.* Although the public debt in Holland has been very great from the earliest times, yet, in consequence of the regular fulfilment of its obligations, and the multitude of wealthy capitalists in the country, the stocks have maintained a high credit, and, during the thirty-two years of tranquillity, from 1748 to 1780, they were in such demand, that, notwithstanding their low rate of interest (two and a half per cent.), they brought from eight to ten per cent. above their nominal value. But owing to the wars with England and France, the finances of the country were thrown into disorder; it is probable, indeed, that these wars only hastened a calamity which must, sooner or later, have fallen upon the people; for the deficit in the income was increasing every year after 1786, and the public debt, of course, was continually accumulating. The expenditures were multiplied by the oppression of France, and the deficit daily grew more enormous. Under the administration of Louis Bonaparte, in 1807, 1808, and 1809, loans of forty, thirty, and twenty million guilders, to cover the deficit, were obtained on tolerable conditions, as Louis Bonaparte maintained the credit of the state by opposing with firmness, on every occasion, the reductions of the public debt, which his brother proposed. When Napoleon united Holland with France in 1810, it was found that the national debt of this little kingdom amounted to the enormous sum of 1200 million guilders (about 480 million dollars.) Napoleon commenced a system of reform in the financial department, by setting aside two-thirds of the debt, as had already been done in France. The remaining third was to be registered in the great book of France, as a part of the general national debt, and, like the rest, to pay an interest of five per cent. This measure, however, was never carried into execution. After the establishment of the kingdom of the Netherlands, subsequent to the fall of Napoleon, the debt was newly organized, and, by the law of May 14th, 1814, was regulated by the following principles:—1. The two-thirds of the debt abolished by Napoleon were again acknowledged, although his measure was, in a degree, sanctioned, by the division of the new debt into a real or active, and a nominal or dead one; the interest of the first (the third retained by Napoleon) was to be paid from January 1st, 1815: and the interest of the latter (the two thirds abolished by Napoleon) was to commence gradually; so that every year from four to five millions should be put on the same footing with the active debt, as to the payment of interest of the abolished debt. All subsequent obligations were required to be presented, and for an advance of six per cent. in specie, were changed into new obligations, of which all were fixed at two and a half per cent.; in such a way, however, that two-thirds of the new notes were assigned to the dead debt, which paid no interest, and only one-third of the amount was transferred to the new debt, bearing interest from 1815. Charitable institutions, holders of life annuities, and some other classes, however, had some particular privileges. But the debts contracted during the French administration were put under less favourable conditions. These obligations, frequently increased by new loans, formed the Dutch stocks found in the money market, of which those that yielded an actual income, were sold before the Belgic revolution for forty-six to forty-seven per cent. Shares in the nominal debt are regarded like shares in a lottery, and stand at one quarter per cent., or even still lower (five eighths); this is sufficient evidence, how little the purchasers think of soon obtaining any income from them. In 1819, seventeen million guilders interest were to be paid. The sinking fund was fixed, in 1821, at 2,500,000 guilders annually. Besides these debts, which include those of Belgium, the government of Holland assumed the responsibility of paying a portion of the Russian-Dutch debt (of eighty-three million guilders), and 1,443,750 guilders were devoted every year to the discharge of the interest and gradual liquidation of the capital. These obligations belong to the unfunded debt, as does also the Austrian-Belgic debt of about six million guilders, and other obligations little known out of the country.

VII. *Neapolitan Stocks*. The Neapolitan finances, on the whole, have been subject to no little disorder; but, at the close of the last reign, measures were adopted for the punctual payment of the stipulated interest and *rentes*, even though fresh loans should be required. The occupation of the kingdom by Austrian troops added to the national debt upwards of nine million ducats (about 7,200,000 dollars). The French system of managing the public debt has been taken, to a considerable degree, as a pattern, the shares of the creditors being registered, and bought and sold in the same manner as in France. The yearly amount of income from the debt was estimated, January 1st, 1821, at 3,882,000 Neapolitan ducats (about 2,928,000 dollars). This income is five per cent. The Neapolitan stocks have hitherto found purchasers in the European markets at low rates.

VIII. *Spanish Stocks*. The history of the old debt of Spain is a chaos of confusion. It has been always loaded with arrears and unpaid interest. According to the statement of November 29th, 1820, only a part of the Spanish debt bears interest. The part which does not bear interest consists of unpaid pensions, annuities, and many other unpaid and floating debts, but principally of paper money. These were estimated in the above mentioned year at 7205 million reals, or about 345,840,000 dollars. The public obligations bearing interest, which consist partly of old debts, new loans, &c., amount to 6,814,780,373 reals, or about 327,109,457 million dollars, of which the yearly interest is estimated at 235,966,630 reals, or 11,326,390 dollars. A plan was adopted, during the constitutional government, for paying off a portion of the debt by the sale of the estates of monasteries, the property of the inquisition, and the public lands; but the restoration of the absolute monarchy in 1823, put a stop to its execution, and the loans made by the cortes were declared to be invalid. Great deficits have since taken place every year, and till this day new loans have been utterly insufficient to cover them. The stocks which are most commonly found in the market at present are:—1. The Dutch-Spanish obligations of 1807, created by means of the house of Hope and Co., each of which is for 1000 Dutch guilders with interest, payable annually. The interest of this loan of thirty million guilders, and of several of the other debts, has never been paid since the French invasion of 1808. 2. The stocks of the Laffitte loan of fifteen million dollars, which was negotiated in Paris. Each certificate is for one hundred dollars. A lottery ticket is connected with every one, by which the certificate gains a greater or less premium (from eighteen dollars to 20,000) whenever its number is drawn. The obligations are to be paid within twenty years from 1825, agreeably to the regulations for the annual extinction of a portion, with the premiums belonging to them. 3. The certificates of the loan of 1821, negotiated by the house of Ardouin, Hubbard and Co., fixed at different sums in dollars, and with interest payable semi-annually in Paris and London. 4. The certificates of the national loan of 1821, which is connected with the last, or rather forms a part of it. Every certificate is for 150 dollars in specie, but the old obligations of the governments, as well as shares in stocks No. 1 and 3, and premium certificates, are received by the government in return for these new stocks, according to their market value. These new certificates were to bear five per cent. interest, paid annually at Madrid, Paris, or London, at the option of the holder.

IX. *Danish Stocks*. The obligations on account of the domestic loans, made for the sake of the liquidation and better regulation of the paper money, are scarcely found at all in foreign markets. But those that sprung from the loans of 1818 and 1819, in Hamburg, and from the English loan of 1821, have a wider circulation. The first loan of 1813 gave rise to obligations at five per cent. each, of the amount of 3000 marks, Hamburg banco (a mark banco is about thirty-four and a half cents), which were sold at par, because they involved a premium, in which every certificate gained, at least, 400 marks banco, in stocks bearing six per cent. interest, and under the most favourable circumstances, 200,000. After the drawing of the premiums, the five per cent. obligations of this description stood at 78—83; the six per cent. at 91—96. The loans of 1818 and 1819, in Hamburg, were concluded under similar conditions. The English loan of 1821 amounted to three million pounds sterling, and the obligations vary in amount from 100 to 1000 pounds sterling. All these loans are entitled to interest semi-annually, till all the capital is paid, provision being made for cancelling a portion of this capital annually. No loan could well rest on a firmer basis than the Danish. In regard to the premium notes, it is left with the government to repay the capital at pleasure. All the rest are gradually paid in full, as their numbers are drawn, and all the stipulations have hitherto been punctually fulfilled.

X. *Norwegian Stocks*. They arise from the loan of 2,700,000 marks, concluded in 1819, in Hamburg and Berlin, by the king of Sweden and by the Norwegian states, and consist of obligations which vary from 3000 to 300 marks banco. The method adopted to repay the capital is, to re-purchase the certificates as long as they are below par. Another Norwegian loan at six per cent. was negotiated in 1822, at Hamburg. It amounted to 2,400,000 marks banco. It is to be entirely paid off in twenty-nine years, in semi-annual instalments. The payments have hitherto been regularly made; and this circumstance, together with the guarantee of the states, seems to have given to these loans a high degree of credit, although the guarantee given by the states, of their associated kingdom, Sweden, to the stocks of the Frege loan, has not secured to the creditors a regular payment. For this reason, *Swedish* certificates are not found in the money markets.

XI. *Stocks of the German Confederation*. Nearly all the states in this body have public debts; their notes, however are scarcely ever seen in the markets of London, Amsterdam, Paris, Frankfort, and Berlin; they remain chiefly in the states where they originated, and are monopolized by the capitalists and institutions of those states. The certificates of the kingdom of Saxony enjoy the highest credit of all. Though the debts of this little territory amount to sixteen and a half million convention dollars (a Saxon dollar is about ninety-five and a half cents), the people believe the government to be so conscientious and trustworthy, that they dread rather than desire the repayment of their capital, which is in the hands of the state. From this cause the five per cents have risen to 110—111 per cent., and the three per cents to nearly 100; and the state has thus been enabled to exchange the former for four per cents. The new four per cents now stand at 104—105, and would stand still higher, if a small portion were not paid off semiannually; the three per cents stand at 101, and the two per cents at 90. Next in credit to Saxony are the kingdoms of Wurtemberg and Hanover, and the cities of Hamburg and Frankfort, whose four per cent. notes are all nearly at par, or even above it. Nor far below these are the certificates of Bavaria, Baden, Mechlenburg and Hesse-Darmstadt; and it is a general rule that the credit of the German states is greater, and their certificates stand higher, in proportion to the smallness of the states. These certificates, however, are not proper subjects of comparison with those of the larger governments. In the smaller states, almost all debts are contracted on condition of being repaid within a limited time, and the measures adopted afford the creditors good reason for believing that the promises will be fulfilled.

XII. *United States Stocks.* In 1775, when hostilities commenced between the United colonies and Great Britain, the Americans had no treasury, nor any organized system, to direct their resources. Congress authorized the issuing of a paper currency, and loans were obtained from foreigners, and from persons within the country. In 1783, the debts of the United States, as far as they could be ascertained, amounted to 42,000,375 dollars, and the annual interest was computed at 2,415,956. No provision had been made for the payment of the interest, and there was no plan in operation to redeem the principal; the faith of the government was doubted, and the evidences of the public debt were reduced to about one eighth of their nominal value. The estimated amount of the debt, according to the report of the secretary of the treasury, in 1790, was 79,124,464 dollars. 25,000,000 dollars of this were proposed to be assumed on account of the several states. 11,710,378 dollars was the amount of the principal and interest of the foreign debt; 40,414,085 dollars was the principal and interest of the liquidated part of the domestic debt. The unliquidated part, which consisted chiefly of continental bills of credit, was not ascertained, and was estimated at 2,000,000 dollars. In 1790, the public debt was funded, 600,000 dollars were annually reserved from the duties on merchandise imported, and the tonnage of vessels, or so much thereof as might be appropriated from time to time for the support of the government of the United States, and their common defence, and so much of the residue of the duties aforesaid as might be necessary was appropriated to the payment of interest on loans made in foreign countries, and also to the payment of interest on such further loans as should be obtained for discharging the arrears of interest thereupon, and the whole or any part of the principal thereof. The appropriations were to continue until these sums should be fully paid. The president was authorized to borrow 12,000,000 dollars to discharge the arrears of interest, and the instalments of the principal of the foreign debt. The United States reserved the right to reimburse any of the sums so borrowed within fifteen years after the same should have been lent. To provide for the domestic debt, a loan to its full amount was directed to be proposed. The sums subscribed were payable in the certificates issued for the domestic debt, according to their specie value, and computing the interest upon such as bore interest to the 31st of December, 1790, inclusively. The subscribers received two kinds of certificates, one for two thirds of the sum paid in the certificates just mentioned, bearing an interest of six per cent., payable quarter-yearly, and redeemable at pleasure, in payments not exceeding, in any one year, for principal and interest, eight dollars for each hundred mentioned in the certificate. This first stock was afterwards called *old six per cents*. The other certificate was for the remaining third, which, after 1800, was to bear interest, and be redeemable on the terms just mentioned. For such of the sums subscribed as were paid in the interest of the said domestic debt, or in the certificates issued in payment of interest, the subscriber received a certificate for a sum equal to that paid in, bearing three per cent. interest, payable quarter-yearly, and redeemable whenever provisions should be made by law for the purpose. This was called *deferred six per cents*. The stocks thus created were transferable only on the books of the treasury, or on those of the commissioners of loans, upon which the credit of the same should exist at the time of the transfer, unless by special warrant from the secretary of the treasury. The interest was made payable where the credit of the stock should exist at the time of its becoming due. If not demanded before the expiration of a third quarter, it was afterwards demandable only at the treasury of the U. States. To provide for the debts of the respective states, a loan of 21,500,000 dollars was authorised to be paid in the evidences of debt which had been issued by the states. For four-ninths of any sum thus subscribed, the subscriber received a certificate bearing six per cent. interest, and subject to the same conditions as those of the first sort mentioned under domestic debt; for two-ninths, another certificate, bearing six per cent. interest after 1800, payable quarterly, and redeemable as above-mentioned, and for the remaining three-ninths, a certificate bearing three per cent. interest, and redeemable when provision should be made by law for the purpose. Various stocks for small amounts were created in 1795, 1796, 1798. These were reimbursed in 1806, 1807, and 1808, with the exception of 80,000 dollars transferred to the national debt. In the year 1803, the Louisiana six per cent. stock was created for the payment of the purchase of Louisiana from France. Certificates for 11,250,000 were issued, bearing an interest of six per cent. The principal was made reimbursable in four annual instalments, payable, the first in 1818, the last in 1821. Besides this sum, claims of American citizens on the French government, to the amount of 3,500,000 dollars, were also assumed by the national government on account of the Louisiana purchase, and added to the national debt. Feb. 11, 1807, the government of the U. States proposed to the holders of six per cent. deferred and three per cent stocks, to exchange the same for six per cent. stocks, redeemable at the pleasure of the government. This was done with a condition "that no single certificate should issue for a greater amount than 80,000 dollars and that no reimbursement should be made, except for the whole amount of any such new certificate, nor till after six months, at least, previous notice of such intended reimbursement." The holders of three per cent. stock were to receive new certificates for sums equal to sixty-five per cent. of the principal of the stock, bearing an interest of six per cent. The amount of unredeemed and deferred six per cent. stock subscribed was 6,294,051 dollars, and the stock thus created was called *exchanged six per cents.*; the three per cents. subscribed at sixty-five per cent., produced 1,859,850 dollars which was called *converted six per cent. stock*, More *exchanged* stock was created in 1812, by the surrender of nearly 3,000,000 of the old and deferred six per cents. In 1812 additional stock was created by borrowing money to the amount of 8,134,700 dollars at six per cent., reimbursable after twelve years from Jan. 1, 1813. In 1813 more six per cent. stock, to the amount of 26,607,959, dollars was created by borrowing an additional amount, reimbursable after twelve years from Jan. 1, 1814. In 1814 six per cent. stock, to the amount of 15,954,619 dollars was added, reimbursable after twelve years from December, 1814. Under acts of congress of the years 1812, 1813, 1814, and 1815, treasury notes were issued to the amount of 36,680,794 dollars of which there had been paid off by December, 1816, 32,980,794 dollars, leaving unpaid in January, 1817, 3,700,000 dollars. The whole amount of the debt remaining unpaid Jan. 1, 1817, was estimated at 112,107,862 dollars of which, 75,450,930 dollars was contracted during the war; the remainder, contracted before the war, was 36,656,932. In March, 1817, congress passed an act to provide for the redemption of the public debt. By this, all acts making appropriations for the purchase or reimbursement of the principal, or for the payment of the interest of the funded debt, are repealed, and the annual sum of 10,000,000 dollars is appropriated to the sinking fund, and a further sum of 9,000,000 is appropriated for that year. The act also provides, that after the year 1817, any sum in the treasury above the annual appropriations shall be appropriated to the sinking fund, with the exception of so much as will leave in the treasury at the end of the year the amount of 2,000,000 dollars. The debt now went on diminishing till 1821, when it stood at 89,987,427 dollars; but the purchase of Florida, in that year, for 5,000,000 dollars increased it, so that it stood, in 1822, at 93,546,676 dollars. In March 1821, five per cent. stocks, redeemable after Jan., 1835, were created to the amount of 7,735,296 dollars. In May 1824, four and a half per cents. to the amount of 1,739,524 dollars were created, redeemable after January, 1832, and, in the same year, four and a half per cent. exchanged stocks were created, to the amount of 4,454,727 dollars redeemable after December, 1832 and 1833. In 1825, the public debt had been reduced to 83,788,432 dollars; in 1828, to 67,475,622 dollars; in 1830, to 48,565,405 dollars; in January, 1832, to 24,282,879 dollars funded, and 39,355 dollars unfunded; in January 1833, the total amount of the public debt in the United States of America, was little more than seven million dollars, and since that time it has been entirely liquidated. It remains yet to be seen how the recent almost universal bankruptcy, that has taken place in the States, owing to the renouncement of paper money, may affect the public exchequer.

XII. *South American Stocks.* The new S. American states, as Buenos Ayres, Chile, Columbia, several years ago, obtained loans in London. These have greatly depreciated, or have merely a nominal value.

Fraser's Magazine for January, 1832, contains an article entitled the Stock exchange, the subject of which is to show the enormous amount of capital drawn from England in nine years, beginning. say, with 1822, in the shape of loans and joint stock subscriptions. From the facts there presented, the following table has been prepared. The first column of figures shows the amount loaned; the second, the rate per cent. at which the loans were made; the third, the present value per cent.:—

		Loaned at.	Now worth.
Austrian,	L2,500,000	Not stated.	Not stated.
Brasilian,	3,200,000	75 per ct.	43 per cent.
Buenos Ayres,	1,000,000	85 "	nominal.
Colombian,	2,000,000	84 "	13 per cent.
Colombian second,	4,750,000	88½ "	13 a 14 do.
Chilian,	1,000,000	70 "	17 a 19 do.
Danish,	3,500,000	75 "	66½ per cent.
Greek,	800,000	59 "	22 a 24 do.
Greek (second.)	2,000,000	56½ "	22 per cent.
Guatemala,	1,428,571	73 "	nominal.
Mexican,	3,200,000	58 "	29 per cent.
Mexican (second),	3,200,000	89¾ "	35 a 36 do.
Neapolitan,	2,500,000	92½ "	uncertain.
Portuguese,	1,500,000	87 "	49 a 50 do.
Peruvian	1,816,000	88, 82 & 78	12 per cent.
Prussian,	5,000,000	70, 72½ & 75	99 a 100 do.
Prussian (second),	3,500,000	84 per ct.	99 a 100 do.
Russian (known),	3,500,000	83 "	99¾ a 100 do.
Spanish (about), or 31,000,000 dols.	6,500,000	84 & 68	14½ per cent.
Spanish (second),	1,500,000	30½ per ct.	14 per cent.
Total,	L54,894,571		

In addition to the above, the writer enumerates, twenty-seven joint stock companies, in behalf of which £6,145,065 were "exported from the national treasury to distant climes, without the shadow of an equivalent."

It is impossible to give a complete view of all public stocks. We can here only give a general idea of those of the larger states, and chiefly of those which are now important in the commercial world. States have always laboured to make their notes as easy to be obtained, and used in remote countries, as at home; so that a capitalist in Prussia may lay out his money not only in all kinds of German stocks, but in those of England, France, Denmark, Spain, and even America; receive the interest of them with the same ease, and sell them again with the same convenience, as those of his own country. In London, Amsterdam, Paris, Frankfort, Berlin and Leipsic, stocks of all descriptions may be obtained, and the interest on them all paid. Thus a branch of trade has arisen, which, fifty years ago, was unknown; and one of the consequences of this has been, that stocks have come into competition, like other articles of commerce, and those of equal goodness and security can be exchanged at an equal price; so that a state whose credit is good, may at any time create new stocks, or dispose of them whenever a profit can be made upon them. Hence, if the stocks of one state are higher than those of another, it may usually be attributed to one of the following causes:—1. That one state enjoys greater credit than another; 2. That the loans of one have been negociated on better conditions than those of another, as regards the prospect of gain, premiums, the payment of the capital at the time specified, the facility of obtaining the interest, &c.; 3. That the buying and selling, or procuring the interest of foreign stocks, costs a certain per centage, which, in the case of domestic stocks, is saved. Under certain circumstances, therefore, the price of stocks may be viewed as a standard of the comparative credit of different states. In May, 1823, the five per cent stocks of the following countries, created with similar conditions, sold at the following rates:

		Per cent.
1. The Saxon Stocks,	at	140—150
2. Those of England and Hamburg,	"	125—130
3. Those of Hanover, Wurtemberg, and other small German states,	"	98—100
4. The Prussian,	"	90
5. French,	"	86
6. Norwegian,	"	85
7. Danish	"	81
8. Russian,	"	80
9. Spanish,	"	37, &c.

As the price of stocks is affected by various circumstances, even though the government punctually fulfils its obligations, speculators are in the habit of buying and selling with a view of turning these fluctuations to account. See *Stock-jobbing*.

PUCK. See *Mab.*

PUDDING STONE. See *Sandstone.*

PUDDLING FURNACES. See *Iron*

PUEBLA, LA, OR LA PUEBLA DE LOS ANGELES; a state of the Mexican confederacy, formed of the Spanish intendancy of the same name, lying between lat. 16° and 20° 30′ N., and lon. 96° 40′ and 99° 30′ W.; bounded north by the states of Vera Cruz and Queretaro, south by that of Oaxaca and the Pacific ocean, and West by the state of Mexico. It is 322 miles in length from north to south, and 140 in breadth; square miles, 20,000. It is traversed by the cordilleras of Anahuac, and contains the lofty summits of Popocatepetl and Iztaccihuatl. The northern part is almost entirely formed of an elevated plateau, 6500 feet above the ocean, and fertile in corn and fruits; cotton and sugar also thrive here. Population of the state in 1793, 508,000; in 1803, 813,300. On the arrival of the Spaniards it was the seat of a powerful republic (Tlascala), which had maintained itself independent of the Mexican emperors. The capital of the state, of the same name is in lat. 19° N., and is one of the handsomest cities of North America: the streets are broad, straight and well paved; the houses large and well built; and there are numerous large squares. The church of Nuestra Senora de Guadalupe is one of the richest and most splendid in the country. Puebla contains sixty churches, twenty-two convents, and several literary seminaries and hospitals; its manufactories, particularly its potteries, are extensive; population, 67,000. The pyramid of Cholula is five miles distant from the city. Puebla was built by the Spaniards in 1533. See *Mexico.*

PUFENDORF, SAMUEL, BARON VON, one of the first and greatest expounders of natural law, publicists, and historians of Germany, was born in 1632, near Chemnitz, in the Erzegebirge, in the village where his father was a preacher. After having studied at the school of Grimma, and at the universities of Leipsic and Jena, he applied himself to public law, making philosophical or natural law the foundation of his studies. Being unable to procure a situation in his native country, he accepted, in 1658, the place of tutor in the house of the Swedish ambassador at the Danish court, and repaired with his pupil to Copenhagen; but a war breaking out between Denmark and Sweden, he was arrested, with the whole family of the Swedish ambassador. In this situation, which continued for eight months, he employed himself in studying the works of Grotius and Hobbes on law and government. The result of his labours appeared at the Hague in 1660, (*Elementa Jurisprudentiæ universalis.*) The learned elector of the palatinate, Charles Louis, to whom it was dedicated, was so much pleased with this work, that he founded for the author in 1661, a professorship of the law of nature and nations, the first in Germany. Here he taught till 1670, when the king of Sweden, Charles XI. offered him the professorship of natural law in the new university at Lund. He there wrote his work on natural law, (*De Jure Naturæ et Gentium*, Lund, 1672,) which superseded the former, and is characterized by perspicuity, method, and sound reasoning; soon after appeared the smaller compendium, or rather abstract of the above work, (*De Officio Hominis et Civis*, Lund, 1673.) which has passed through innumerable editions, and been translated into several languages. Pufendorf, in these works, deviated still further than Grotius from the scholastic method of philosophizing, and, consequently, excited violent opposition. However different opinions may be respecting these works of Pufendorf, it is not to be denied, that he made an epoch in the history of natural law. He had a more distinct conception than Grotius of a science, which, independently of positive law or theology, should determine the rules of right solely by the laws of reason. His law of nature was a philosophical morality, settling the mutual relations of justice between men, and which still remained dependent on the Christian morality. With Grotius, he laid the foundation of law in the social instinct, which is nearly allied to the Christian precept of love of our neighbour, and with Hobbes he derived law from the state of fallen nature. Pufendorf also made an epoch in the German public law. While professor in Heidelberg he wrote, at the suggestion of the elector, under the name of Severinus a Monzambano, the celebrated book, *De Statu Reipublicæ Germanicæ*, which he sent to his brother then Swedish ambassador in Paris, to be printed. It represents Germany as a republican body, whose clumsily joined parts formed an anomalous state. This book was violently attacked, and Pufendorf, who defended it with energy, did not think it advisable to avow himself as the author. He afterwards went to Stockholm, where he was appointed secretary of state, royal counsellor, and historiographer. There he wrote in Latin, the History of Sweden, from the campaign of Gustavus Adolphus in Germany, to the abdication of queen Christina (*De Rebus Suecicis*—1676.) and the History of Charles Gustavus, (*De Rebus a Carolo Gustavo gestis*—2 vols., fol., 1696,) and, in German, his *Einleitung zur Geschichte der vornehmsten Reiche und Staaten*, (1682, 2 vols.,) subsequently continued by Œhlenschlaeger and translated by Martiniere into French. These works so much increased his reputation, that in 1686, he received from Frederic William, Elector of Brandenburg, an invitation to Berlin as counsellor, historiographer, and judge of the supreme court of judicature, with the charge to write the life of that prince, which he finished under the reign of his son, Frederic III. In 1690, he was made privy counsellor of the elector of Brandenburg, and, in 1694, was created baron by Charles XI. king of Sweden. He died at Berlin, in 1694.

PUFFIN (*puffinus*). These birds, which also bear the name of *petrel*, are completely aquatic, living constantly at sea, and scarcely ever seen on shore; they, however, fly well, and keep on the wing for a long time; they chiefly seek for their prey, which is exclusively fish, at twilight or in stormy days. They breed socially, forming their nest in the ground, which they excavate by means of the sharp nails of their feet. The female lays one egg. The young, when excluded from the shell, is covered with a long down. They are found in all the high latitudes, furnishing the wretched inhabitants of these frozen climates with food and clothing.

PUGATSCHEFF, JEMELJAN; the son of a Cossack, born at Simoweisk, a village on the Don, in 1726, played for a short time, an important part in Russia. War and robbery were the employments of his youth, and he became the leader of a predatory band. He afterwards entered the Prussian service during the seven years' war; then joined the Austrians, served against the Turks, and was present at the siege of Bender (1770). Returning to his native country, he attempted to sow the seeds of rebellion among his countrymen, but was soon arrested and confined at Kasan. Having made his escape, he was joined by some restless spirits, and was encouraged, by his personal resemblance to the lately deceased emperor, Peter III., to attempt to pass himself off for that emperor. His adherents pretended that the corpse which had been exposed as Peter's was in fact that of a soldier resembling him; that the emperor had escaped in disguise, and had at last appeared in the midst of his faithful Cossacks, by whose support he expected to be restored to the throne. The insurrection began in the middle of August, 1773, when a manifesto was issued in the name of the pseudo-Peter. The number of his followers, which was at first only nine, had increased in September to 300. He was every where joined by his countrymen and the peasantry, to whom he promised deliverance from their oppressions. His force was increased by 500 deserters from the garrison of Jaizkai, and many Roskolnicks (q. v.), and he took several fortresses, practising the most shocking cruelties. His army now amounted to 16,000 men, and was gaining strength by the concourse of Bashkirs, Watiaks, Tartars, &c. He captured Kasan, the old capital of the empire, and passed the Volga. He was at length defeated, at the moment that Moscow was threatened, betrayed by his followers to Suwaroff, and June 10, 1775, executed, together with the other rebel leaders, at Moscow—the only instance of capital punishment in the reign of Catharine. Thus ended this rebellion, which cost more than 100,000 lives.

PUGET, PIERRE, a celebrated French sculptor, architect, and painter, born at Marseilles in 1622, was at an early age placed with a ship-builder, but soon after went to Italy, and displayed such marks of talents as to attract the notice of Cortona, who instructed him in painting. He returned to Marseilles in 1643; and there are several pictures from his pencil at Aix, Toulouse, and Marseilles, which are much admired. His design is correct, and his figures graceful, but his colouring is cold. In 1655, being obliged by his health to abandon painting, he thenceforward devoted himself to sculpture and archictecture, in which he received no instruction. His success in these departments of art was complete. He lived some time at Genoa, where he executed numerous works in statuary and architecture, and, in 1669, was recalled to France by Colbert, as director of the ornaments of ships of war, in which capacity he was employed in carving figures, bass-reliefs, &c. But he soon returned to labours more worthy of his genius, and produced a great number of works in marble, which have gained for him the appellation of the Michael Angelo of France. Puget died at Marseilles in 1694.

PUGILISM. See *Gymnastics*.

PUGLIA. See *Apulia*.

PULAWSKI, COUNT JOSEPH; a distinguished Pole, who, after attempting in vain to restore the independence of his own country, entered the American service. Pulawski had followed the profession of the law, and, in 1768, was at the head of the patriots who formed the confederation of Bar. Eight noblemen only constituted the first assembly of that confederation, and of these three were the sons, and one the nephew of Pulawski. (See *Poland*.) In 1771, at the head of a few accomplices, he seized the person of the king (see *Poniatowski*); but, the latter having procured his liberation, Pulawski was condemned to death, and obliged to save himself by flight. He soon after went to America, and offered his services to the United States against the mother country. Being appointed brigadier-general in the American service, he served both in the northern and in the southern army. October 9, 1779, he was mortally wounded in the attack on Savannah, and died two days afterwards.

PULCI, LUIGI, an Italian poet, born at Florence in 1431, was the youngest of three brothers distinguished for their talents and learning. Of the circumstances of his life we know nothing but that he lived in terms of intimacy with Lorenzo de'Medici and Politian. His epic poem, *Il Morgante Maggiore*, in which he relates the adventures and exploits of Rinaldo and the giant Morgante, is said to have been written at the suggestion of Lorenzo's mother, and to have been read, as an entertainment, at table. Pulci cannot bear a comparison with Ariosto and Tasso; he cannot be denied to possess fancy, but he wants taste and judgment. His mixture of the grave, lofty, and sacred, with the mean and burlesque, which is offensive to modern taste, was in accordance with the spirit of his age. His style is rich in pure Tuscan modes of expression, but his versification is rude and clumsy. Lord Byron translated this work of Pulci's.—His brother *Bernardo* was the author of some elegies and short poems.—Another brother, *Luca*, wrote heroic epistles, a pastoral romance (*Driadeo d Amore*), and an epic romance, probably the first in Italian (*Il Ciriffo Calvaneo*).

PULCINELLA. See *Punchinello*.

PULLEY. See *Mechanics*.

PULMONARY CONSUMPTION. See *Consumption*.

PULO PINANG. See *Prince of Wales's Island*.

PULQUE, or OCTLI; a favourite drink of the Mexicans, extracted from the maguey, or *agave Mexicana*. At the moment of efflorescence, the flower-stalk is extirpated, and the juice destined to form the fruit flows into the cavity thus formed, and is taken out two or three times a day for four or five months. The sap in this state is called *aguamiel* (honey-water), and, when allowed to ferment about twelve or fifteen days, forms *madre pulque*, or mother of pulque. This is used as a leaven. A small quantity, being placed in a vessel of the aguamiel, produces a fermentation, and renders it pulque, in the best state for drinking, in twenty-four hours. It is a cool, refreshing drink, and its intoxicating qualities are slight.

PULSE (from the Latin *pulsus*, a beating, a blow); the motion of an artery, consisting of its alternate expansion and contraction, which, in practice, is considered as a beating. This motion is the strongest in the heart, which is the centre of the arterial system, and from it is propagated through all the minutest branches of the arteries. In those which lie immediately under the skin, it can be felt with the finger, as is the case with the radial artery, the pulsation of which is very perceptible at the wrist. (See *Blood*, and *Heart*.) The state of the pulse is, therefore, an indication of the action of the heart and the whole arterial system, and of the condition of the blood, and the physical functions in general. The circumstances to be attended to in the pulse are either the number of pulsations which take place in a given time, and the regularity or irregularity of their occurrence, or the character of each pulsation. In the former case, the pulse is said to be quick or slow, according to the number of pulsations in a given interval; regular or irregular, as they occur at equal or unequal intervals. In the latter case, it is strong or weak, hard or soft, full or small, &c. It is affected by the age, sex, and temperament of the individual, and by accidental circumstances, as sleep, food, exercise, heat, &c. The pulse is most rapid in childhood, making from 100 to 110 beats in a minute, and is regular, and rather soft and small. In youth, it is much less rapid, making not far from ninety beats a minute. At this period, it is regular, strong, rather soft than hard, moderately full. In mature age, the number of beats is about seventy-five per minute, and the pulse is regular, strong, or moderate, fluctuating between hard and soft, between full and small. In old age, the number of beats sinks to sixty. The pulse is sometimes irregular, strong, but slow, hard, rather full than small. In the female sex, it is more rapid, softer, and smaller than in the male. In the *sanguine* temperament (so called), it is quicker, fuller, softer; in the choleric, slower, harder, stronger; in the phlegmatic, slower, weaker, softer, fuller; in the melancholy, slow, hard, and strong. A vegetable diet makes it slow, weak, full, soft; a meat diet, spices, spirituous liquors, make it quick and hard. In a pure, clear, air, it is quick; in damp, impure air, slow and languid. Sudden agitation and violent passions make it rapid and irregular; joy makes it quick and strong; long-continued grief languid and soft. The pulse is, therefore, a highly important indication of the state of the system. A deviation from the regular pulse of an individual indicates a disordered state. When the irritability of the system is so heightened as to produce fever or inflammation, the pulse is accelerated. If the action of the nervous system is irregular, or unduly heightened, the pulse becomes frequent and irregular, as in the case of cramps and a diseased irritation in the abdomen, from worms, &c., and in hypochondriacal and hysterical persons. In case of mechanical obstructions to the circulation, as in dropsy of the pericardium, polypus in the heart, or in the great arteries, the pulse is irregular and interrupted. It is doubtful whether Hippocrates had any knowledge of the pulse. Soon after his time, however, physicians, especially those of the Alexandrian school, were attentive to it. Aretæus of Cappadocia explained the pulsation as a motion occasioned by a natural and involuntary extension of the warmth belonging to the heart and arteries, by which their own motion is occasioned; and Athenæus of Cilicia had given the same explanation before him. He describes the various kinds of pulse connected with different disorders. Galen wrote several works on the pulse. For several centuries after, the doctrine of pulsation remained much as he had left it, as was the case, indeed, with many branches of medical science. The demonstrations of the circulation of the blood by Harvey, and of the irritability of the muscular fibre by Haller, threw new light on this subject. The feeling of the pulse is the principal examination which Chinese physicians make of the state of their patients, and they discriminate its different states with a subtilty approaching absurdity.

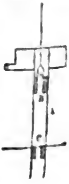
PULTAWA, or POLTAWA; a fortified town of Russia, on the river Worskla, capital of a government of the same name; lat. 49° 30′ N.; lon. 34° 14′ E.; 450 miles south-west of Moscow; population 9000. June 27, 1709, Peter the Great (see *Peter I.*) defeated Charles XII. (q. v.) before Pultawa. In commemoration of this victory, the Russians have erected a column in the city, and an obelisk on the field of battle.

PULTENEY, William, earl of Bath, an English statesman, the political antagonist of Sir Robert Walpole, was descended from an ancient family, and was born in 1682. He became a student of Christ-church, Oxford, and, after having travelled abroad, returned home to devote himself to politics. Being chosen a member of the house of commons, he joined the party of the whigs, in the latter years of the reign of Anne. Under George I. he was made secretary at war; but a dispute with Sir Robert Walpole caused his removal to the ranks of the opposition, when he joined lord Bolingbroke in conducting an anti-ministerial journal called the *Craftsman*. In 1731, a duel with lord Hervey gave offence to the king, who removed Mr Pulteney from the office of privy-counseller, which he had hitherto held, and also from the commission of the peace. These and other marks of the displeasure of the court only served to increase the popularity of Pulteney, who, at length, succeeded in procuring the resignation of his rival, Walpole, in 1741. The party with which he had acted then came into power, and he was raised to the peerage by the title of *earl of Bath*. From that period, however his popularity and influence entirely ceased. He died June 8, 1764.

PUMA (*felis concolor et discolor*). This animal is also known under the names of *couguar*, *panther*, &c., and is the largest animal of the cat kind found in America. The puma is of a brownish-red colour, with small patches of rather a deeper tint, which are only observable in certain lights, and disappear entirely as the animal advances in age. The belly is pale-reddish; the breast, inside of the thighs and legs, of a reddish-white, and the lower jaw and throat entirely white. The puma was formerly found in most parts of the American continent, and is still numerous in South America; in the United States, the advance of population has rendered it scarce. It is a savage and destructive animal, though possessing all the timidity and caution of the cat kind. It can climb trees with great facility. In the day time, it is seldom seen, the night being the time it selects for committing its depredations. Although it generally confines its attacks to the smaller quadrupeds, it will sometimes assail those of large size and strength, and even man himself. The puma is said to be readily tamed, and may even be rendered docile and obedient. When domesticated, its manners closely resemble those of the common cat, having the same fondness of being caressed, and expressing its satisfaction by the same kind of gentle purring. Mr Kean, the tragedian, possessed an individual of this species, which was so tame as to follow him about like a dog. It should, however, be noticed that docility and submission in the cat kind are only apparent: man has never been able to subject them as he has other animals. Even down to the domestic cat, there is no one of them that can bear to be thwarted; and they also manifest their native ferocity on the slightest opposition to their desires or caprices, and, unlike the dog, never appear to entertain a personal attachment to their master. See *Cat*.

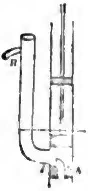
PUMICE. See *Pitchstone*.

PUMP, in the common acceptation of the term, is a contrivance for raising fluids by atmospheric pressure. (See *Hydronamics*, and *Air*.) The operation and the construction of the air-pump are explained in a separate article. There are three kinds of pumps used for raising water, of all of which there are various modifications. The simplest and most common pump is the ordinary lift, or sucking, or household pump. It is of great antiquity, its invention being ascribed to Ctesibius of Alexandria, about 120 B. C. The annexed Figure is a section of the common *suction* pump. This pump consists of a hollow cylinder A, of wood or metal, which contains a piston B, stuffed so as to move up or down in the cylinder easily, and yet be air-tight: to this piston there is attached a rod which will reach at least to the top of the cylinder when the piston

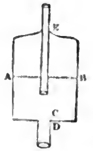


is at the bottom. In the piston there is a valve which opens upwards, and at the bottom of the cylinder there is another valve C also rising upwards, and which covers the orifice of a tube fixed to the bottom of the cylinder, and reaching to the well from whence the water is to be drawn. This tube is commonly called the *suction* tube, and the cylinder, the *body* of the pump. When the piston is at the bottom of the cylinder, there can be no air, or at least very little between it and the valve C, for as the piston was pushed down, the valve in it would allow the air to escape, instead of being condensed, and when it is drawn up, the pressure of the air would shut the valve, and there would be a vacuum produced in the body of the cylinder when the piston arrived at the top. But the air in the cylinder being very much rarefied, the pressure of the valve C on the water at the bottom will be greatly less than that of the external atmosphere on the surface of the water in the well; therefore, the water will be pressed up the pump to a height not exceeding 32 or 33 feet. As the valves shut downwards, the water is prevented from returning, and the same operation being repeated, the water may be raised to any height, not exceeding the above limit, in any quantity. The quantity of water discharged in a given time, is determined by considering that at each stroke of the piston a quantity is discharged equal to a cylinder whose base is the area of a cross section of the body of the pump, and height the play of the piston. The piston, throughout its ascent, has to overcome a resistance equal to the weight of a column of water, having the same base as the area of the piston, and a height equal to the height of the water in the body of the pump above the water in the well.

The *lifting* pump. This pump, like the suction pump, has two valves and a piston, both opening upwards; but the valve in the cylinder instead of being placed at the bottom of the cylinder is placed in the body of it, and at the height where the water is intended to be delivered. The bottom of the pump is thrust into the well a considerable way, and if the piston be supposed to be at the bottom, it is plain, that as its valve opens upwards, there will be no obstruction to the water rising in the cylinder to the height which it is in the well; for by the principles of Hydrostatics, water will always endeavour to come to a level. Now when the piston is drawn up, the valve in it will shut, and the water in the cylinder will be lifted up; the valve in the barrel will be opened, and the water will pass through it, and cannot return as the valve opens upwards;—another stroke of the piston repeats the same process, and in this way the water is raised from the well: but the height to which it may be raised is not in this as in the suction pump limited to 32 or 33 feet. To ascertain the force necessary to work this pump, we are to consider that the piston lifts a column of water whose base is the area of the piston, and height the distance between the level of the water in the well and the spout, at which the water is delivered.



In the *forcing* pump the piston has no valve, but there is a valve at the bottom of the cylinder as seen at A. In the side of the cylinder, and immediately above the valve B, there is another valve A opening outwards into a tube, which is bent upwards to the height H, at which the water is to be delivered. When the piston is raised, the valve in the bottom of the pump opens, and a vacuum being produced, the water is pressed up into the pump on the principle of the sucking pump. But when the piston is pressed down, the valve A at the bottom shuts, and the valve B at the side which leads into the ejection pipe opens, and the water is forced up the tube. When the piston is raised again the valve B shuts, and the valve A opens. The same process is repeated, and the water is thrown out at every descent of the piston, the discharge therefore is not constant.



It is frequently required that the discharge from the pump should be continuous, and this is effected by fixing to the top of the eduction pipe an air vessel. This air vessel consists of a box AB, in the bottom of which there is a valve C opening upwards into the box. This valve covers the top of the eduction pipe D. A tube, E, is fastened into the top of the box, which reaches nearly to the bottom of the box, it rises out of the box, and is furnished with a stop cock. If the stop cock be shut, and the water be sent by the action of the pump into the air vessel, it cannot return in consequence of the shutting of the valve C; and because of the space occupied by the water, the air in the box is condensed, and will therefore exert a pressure on the water in the air vessel. If the water fill three-fourths of the box, then the air will be compressed so as to exert four times the pressure that it did while the box or air vessel remained empty of water, and will, therefore, according to the law of Marriote, force the water up the tube E, and the result will be that a continuous jet will issue from the upper orifice of that tube. Large air vessels are now employed in Blowing Engines, instead of the apparatus on the hydro-pneumatic principle described in the article *Blowing Engine*. The fire-engine (q. v.) consists of two forcing pumps, working into one common air-vessel, placed between them, and from which the spouting pipe for directing the water proceeds. The chain pump used in the navy is an upright barrel, through which leathers strung on a chain are drawn by means of wheels or drums in constant succession, carrying the water in a continual stream before them. They are employed only when a large quantity of water is to be raised, and must be worked rapidly to produce any effect.

PUMPERNICKEL; a coarse, heavy, brown bread, made, in Westphalia, of unbolted rye. It is baked in large loaves, sometimes weighing sixty pounds. The following account of the derivation of the word is given:—A French traveller in Westphalia, on asking for bread, was presented with some of this kind, on which he observed that such stuff was *bon pour nickel* (good for Nickel, i. e. either his horse or his servant);—whence it came to be called *pompernicker*, or *pumpernickel*. The story is obviously made to fit the case. In fact, it is called by the inhabitants *grobes brot*, the former name being only used by foreigners.

PUMPKIN, or POMION (*cucurbita pepo*); a species of gourd, or squash, distinguished from most varieties of the latter by the rounded form of the fruit, which sometimes grows to an enormous size. It has hispid, branching, and prostrate stems, which, in good soil, will cover an eighth part of an acre. The fruit is esteemed inferior to most varieties of the squash, but, notwithstanding, is very commonly cultivated, both in Europe and America.

PUN; a play upon words, the wit of which depends on a resemblance between two words of different and perhaps contrary significations, or on the use of the same word in different senses; as in the well-known story of the man who, being requested to make a pun, asked for a subject, and was told to take the king, upon which he replied that the king was no subject. The Greeks and Romans sometimes used puns, even in serious discourses; but the moderns restrict them to light conversation, devices, symbols, rebuses, mottoes, &c.

PUNCH. See *Punchinello* and *Puppet Shows.*

PUNCHEON; a little block or piece of steel, on one end whereof is some figure, letter or mark, engraved either in *creux* or *relievo*, impressions of which are taken on metal or some other matter, by striking it with a hammer on the end not engraved. There are various kinds of these puncheons used in the mechanical arts; such, for instance, are those of goldsmiths, cutlers, pewterers, &c.

PUNCHINELLO, or PUNCH (from *pulcinello*), an Italian mask. The abbate Galiani derives the name from a misshapen but humorous peasant from Sorento, who had received it (about the middle of the seventeenth century) from his bringing chickens (*pulcinelle*) to market in Naples, and who, after his death, was brought upon the theatre *San Carlo* for the amusement of the people, to whom he was well known. According to another account, a company of actors, which went to Acerra at the time of the vintage, was attacked by the peasants (with whom the vintage is a season of festivity), with a sally of jokes and gibes, in which a certain Puccio d'Aniello among the peasants attracted notice by his comical humour and grotesque appearance, being hunched before and behind. The players had to yield to him; and, when the contest was over, they determined to take advantage of the talent of Puccio d'Aniello, and persuaded him to join their company. He appeared on the stage in a white robe, and large, full shirt, with long hair, and soon became such a favourite of the Neapolitans that his mask was retained after his death; and his successor to resemble him the more, chose a mask with a long black nose. From his name was formed, according to Neapolitan custom, *Pulcinello*. Perhaps, however, this mask was only a modification of an older one, which some have derived from the ancient *Atellanæ* (q. v.), and have thought that they discovered the grotesque figure of Punch on ancient vases. This mask is still the delight of the Neapolitans. The dress at present consists of wide drawers of white woollen, a large upper garment of the same material, with wide sleeves, fastened with a black leather belt, or hair cord. This upper garment is sprinkled over with hearts of red cloth, and it is trimmed round the bottom with a fringe. Around his neck Pulcinella wears a linen ruffle; on his head a white woollen cap, with its long point terminating in red tuft; three-fourths of the face are covered with a black mask; the nose is curved and pointed, like a bird's beak. This mask speaks the dialect of the peasants, and figures, not merely in the theatre, but at all the popular festivals in Naples, especially during the carnival. See *Mask* and *Harlequin*.

PUNCTUATION, or INTERPUNCTION; the art of employing certain signs, by means of which the parts of a discourse are connected or separated, as the sense requires, and the elevation, depression, or suspension of the voice indicated (from *interpungere*, to point). Punctuation serves both to render the meaning intelligible, and to aid the oral delivery. The system of punctuation is peculiar to the modern languages of Europe. The Eastern languages have signs to regulate the tones, but they have no punctuation. The Romans were, indeed, acquainted with the term, (Cic., *De Oratore*, iii. 44 and 46, and Seneca, *Ep.*, 40,) but with them it had a totally different signification. Their points as well as those of the Greeks, were almost entirely oratorical, i. e. confined to the delivery and pronunciation of the words; and there were often no points, or, at most, only one at the end of a sentence; or pauses were indicated by breaking up the matter into lines or paragraphs, (*versus στιχοι*.) Modern punctuation, which is, for the most part, grammatical, is of a later origin, and the invention has been attributed to the Alexandrian grammarian, Aristophanes, after whom it was improved by succeeding grammarians; but it was so entirely lost in the time of Charlemagne, that he found it necessary to have it restored by Warnefried and Alcuin. It consisted at first of only one point, used in three ways, (*στιγμη*; hence, in diplomatics, *stigmeology*, the art of punctuation,) and sometimes of a stroke, both being formed in several different ways. But, as no particular rules were followed in the use of these signs, punctuation was exceedingly uncertain until the end of the fifteenth century, when the learned Venetian printers, the Manutii, increased the number of the signs, and established some fixed rules for their application. These were so generally adopted, that we may consider them as the inventors of the present method of punctuation; and although modern grammarians have introduced some improvements, nothing but some particular rules have been added since that time. See *Hebrew Language* and *Manuscripts*.

PUNDIT. See *Pandit*.

PUNIC, (originally *Phœnician*, from *Pœni*, Phœnicians;) Carthaginian, because Carthage was a Phœnician colony.—*Punic wars*; wars between Rome and Carthage. (See those articles, and *Hannibal*.)—*Punic faith*, (*fides Punica*;) among the Romans, a proverbial expression for faithlessness.

PUPA. See *Papilio* and *Insects*.

PUPIL. See *Eye*.

PUPPET SHOWS. One of the most common classes of puppets are called, in French, *marionettes* (from *morio*, fool, buffoon, as Frisch supposes.) These are images of the human figure moved by wires or threads on a stage, and made to perform little dramas. In the common street performance of Punch and Judy, however, the performer puts his fingers in the figures. Puppet shows were common among the Greeks, (who called them *νευροσπαστα*,) from whom the Romans received them. Xenophon, Aristotle, Gellius, Horace, and others mention them. Such exhibitions, which are so pleasing to children and the uneducated, naturally passed though various degrees of perfection in different ages, and even now, exhibitions of puppets are common in some countries, which display great mechanical ingenuity, while the poor hand-organ boy in the street still turns his instrument, and gives to one or two figures on a board before him a few simple motions with his foot. Clocks for the peasants often display movable puppets, and it is not unfrequent in Germany to find on ancient town clocks puppets which move whenever the clock strikes. In 1674, there was a puppet opera at Paris, which met with great applause. In several large cities of Italy, puppet shows are performed at present, (e. g. at Milan, in the *Teatro Girolamo* which is visited by the better classes.) In Germany, also, excellent puppet shows are sometimes seen, but they are there hardly ever stationary, and are not by any means so much patronized as in Italy. As itinerary puppet shows have often given cause to scandal, several governments do not allow them but by special license (e. g. those of Prussia and Denmark.) The censorship, which limits their sphere, often does much injury to their effect, as the manager of the puppet show is thus precluded from availing himself of the momentary inspiration of his muse, when he assists the performance by his voice, as is always the case in the ordinary puppet shows. For more particulars, see Beckmann's interesting *History of Inventions and Discoveries*. See, also, *Punchinello* and *Automaton*.

PURANAS. See *Indian Literature*.

PURCELL, Henry, an English musical composer, was the son of a musician of the chapel royal, who, dying in 1664, left him an orphan in his sixth year. He was admitted at an early age, a chorister in the king's chapel, where he studied music under captain Cook and his successor Pelham Humphrey, and afterwards under doctor Blow. In 1676, when only eighteen years old, he was made organist to Westminster Abbey, and six years afterwards, at the chapel royal St. James's. From this period his fame seems to have increased rapidly, his anthems and church music in general being popular in all the cathedrals of the kingdom, nor were his compositions for the stage and music rooms less successful. His genius embraced every species of composition with equal facility; and with respect to chamber music, all prior productions seem to have been at once totally superseded. Of his numerous compositions, his celebrated *Te Deum* and *Jubilate* appear to have been composed for the celebration of St. Cecilia's day, 1694. Of his instrumental music, a collection was published two years after his decease, containing airs in four parts, for two violins, tenor, and bass. Many of his songs were published after his death, under the title of *Orpheus Britannicus*. *Ye twice ten hundred Deities*, contained in this collection, is considered the finest piece of recitative in the language; while his music in King Arthur has maintained its popularity undiminished above a century. In 1695, the year of his death, he set to music Bonduca, and the Prophetess, an opera altered by Dryden from Beaumont and Fletcher; and he was the author of a vast variety of catches, rounds, glees, &c., not less remarkable for their melody than for their spirit, humour, and originality. He died in 1695.

PURCHAS, Samuel, an English divine, was born in 1577, at Thaxtead, in Essex, and educated at Cambridge. His principal work was entitled Purchas his Pilgrimages, or Relations of the World, (5 vols., fol.,) which, with Hakluyt's Voyages, led the way to other collections of the same kind, and have been much valued and esteemed. The first volume was published in 1614; but the fourth edition of it, in 1626, contains numerous important additions. The four last volumes appeared in 1625. He also wrote Microcosmos, or the History of Man, (8vo.;) the King's Tower and Triumphal Arch of London. Mr Purchas was rector of St. Martin's in Ludgate, and chaplain to Abbot, archbishop of Canterbury. He died in London in 1628.

PURCHASE, in law; the acquiring of land with money, by deed or agreement, and not by descent or right of inheritance. *Purchase* is also a name given to any sort of mechanical power employed in raising or removing heavy bodies.

PURGATORY, according to the dogma of the Roman Catholic Church; a place of purification, in which, after death, those souls are cleansed, which are not sufficiently pure to enjoy the happiness of heaven. The council of Trent confirmed this doctrine, as sanctioned by Holy Scripture and tradition. The Protestants and the Greek Church do not receive it. The passages of Scripture on which this article of faith is founded are Revelations xxi. 27; 2 Maccabees xii. 38; Matthew xxv.; Luke xii. 58; and 1 Corinthians iii. 2. Origen and Augustine among the fathers, have been most full upon this point, upon which later Catholic theologians dwelt with still more minuteness. They teach that it is situated on the borders of the infernal pit; that a spark of its fires causes more suffering than any bodily pain; that every soul is purified in it, the members which have sinned being burned in its flames; and that, by masses for the deceased, their sufferings may be mitigated, and the time of their punishment shortened. The origin of this notion is to be traced to the doctrine of Plato, that there was a state of purification after death, which was introduced by the fathers of the church, particularly Clement of Alexandria, into the Christian system. Gregory the Great gave to this article a further extension, and employed it for the profit of the church. The council of Florence (1439) was the first in which the doctrine of purgatory was mentioned; the monstrous perversions which it had suffered in the hands of the monks, made it a prominent object of attack to the Protestants.

Purgatory (written by a German Catholic.) The doctrine of a state of future purification was closely connected by the ancients with that of the transmigration of souls, which, as it first prevailed among the Egyptians, was nothing more than a symbolical representation of the immortality of the soul. Succeeding philosophers made use of this doctrine of transmigration, to deter rude tribes from sin, by connecting their future condition with that of the various species of animals, which was well fitted to strike unreflecting natures. It was afterwards unhappily chosen to indicate the mode of the purification of the soul and its preparation for the joys of heaven. Plato did more than is usually believed to develope this doctrine. Such a middle state is consistent with reason, since there are men who, at death, are not deserving of the joys of heaven, nor of the punishments of hell; and the doctrine accords with the spirit of the Christian revelation, which represents the holiness of God, and declares that without holiness no one can see, i. e. be united with him, (*Hebrews* xii.) and describes the purity which is required for admission to his presence, (*Revelation* xxi. 27.) The Jews had this doctrine. Judas the Maccabee caused prayers and victims to be offered for the warriors who had fallen in sin, that their sins might be pardoned, and they obtain the reward promised to those who die in piety, (2 *Maccabees* xii.) Christ confirmed this doctrine, when he (*Matthew* xii. 31, 32) spoke of the sins which were forgiven neither in this world nor in the next, and thus implied that such a forgiveness was in general attainable in another life. Christianity is far from pronouncing the severe doctrine, that eternal damnation is the portion of all Christians who have incurred the slightest sin. John (1 *John* v. 16, 17.) says expressly that all unrighteousness is sin, but not all mortal sin. In what way the purification of the less guilty is to take place, is not known; and the church has never acknowledged the notions of physical pain which many have on this subject. If brotherly love bids us pray for the good of our fellow men, (*James* v. 16.) should it not impel us to pray for those of our brethren who may have so lived on earth as to be excluded from perfect happiness? It is impossible to prove that such prayers are wholly ineffectual. That the Jewish church prayed for the dead, appears from the passage in Maccabees above referred to. And in the oldest documents of Christian antiquity, we find this prayer as something common and unquestioned. Not only is it clearly proved to have existed from private accounts, but in all liturgies, which contain the general belief of the churches, this prayer for the dead appears. The fathers of the church were always of this opinion. There is certainly something consoling in the thought, that we may be of assistance to our departed friends; this feeling was expressed by the Romans in the wish, *Sit tibi terra levis!* The Catholic faith considers as one body, both those who are struggling here and those who exist in another life. Love unites all, and love teaches the pilgrims on earth to pray for the dead not yet made perfect. No one acquainted with the history of the sale of indulgences, can doubt that the views of future purification and of prayers for the dead, have been shamefully perverted for the purpose of gain. The council of Trent, therefore, while it maintained the decree *de purgatorio*, passed at its twenty-fifth session, added the following ordinance, but did not prescribe it as a point of faith: "Since the holy Catholic church, instructed by the Holy Spirit, and by the Holy Scriptures, and by the primitive traditions transmitted from the fathers of the church, through synods and councils, has taught that there is a place of purification, and that the souls confined there are aided by the prayers of the faithful, and especially by the offering of the sacrament of the altar, the council commands the bishop to take care that the doctrine of a place of purification is taught and preached as it has been handed down from holy fathers and councils. The preachers shall not speak to the people of the more difficult and subtle questions, which edify not, and which, for the most part, do not contribute to piety; likewise they shall not allow that which is doubtful, or probably false, to be treated of and spread abroad. Whatever is dictated merely by curiosity or superstition, or is connected with shameful gain, they shall forbid as wickedness, as offensive to true believers."

PURITANS, in the English church; a sect who professed to follow the pure Word of God, in opposition to traditions, human constitutions, and other authorities. In the reign of queen Elizabeth, the Protestants were divided into two parties, those who were in favour of adhering to the liturgy established in the reign of Edward, and those who wished to introduce a simpler, and, as they considered it, a purer form of church government and worship. The latter were termed *Puritans*, and many of the distinguished clergy favoured these views. The queen, however, and a majority of the clergy, preferred the Episcopal form of government, and were attached to many forms and ceremonies upon which the Puritans looked with aversion. The rigorous measures followed by the dominant party to compel conformity, only served to alienate the Puritanical party, and to push them into more decided opposition to the ceremonials of divine worship. In 1566, the Puritans resolved that duty required them to break off from the church, and assemble, as they best could, by themselves, to worship God in their own way; they also laid aside the English liturgy, and adopted the Geneva service-book. They objected further to the hierarchy, as not authorized by Scripture, to kneeling at the sacraments, using the sign of the cross in baptism, bowing at the name of Jesus, wearing the surplice and other vestments in divine service, &c. In point of doctrine there was as yet no difference between the Puritans and Conformists; the former, however, as was natural for a persecuted party, maintained that every man had a natural right to judge for himself, without being subject to the laws of the civil magistrate, or the decrees of councils, churches, or synods. Towards the end of Elizabeth's reign, a party arose which were first for softening, and then for overthrowing, the received opinions concerning predestination, perseverance, free will, effectual grace, and the extent of Christ's redemption. The clergy of the church began to lean towards Arminianism, while the Puritans adhered rigorously to the system of Calvin, and all Calvinists, whether Episcopal or Presbyterian, were called *doctrinal Puritans*. The name was applied to all who were remarkably strict in their morals, and severe in manners. Elizabeth treated the Puritans with great rigour during the whole of her reign; besides the ordinary courts of the bishops, she erected the court of high commission, which suspended and deprived the refractory of their livings, by the determination of three commissioners, founded upon the canon law; before this court the prisoner was obliged to answer questions put to him, under oath; if he refused to swear, he was imprisoned for contempt, and if he took the oath, he was convicted upon his own confession. During the reign of James I., from whom the Puritans had expected more indulgence, they were treated with greater severity, and many of them left the kingdom and retired to Holland, whence they emigrated to America in 1620. (See *Plymouth.*) All were looked upon by James and the court as *Puritans*, who opposed the arbitrary maxims of his government; and these were called *Puritans* in state, who, uniting with the others Puritans, in opposition to the tyrannical principles of the Stuart dynasty, formed a majority in the nation. The success of the first emigrators to America, who established the colony of New Plymouth, induced great numbers of Puritans to turn to the same quarter for relief, and the New colony of Massachusetts Bay was founded by them in 1628. (See *New England.*) The colony of New Haven was also founded by Puritans, who fled from the persecutions of Laud, and the oppressions of the star chamber and the high commission courts. Though there were shades of difference in these fugitives to America, they agreed in most points of doctrine and discipline, and most of their descendants in New England, of which they compose the principal part of the population, still cherish with fondness the maxims and the memory of their Puritan fathers. (See *Independents.*) The Puritans were afterwards prevented from retiring to America, and many of them removed into Holland, while others remained at home, and finally pulled down the throne and the altar, which long persecution had rendered so odious to them. (See *Cromwell*, *Hampden*, *Pym*, &c.) It was the union of the three kinds of Puritans above-mentioned, which gave the parliament the victory in the civil war which followed. (See *Charles I.*) The Presbyterian party was at first the most powerful, but the Independents, among whom were Cromwell, Milton, &c., finally acquired the ascendancy; and it was this party, most of whom were republicans in politics as well as in church discipline, that beheaded the king and abolished royalty. After the restoration of Charles II., the act of uniformity (1662) excluded from the communion of the church all who refused to observe the rites and subscribe the doctrines of the church of England; and from that time the name of *non-conformists* was applied to such recusants as, for instance, Presbyterians, Independents, Quakers, &c. (See *Non-conformists*, and *England, Church of.*) For a complete history of the Puritans, the reader may consult Neal's History of the Puritans (4 vols., 8vo., 1732—38; new ed. 5 vols., 1797.)

PURPLE. The colour to which the ancients applied the name *purple*, was either dark, or violet and rose-coloured, and was one of the most costly dyes with which they were acquainted. They obtained their purple dyes partly from plants, and partly from several kinds of shell fish, as the *buccinum* (a species of muscle), and the *purpura*, or purple fish. In modern times, a similar purple matter has been found in several other shell fish. It is a viscous juice, contained in a little pouch or bag, lying generally between the heart and liver. The colour of the juice varies, being in some purplish red, in others pale yellow or orange coloured. Réaumur found that the juice taken from the *buccinum*, on being applied to linen, changed, in the course of a few seconds, from yellow to green, blue, and finally to purplish red. The juice of the *sea-snail*, found by the Spaniards in Peru, and used for dyeing, presents similar phenomena. Cochineal is used for purple dyes by the moderns, and has the advantage that it strikes equally well on silks and woollen stuffs; while the ancients used their purple only on cotton and woollen. The ancients attributed the invention of purple to the Phœnicians. The story of its having been discovered by a dog's biting a purple fish, and thus staining his mouth, is well known. The purple fish was found not only on the Phœnician coasts, but in all other parts of the Mediterranean, so that the use of it in dyeing came to be common with other nations; but the Phœnicians excelled in the beauty and permanence of their colouring. The Tyrians excelled particularly in the bright red and violet shade. They dyed the finest wools of this colour, usually twice, and then gave an artificial brilliancy to the stuff.

PURPLE GRACKLE. See *Blackbird*.

PURPLE OF CASSIUS. See *Tin*.

PURSE, among the Turks; the sum of £112, so called because the treasure in the seraglio is kept in leathern purses of this value.

PURSLANE (*portulacea oleracea*); a common and insignificant weed, said to have come originally from India, but now almost universally diffused through the civilized world. The stems divide from the base into several prostrate branches, which are clothed with sessile, smooth, and wedge-shaped leaves, the flowers are small, yellow, and axillary. The whole plant is succulent. Formerly it was cultivated as a pot-herb, for salads, garnishings, and pickling, and it is still sometimes employed for those purposes.

PURSUIVANT. See *Poursuivant*.

PUTEOLI; the ancient name for Pozzuoli. See *Naples*.

PUTREFACTION. See *Decomposition*, *Fermentation*, and *Adipocire*.

PUTTER, John Stephen, was born at Iserlohn in 1725, and made such rapid progress in his studies, that he was ready to enter the university in his thirteenth year. After studying at Marburg, Halle, and Jena, he became professor extraordinary of law at Gottingen, in 1747, and soon became distinguished as a lecturer. In 1757, he was named *professor juris publici*. Although employed in various public capacities, he still continued to reside in Gottingen, till the time of his death in 1807. His works have lost much of their importance by the dissolution of the German empire, but his *Historische Entwickelung der Verfassung der Deutschen Staaten* (3 vols.) is still valuable.

PUTTY, in the arts. When tin is melted in an open vessel, its surface soon becomes covered with a gray powder, which is an oxide of the metal. If the heat is continued, the colour of the powder gradually changes, and at last becomes yellow. In this state it is known by the name of *putty*, and employed in polishing glass and other hard substances.

PUTTY is also a kind of paste, compounded of whiting and linseed oil, beaten together to the consistence of a thick dough.

PUY DE DOME. See *Cevennes*, and *Barometer*.

PUZZOLANA. See *Pozzolana* and *Cement*.

PYGMALION; a prince of Cyprus, who, disgusted with the debaucheries of his countrywomen, took an aversion to the sex. According to Ovid (*Met.* x. 243), having made a female statue of ivory, he was so enchanted by its beauty, that he fell in love with his own work, and entreated Venus to endow it with life. His prayer was granted; the statue began to breathe and live before his eyes, and in his embrace. It became his wife, by whom he had Paphos, the founder of the city of the same name. Rousseau's opera of Pygmalion is founded on this story. Another Pygmalion, king of Tyre and Sidon, was brother of Dido.

PYGMY. The Pygmies were a fabulous nation of dwarfs, who were said to live near the sources of the Nile, or, according to some, in India. Homer mentions them as threatened with death and destruction by the cranes (*Il.* iii. 3). Later writers are more minute in their accounts. Pliny says that their towns and houses were built of eggshells; and, according to Philostratus, they cut down their corn, as one would fell a tree, with axes. The latter also speaks of an army of Pygmies, which attacked Hercules, while sleeping, after his struggle with Antæus. They made such preparations for the assault, as if they were to attack a city. But the hero, on awaking, laughed at the little warriors, wrapped them up in his lion-skin, and carried them to Eurystheus.

PYLADES; son of Strophius, king of Phocis, and Anaxibia, the sister of Agamemnon, celebrated for the friendship which existed between him and Orestes. Pylades married Electra, the sister of his friend. (See *Orestes*.)

PYLOS; a city of Elis, the residence of Nestor, now Navarino. Another Pylus in Elis was the residence of Augeas. Some, however, consider the city of Pylos in Messina as the residence of Nestor.

PYM, John, a parliamentarian in the reign of Charles I., was descended of a good family in Somersetshire, where he was born in 1584. He was educated at Pembroke college, Oxford, whence he removed to one of the inns of court, and was called to the bar, and placed as a clerk in the office of the exchequer. He was early elected member of Parliament for Tavistock in the reign of James I., and in 1626 was one of the managers of the impeachment of the duke of Buckingham. He was also a great opposer of Arminianism, being attached to Calvinistic principles. In 1639, with several other commoners and lords, he held a close correspondence with the commissioners sent to London by the Scottish covenanters; and in the parliament of 1640, was one of the most active and leading members. On the meeting of the long parliament, he made an able speech on grievances, and impeached the earl of Stafford, at whose trial he was one of the managers of the house of commons. It was the zeal and earnestness of Pym which led Charles into the imprudent measure of going to the parliament in person, to seize him and other four members. Some time before his death, he drew up a defence of his conduct, which leaves it doubtful what part he would have taken had he lived until hostilities commenced. In November, 1643, he was appointed lieutenant of the ordnance, and died Dec. 8, 1643.

PYRALLOLITE is a mineral which occurs massive and crystallized, in flat rhombic prisms, whose dimensions are not yet known with certainty. It is cleavable parallel with the sides of the rhombic prism; lustre resinous; colour greenish or yellowish-white; translucent on the edges; hardness that of arragonite; specific gravity 2.6. When reduced to powder, it phosphoresces with a bluish light. Before the blow-pipe, it first becomes black, then white, and afterwards intumesces and melts on the edges. With borax, it yields a transparent glass. It consists of silex, 56.62; magnesia, 23.38; alumine, 3.38; lime, 5.58; oxide of iron, 0.99; protoxide of manganese, 0.99; and water, 3.58; leaving 6.38 of an unknown bituminous substance, and loss. It comes from Pargas in Finland.

PYRAMID, in geometry, is a solid having any plane figure for its base, and triangles for its sides, all terminating in one common point or vertex. If the base of the pyramid is a regular figure, the solid is called a *regular* pyramid, which then takes particular names, according to the number of its sides, as *triangular*, *square*, *pentagonal*, &c., the same as the prism. (See *Prism.*) If a perpendicular from its vertex falls on the centre of the base, the solid is called a *right* pyramid, but if not, it is *oblique*. The principal properties of the pyramid may be stated as follows:—1. Every pyramid is one third of a prism of equal base and altitude. 2. Pyramids of equal bases and altitudes are equal to each other, whether the figure of their bases be similar or dissimilar. 3. Any section of a pyramid parallel to its base will be similar to the base, and these areas will be to each other as the squares of their distances from the vertex. 4. Pyramids, when their bases are equal, are to each other as their altitudes; and when their altitudes are equal, they are to each other as their bases; and when neither their bases nor their altitudes are equal, they are to each other in the compound ratio of their bases and altitudes. The solidity of a pyramid is found by multiplying its base by its perpendicular altitude, and taking one third of the product. *Frustum* of a pyramid is the solid formed by cutting off the upper part of a pyramid by a section parallel to its base.

PYRAMIDS, in architecture; colossal structures of the ancient Egyptians. According to Herodotus, this people considered the pyramidal form as an emblem of human life. The broad base was significant of the beginning, and its termination in a point, of the end, of our existence in the present state; for which reason they made use of this figure in their sepulchres. Some writers derive the word *pyramid* from πυρος (wheat, grain), and understand by it granaries, such, for instance, as those built by the patriarch Joseph; others suppose it to come from πυρ (fire), because the form of the pyramid is like an ascending flame. The name is probably derived from an old Egyptian word. Some derive it from *piramue*, a ray of the sun; others, from *pirama*, a high monument. The Egyptian pyramids (for similar buildings are found among the Babylonians, the Indians and the Mexicans) are large, quadrangular and hollow, having a broad base, contracting gradually towards the top, sometimes terminating in a point, sometimes in a plane surface, generally built of large, though not very hard limestones (seldom of brick or of any other kind of stone than limestone), of different heights, usually having a base equal to the height, with the four sides placed so as to face the four cardinal points, two of the sides usually being larger than the other two. Some maintain that they were consecrated to the sun, or some other god; others, that they served as a kind of gnomon, for astronomical observations; according to Diderot, for the preservation and transmission of historical information; according to others, they were built merely to gratify the vanity and tyranny of kings, or for the celebration of mysteries, or secret meetings, or for corn magazines, or, finally,—and this is the most common opinion of the ancients,—for sepulchres, structures in burial places, symbolical representations of the world of shades, or as chambers for mummies. Among the most renowned are those of Cheops and Cephrenes. Those now standing, all in Middle Egypt, are divided into five groups, which contain about forty pyramids. The district in which the pyramids stand, begins at Dagshoor, and extends by Sakkara and Memphis, almost to 30° N. lat., about 14,000 paces in length, and less in breadth. The group of Gize (in the neighbourhood of the ancient Memphis) is the most remarkable. Here is the largest one. Herodotus says that it has been supposed to contain the bones of Cheops, and that another one hard by covers the bones of Cephrenes, his brother and successor. The account of this ancient writer is not improbable, which says that 100,000 men worked without interruption for twenty years, in building this enormous pyramid, and that Cheops became an object of hatred to his people on this account. When Savary visited the pyramids of Gize, he obtained a guard from the governor of the district, to defend him against the Arabs. He left Gize at one o'clock in the morning, and was soon gladdened by the sight of the two largest pyramids, whose summits were illuminated by the moon. They appeared like rough, craggy peaks, piercing the clouds. At half-past four in the morning, the visitors prepared to enter the great pyramid. They laid aside part of their clothes, and each one took a torch in his hand. They began to descend a long passage, which at last became so narrow that they were obliged to creep on their hands and knees. When they had passed through this passage, they were obliged to ascend in the same way. When they had traversed this second passage, they came to a much more spacious apartment, coated with granite, at one end of which Savary saw an empty marble sarcophagus, made of one piece of stone, but without a lid. Fragments of earthen vessels were scattered over the floor. They next proceeded to a second room, which lay under the one above mentioned, and was of smaller extent. It contained the entrance to a passage which was filled up with rubbish. They now ascended through this, avoiding not without difficulty, a deep well on the left. When they reached the open air, they were all exhausted by the heat, which they had endured in the interior of the pyramids. After having rested themselves, they ascended the pyramids on the outside. They counted about 200 stone steps, varying from two to four feet in height, and they enjoyed from the summit a most delightful view of the country. The descent was much more laborious. Having reached the ground, they walked round it, and surveyed with astonishment the rough mass, which at a distance appeared smooth and regular. The form of this immense structure does not admit of a very exact measurement; the estimates which we have can only be considered as approximations. Herodotus gives 800 feet as its height, and says that this is likewise the length of its base on each side. Strabo makes it 625, Diodorus 600. Modern measurements agree most nearly with the latter. The difference of these results may be owing partly to the circumstance of their having been made at different times, and the sand having been higher at one time than another. Strabo says that the stone which closes the entrance to the pyramids, is to be found nearly in the centre of one of the sides; if this was true in his time, the soil must have been very much raised, since the entrance is not at present more than 100 feet from the ground. Herodotus says that the two largest pyramids are wholly covered with white marble; Diodorus and Pliny, that they are built of this costly material. The account of Herodotus is confirmed by present appearances. Denon, who accompanied the French expedition to Egypt, makes the following observations on the present state of the pyramids: Bonaparte had determined to examine the great pyramid of Gize; 300 persons were appointed to this duty, among whom was Denon. They approached the borders of the desert in boats to within half a league of the pyramid, by means of the canals from the Nile. The first impression made on Denon by the sight of the pyramids did not equal his expectations, for he had no objects with which to compare them; but on approaching them, and seeing men at their feet, their gigantic size became evident. The visitors ascended a small elevation of rubbish and sand, which led to the entrance of the pyramid. This opening, which, according to Denon's calculation, is about 60 feet above the ground, is concealed by a stone wall, which forms the third and innermost of the walls surrounding the pyramid. Large stones are placed horizontally at the side of the entrance, and above these, others of enormous size are so placed as to make their fall or displacement very difficult. Here begins the first entrance, leading towards the centre and the ground floor of the building. At the end of this passage, Denon says, two large blocks of granite stopped the way. Finding all endeavours to remove this obstacle useless, he went a little way back, passed round two other blocks of stone, and succeeded in climbing over them, when he discovered another passage, so steep that it was necessary to cut steps in order to ascend it. This led into a landing place, in which is a deep hole, usually called the well. It is the entrance to a horizontal passage leading to an apartment, known under the name of the queen's chamber, which is without any inscription or ornament. From the above landing place, an opening leads in a perpendicular direction to the principal passage, and this ends in a second room, where the third and last partition is found. This is built with much greater care. Finally comes the king's chamber, which contained a sarcophagus. This pyramid has been since more completely examined by Caviglia. The other pyramid of Gize—that of Cephrenes—was first opened and visited by Belzoni in 1818. In the sarcophagus of this pyramid he found some bones, which were sent to London, and, on examination, proved to be those of an animal of the bovine species. The chambers, passages, shafts, &c. resemble those of the pyramid of Cheops above described. (See Belzoni's *Researches and Operations in Egypt and Nubia.*) Beside this group, there are others, but of less magnitude, at Abousir, Sakhara, and Dashour. An account of Belzoni's and Caviglia's examinations may be found in Russell's Ancient and Modern Egypt. The singular monuments of the ancient inhabitants, found in Mexico, are also called *pyramids*. They are built of brick, disposed in layers alternating with clay, and the sides are constructed in terraces, as in that of Cholula, or of a mixture of clay and pebbles, with a coating of stone, overlaid with a plastering of lime. Those of Teotihualcan are considered to be of the eighth century. Another remarkable monument of this kind is the pyramid of Papantla, near Vera Cruz, which had been carefully concealed by the superstitious veneration of the Indians, until accidentally discovered about sixty years ago. It is constructed of large blocks of hewn porphyry, cemented with mortar, and sculptured in relief with innumerable figures, principally of serpents and alligators. Like the others before mentioned, its sides are formed into terraces, the wall above each of which contains a number of square niches, in the whole 378, being, as is supposed, intended to represent the common year, and the intercalary days at the termination of each cycle. It is about sixty feet high, and has a base eighty feet broad. See *Mexico, Antiquities of.*

PYRAMIDS, BATTLE OF THE. See *Egypt, Campaign in.*

PYRAMUS. See *Thisbe.*

PYRENEES; a range of mountains dividing France from Spain, extending, almost in a straight line, from St Sebastian on the bay of Biscay, to Port Vendres on the Mediterranean, a distance of about 250 miles. From the principal chain proceed various inferior ridges. The acclivity of the Pyrenees, on the side of Spain, is often extremely steep, presenting a succession of rugged chasms, abrupt precipices, and huge masses of naked rock; on the side of France, the ascent is more gradual. Like the Alps, they present a great variety of climate and production, and the same rapid transitions from sterility to luxuriant vegetation. They yield great quantities of timber. The mineral productions are iron, copper, lead, zinc, cobalt, and the precious metals. Some of the highest summits are Maladetta, 10,722 feet, Mont Perdu, 10,578, Vignemale, 10,332, Marboré, Pic Blanc, and Pic Long. On the Spanish side, the highest summit is the Mousset, differently estimated at from 6646 to 8461 feet high. Montserrat (q. v.) is celebrated for its monastery and hermitages. The valley of Campan is the most beautiful part of the Pyrenees. (See *Cagots.*) There are upwards of one hundred passages for pedestrians, and seven for carriages, over the mountains from one country to another. The most frequented carriage roads are from Junqueira to Perpignan, on the east; from St Sebastian to St Jean de Luz, on the west; and from Pamplona to St Jean de Pied de Port, at some distance inland. The passes in the interior are over very high ground; that at Pineda being 8248 feet above the sea. For further information, consult Ramon's *Observations sur les Pyrénées; Voyage au Mont Perdu* (1801); Melling's *Voyage pittoresque* (1825); and Labouliniére's *Voyage descriptif et pittoresque.* Charpentier's work, *Sur la Constitution géognostique des Pyrénées* (Paris, 1823) obtained the prize offered by the Paris academy of science.

PYRENEES, LOWER; UPPER PYRENEES; EASTERN PYRENEES. See *Department.*

PYRENEES, PEACE OF THE; concluded beween France and Spain by Mazarin and De Haro, on the isle of Pheasants, in the river Bidassoa, on the borders of the two countries, 7th November, 1659. After the peace of Westphalia, 1648, the war between France and Spain, which had begun 1635, still continued. France formed an alliance with England in 1657, after Cromwell had (1655) declared war against Spain, and taken several strong places in the Spanish Netherlands; Spain also suffered by sea and in America; Portugal had revolted in 1640, Catalonia was in rebellion, and Andalusia disposed to insurrection; and in Italy, Savoy had seized Spanish Lombardy. Philip IV., king of Spain, consented therefore to that peace, which confirmed the ascendency of Louis XIV. Spain ceded to France Roussillon, with the fortress of Perpignan, Conflans, and a part of the Cerdagne, so that the Pyrenees have since formed the boundary of the two kingdoms; and in the Netherlands, Artois, and part of Flanders, Hainault, and Luxemburg, with the fortified towns of Arras, Hesdin, Gravelines, Landrecy, Quesnoy, Thionville, Montmedy, Marienburg, Philippeville, &c. In 1815, France was obliged to cede the two last named fortresses to the kingdom of the Netherlands. France bound herself not to support Portugal. The prince of Condé and the dukes of Lorraine, Savoy, and Modena, and the prince of Monaco (the two first especially), were left in *statu quo*. In consequence of this peace, Louis XIV. married Maria Theresa, eldest daughter of Philip IV., who, in 1660, renounced all right of inheritance to the Spanish throne. Louis XIV., however, afterwards made pretensions to this right, from which arose the devolution war and the war of the Spanish succession. See *Aix-la-Chapelle, Peace of*, and *Utrecht, Peace of*.

PYRITES; a genus of inflammable substances, composed of sulphur, which has dissolved or saturated itself with metals. Iron pyrites according to Stromier is a compound of the Protosulphuret and Bisulphuret of iron. (See *Iron Magnetic Ore*.) Copper pyrites is a double sulphuret of iron and copper, that ore from which the copper of commerce is usually obtained.

PYRMONT, or NEUSTADT PYRMONT; a town in the principality of Waldeck, situated in a pleasant valley on the Emmer, thirty-three miles south-west of Hanover. It is well built, with delightful walks, and is famous for its thermal waters, which are yearly visited by 1800 strangers. The waters are saline. (See *Mineral Waters*.) In the vicinity are the ruins of the old castle of Pyrmont, or Schellpyrmont, and the cave called Dunsthohle, from which issues carbonic acid gas. There is also here a colony of Quakers, called Friedensthal (Vale of Peace.)

PYROCHLORE; a mineral recently detected in the zircon sienite of Fredericksværn, in Norway. It occurs crystallized in regular octahedrons; specific gravity, 4.2; scratches fluor; streak brown; fracture conchoidal, without any trace of cleavage; lustre between vitreous and resinous. Its colour is reddish brown, and on the fresh surface almost black; in thin splinters, translucent It consists of titanic acid 62.75, lime 12.85, oxide of uranium 5.18, oxide of cerium 6.80, oxide of manganese 2.75, oxide of iron 2.16, oxide of zinc 0.61, water 4.2, fluoric acid undetermined, and magnesia a trace.

PYROLIGNEOUS ACID. See *Vinegar*.

PYROMETER; an instrument for the measurement of temperatures above those which we are able to estimate by the mercurial thermometer. Mercury boils at 660°, above which point it is incapable of measuring heats; although many temperatures connected with the most common processes are greatly above this point, as, for example, the heat of a common fire, the melting point of silver, copper, and gold. The first pyrometer was that invented by Mr. Wedgewood. It consisted of small pieces of clay from Cornwall, moulded into cylinders of a determinate size, and baked in a low red heat. These pieces were of just such a size as to enter between two square brass rods, fixed on a brass plate twenty-four inches long, half an inch asunder at one extremity, and 0.3 inch at the other. The brass rods were divided into inches and tenths, making in all 240 divisions, or degrees. When pieces of clay, baked in Wedgewood's manner, are exposed to heat, they shrink in their dimensions, and the degree of shrinking was believed to be proportional to the temperature. This was the foundation of his instrument. The heat to which the piece of clay was exposed was indicated, when its shrinkage was measured between the brass rods. If exposed to the heat at which silver melts, it advanced between the brass rods to 22°, or 2.2 inches; if to the melting point of gold, to 32°; and if to the melting point of cast iron, to 130°; and so on. But this pyrometer of Wedgewood has been long laid aside, in consequence of the observation, that if a piece of this clay was long exposed to a low temperature, it shrunk as much in its dimensions as if it had been exposed for a short time to a much higher temperature. In 1803, Guyton de Morveau presented to the French institute a pyrometer of platina, which measured high temperatures by the expansion of this refractory metal. An improvement of this instrument was brought forward by Mr. Daniel in 1821, which consisted of a bar of platina 10½ inches long, and 0.14 inch in diameter. It is placed in a tube of black lead or earthen ware, and the difference between the expansion of the platina bar and the earthen ware tube is indicated on a circular scale. This pyrometer indicates a change of about 7° of Fahrenheit; or, in other words, 1° of Daniel is equal to 7° of Fahrenheit. The following are some of the results obtained by this instrument:

	Daniel.	Fahr.
Boiling point of mercury,	92°	644°
Fusing point of tin,	63	442
" " bismuth,	66	462
" " lead,	87	609
" " zinc,	94	648
" " brass,	267	1869
" " silver,	319	2233
" " copper,	364	2548
" " gold,	370	2590
" " cast iron,	497	3479
Red heat just visible in daylight,	140	980
Heat of a common fire,	163	1141

A very delicate pyrometer, was invented by the celebrated chronometer makers the Messrs Breguet. It consists of a helix formed of three metals of unequal expansibility, one plate of gold being inclosed by one of silver and another of platinum. The compound plate does not exceed one hundredth part of an inch in thickness, the top of the spiral being fixed in a firm brass stem and the bottom carrying a golden needle. When the helix expands the coil moves round and turns the needle over a graduated arch which indicates the degree of expansion. The instrument is mounted by the Parisian makers in a case the size of a thin watch, it possesses great delicacy but is little known in this country. (See *Thermometer*.)

PYROPHORUS; an artificial product, which takes fire on exposure to the air. It is prepared by several methods. The oldest way of proceeding is as follows:—Four or five parts of burnt alum are mingled with two of charcoal powder. The mixture is introduced into a vial or matrass, with a neck of about six inches long. The vial is filled about two thirds full, and put into a crucible the bottom of which is covered with sand. The body of the flask is also surrounded with sand, after which the crucible is put into a furnace, and surrounded with red-hot coals. The fire is gradually increased until the flask becomes red hot, at which temperature it is maintained for about a quarter of an hour. As soon as the vessel is become cool enough to be handled, the vial is taken out of the sand, and the contents transferred into a dry and stout glass, made warm, which must be secured with a glass stopper. Whenever this mixture is poured out in the air, it takes fire. A pyrophorus may be prepared by mixing three parts of alum with one of wheat flour, and calcining them in a vial, as in the above case. Tartrate of lead, also, on being heated in a glass tube until it becomes converted into coaly matter, gives rise to a beautiful pyrophorus. But the pyrophorus invented by doctor Hare of Philadelphia is the most remarkable.

It is formed from heating a mixture of three parts lampblack, four calcined alum and eight pearlashes, in a gun-barrel. The mixture is maintained at a cherry-red heat about one hour, or until it ceases to give off inflammable gas at the orifice of the tube, after which it is withdrawn from the furnace, and closely corked from the air. When cold, if poured from the gun-barrel into the air, it immediately glows and takes fire; and more especially if breathed upon, or slightly moistened. This pyrophorus may be preserved in its full activity for a year or more, if well corked up from the air, but it requires much caution in disengaging it from the tube; for it has been known to explode, with great violence, simply on introducing into it an iron ramrod. This compound appears to owe its energy to its containing the sulphuret of potassium.

PYROPHYSALITE. See *Topaz*.

PYROSMALITE; a lamellar substance, found also in six-sided tables, of a shining lustre; translucent; brittle; specific gravity 3.08. It is soluble in muriatic acid, with a residuum of silex. It gives out the odour of chlorine when heated before the blow-pipe, and becomes attractable by the magnet. Its constituents are peroxide of iron 21.81, protoxide of manganese 21.14, sub-muriate of iron 14.09, silex 35.85, lime 1.21, water and loss 5.9. It occurs in a bed of magnetic iron ore, along with calcareous spar and hornblende, in Bjelke's mine in Nordmark, in Wermeland.

PYROTECHNY is properly speaking, the science which teaches the management and application of fire; but, in a more limited sense, and as it is more commonly used, it refers chiefly to the composition, structure and use of artificial fire-works. The ingredients are, 1. saltpetre, purified for the purpose; 2. sulphur; and, 3. charcoal. Gunpowder is likewise used in the composition of fire-works, being first ground, or, as it is technically termed, *mealed*. Camphor and gum-benzoin are employed as ingredients in odoriferous fire-works. The proportions of the materials differ very much in different fire-works, and the utmost care and precaution are necessary in the working them to a state fit for use, and then in the mixing. When stars are wanted, camphor, alcohol, antimony, and other ingredients, are required, according as the stars are to be blue, white, &c. In some cases, gold and silver rain is required; then brass dust, steel-dust, saw-dust, &c., enter into the composition. Hence the varieties may be almost indefinite. With respect to colour, sulphur gives a blue, camphor a white or pale colour, saltpetre a clear white yellow, sal-ammoniac a green, antimony a reddish, rosin a copper colour, and sulphate of strontia that beautiful purple light so often exhibited in theatres. (See *Rocket*.)

PYROXENE, OR AUGITE. See *Augite*.

PYROXYLIC SPIRIT. When wood is distilled, the products are water, acetic acid, pyroxylic acid, empyreumetic oil, and a black matter, which is considered as analogous to pitch, or, rather, tar. When the watery portion, freed as well as possible mechanically from the tar, is distilled at a low heat, the first portion that comes over is the pyroxylic acid, which may be freed from acetic acid by agitation with lime or magnesia, and subsequent distillation at a low temperature; but it is still impure from the presence of empyreumatic oil. To free it completely from this impurity, it must be mixed with its own weight of sulphuric acid, and the mixture be subjected to distillation. Thus purified, it is a transparent and colourless liquid, having a strong and pungent smell, which has been compared to that of ants, and also to the odour of acetic ether. Its taste is strong, hot, pungent, and very disagreeable. Specific gravity, in its most concentrated state, 0.8121. Its boiling point is 150°. When completely freed from acetic acid, it does not redden vegetable blues. It burns with a very pale yellow flame, inclining to blue, but the light is considerably greater than that given out by alcohol. It burns all away, without leaving any residue, and the only products are carbonic acid and water. It dissolves in alcohol in any proportion. With water it becomes opaque, owing, probably, to a small quantity of oil it still contains. It dissolves readily in oil of turpentine, and in liquid potash, acquiring, at the same time, a yellowish colour. When the solution of this spirit in potash is distilled, we are able to obtain it perfectly pure from every portion of oil. When this spirit is mixed with nitric acid and distilled, an ethereal liquid comes over, possessed of an exceedingly pungent smell, and acting strongly on the nose and eyes. It burns with a bluish flame. The specific gravity of this vapour is 1.94. Pyroxylic spirit is now very commonly used instead of alcohol in the spirit lamp for chemical purposes.

PYRRHA. See *Deucalion*.

PYRRHICHIUS. See *Rhythm*.

PYRRHO, a Grecian philosopher of Elis, founder of the Pyrrhonian or ancient sceptical school, flourished about 340 B. C., and was probably born about the 101st Olympiad. In his youth he studied the art of painting, but was early led to apply himself to philosophy by the writings of Democritus. He accompanied his master, Anaxarchus, to India, in the train of Alexander the Great. During this journey, he became acquainted with the doctrines of the Brahmins, Gymnosophists, Magi, and other Eastern philosophers. His doubts concerning positive knowledge (or his scepticism) were strengthened as he proceeded in his studies, until at length he came to hold all knowledge useless, and considered virtue alone as valuable. In all disputes, his answer to his opponents was, "What you say may, or may not, be true; I cannot decide;" and he taught in his school, that truth could not be attained, but we must be content to suspend our judgment on all subjects. He spent a great part of his life in solitude, and, by abstaining from all decided opinions (ἐποχὴ) concerning moral and physical phenomena, he endeavoured to attain a state of tranquillity not to be affected by fear, joy or sorrow. He bore corporal pains with great fortitude, and no danger could disturb his equanimity. In disputation, he was distinguished for acuteness of argument and clearness of language. His countrymen made him high priest, and exempted all philosophers from the payment of taxes. Pyrrho died in the ninetieth year of his age. The Athenians erected a statute in honour of him, and his countrymen raised a monument to his memory. His scepticism is easily accounted for. He early became acquainted with the system of Democritus, who held that, except the immediate elements of bodies (atoms), nothing was real, and that all perception was subjective. (See *Objective*.) He was confirmed in these views by the doctrines of Socrates, to whom, in his character, he bore a great resemblance. Cicero mentions him expressly among the disciples of Socrates, and his scepticism is allied to the irony of that philosopher. Led, by his temperament and and his manner of life, to esteem an uninterrupted tranquillity the great object of all philosophy, believing that nothing tended so much to destroy this quiet as the interminable disputes of the schools of the Dogmatists, and that uncertainty was increased by their contentions, he determined to seek, in some other way, the peace which he despaired of finding in dogmatical philosophy. This made him a sceptic. Pyrrho left no writings. His friend and scholar, Timon, first wrote on the subject of scepticism, but his writings are lost. It is only from the works of his later followers, particularly Sextus Empiricus, that we learn the principles of his school, or rather their mode of thinking, by which they strove rather to overthrow other philosophical structures, than to build up one of their own.—A disposition to doubt is often called, from this philosopher, *pyrrhonism*.

PYRRHUS; son of Achilles and Iphigenia, whom his father, afterthe sacrifice of Iphigenia, carried to Scyros, and gave to Deidamia. Others say that Deidamia, daughter of Lycomedes, was his mother. He was educated at Scyros, and remained there till after his father's death, when Ulysses and Diomedes took him away, because Calchas had declared, that without him Troy could not be taken. He now received the name of *Neoptolemus*, on account of his engaging in war so young. Homer describes him as beautiful, eloquent and fearless. The post-Homeric poets ascribe to him the sacrifice of Polyxena on the tomb of his father, the carrying off of Philoctetes from Lemnos, and the death of Polites and Priam. Andromache and Helenus fell to his share among the captives. Later accounts differ very much. Some say that he returned by land; others, by water. According to some, he went to Epirus, among the Molossi, and there founded a new kingdom. Here Andromache became his wife, by whom he had Molossus, Pierus, and Pergamus, and, at length, left his wife and his kingdom to Helenus, whom he honoured as a soothsayer. He then appears in a new mythological series of events, the basis of which is to be found in Homer. He is represented to have married Hermione, whom her father, Menelaus, had betrothed to him before Troy. On this account he was, according to some, murdered by Orestes, the former husband of Hermione, at the altar of Apollo. According to others, his death was occasioned by Apollo, whom he had offended. It is generally agreed, that his death took place at Delphi. Here his grave was shown, and a yearly sacrifice was offered in honour of him.

PYRRHUS II., king of Epirus, B. C. 300, was one of the greatest generals of his age, ambitious of fame and conquest. He ascended the throne of his father when but twelve years old; being driven from it, five years afterwards, by Neoptolemus, he soon regained it, and increased his power by the conquest of Macedonia. Being called by the Tarentines (see *Tarentum*) to aid them against the Romans, he twice defeated the latter by means of his elephants, to which the Romans were unaccustomed; but his confession, "Such another victory, and I must go home alone," proved the cost of his triumph. In the mean time, the disturbances in Syracuse tempted him into Sicily. But he returned to Italy, without having accomplished his vain scheme of conquest; and being here defeated by the Romans, who had now become acquainted with his mode of fighting, he was obliged to return to Greece, without having succeeded in his designs. A tile, at the siege of Argos, ended his restless life (272 B. C.). From this king the Romans learned most of their art of war, which afterwards made them so formidable to their enemies. (See *Fabricius*.)

PYTHAGORAS; a Grecian philosopher, founder of the Italian school. According to the most received opinion, he was a native of Samos. His father, Mnesarchus, was a merchant (probably of Tyre or some other Phœnician city), who traded to Samos, where he received the rights of citizenship, and settled with his family. The year of Pythagoras's birth is uncertain; probably it took place about 584 or 586 B. C. His history is mingled with many fables. He received his first instruction from Creophilus in his native city. He then went to the island of Scyros, and was a scholar of Pherecydes till the death of the latter; others make him also a scholar of Thales. Jamblichus says, that Pythagoras, during his journey to Egypt, spent some time in Phœnicia in intercourse with the successors of Moschus, and other priests of the country, by whom he was initiated into their mysteries, and that he travelled through various parts of Syria, in order to become acquainted with the most important religious usages and doctrines. But this account is blended with many fabulous circumstances. Pythagoras is said to have been recommended by Polycrates, king of Samos, to the Egyptian king Amasis. In Egypt he was probably initiated into the mysteries of the priests, and became acquainted with the whole range of Egyptian learning. From Egypt he is said to have journeyed to the East, and visited the Persian and Chaldean Magi, as well as the Indian Gymnosophists. After his return he opened a school at Samos, in which he taught his doctrines in a symbolic form, in imitation of the Egyptians. Tradition, morever, relates that he went to Delos, and received from the priestess moral maxims, which he communicated to his disciples under the name of *divine precepts*. He also visited Crete, where the priests of Cybele took him to the caverns of Ida, in which Jupiter had been cradled, and where his grave was pretended to be shown. Here he met Epimenides, who boasted of having intercourse with gods and the gift of prophecy, and whom he initiated into the sacred mysteries of the Greeks. From Crete he is said to have gone to Sparta and Elis, and from thence to Phlius, where, being asked by king Leon what was his profession, he replied that he was a philosopher (or friend of wisdom), declaring that the name of sage (*sophos*) belonged solely to the Divinity. With augmented knowledge he returned home, where he now founded a philosophical school with great success. His doctrines seemed divine oracles; and the sacred obscurity in which he had the art of veiling them, attracted a great number of disciples. He resolved, nevertheless, to leave Samos, either to avoid the public offices conferred upon him, or the tyranny of Polycrates, and went to Magna Græcia. He landed at Crotona, whose inhabitants were notorious for the looseness of their manners. From all traditions it may be concluded, that he laid claim to supernatural powers, and his extraordinary qualities collected around him persons of all classes. The good effects of his influence were soon visible. Sobriety and temperance succeeded to the prevailing luxury and licentiousness. Six hundred of the inhabitants of Crotona are said to have submitted to the strictest precepts of his doctrine, and united their property in one common stock, for the benefit of the whole community or society which Pythagoras founded. The object of the society was to aid each other in promoting intellectual cultivation. From all quarters Pythagoras found numerous pupils, who paid him almost divine honours. But as he taught the nobles, who joined him, his society became suspected by the popular party. At the head of his enemies in Crotona was Cylon, a rich and respectable citizen, whose enmity he had excited by refusing to receive him among his scholars. In revenge, Cylon once attacked the house of Milo, where a number of Pythagoreans were assembled, surrounded it with his partisans, and set it on fire. Forty persons perished, and but few escaped. Pythagoras was probably not in the house. He fled to the Locrians, and, when these refused to receive him, to Metapontum. Finding enemies here also, who meditated his ruin, he sought an asylum in the temple of the Muses, where, according to tradition, he perished from want of sustenance, eighty years of age (about 506 B. C.). His scholars are said to have paid him divine honours after his death. He is said to have asserted, that his soul had already lived in several bodies. In public he appeared in the Oriental costume, in a long white robe, with a flowing beard, and, as some say, with a crown of gold on his head. His exterior was grave, commanding, and dignified. He abstained, it is related, from all animal food, and limited himself to vegetables, not, however, eating beans. These circumstances contributed to give him the appearance of an extraordinary being. To show his respect for marriage, he took a wife at Crotona, by whom, among several children, he had two sons, Telanges and Mnesarchus, who were his scholars and successors. That Pythagoras left any works, is improbable on the testimony of the ancients. The Golden Sentences, extant under his name, which may be considered as a short abridgment of his popular doctrines, appear to have been composed by later hands. Like those of the Egyptian priests, his doctrines were of two kinds, public and secret. His public instruction consisted of practical discourses, in which he recommended virtue and dissuaded from vice, with a particular reference to the various relations of mankind, such as those of husbands, and wives, parents and children, citizens and magistrates, &c. His hearers at these lectures must not be confounded with the members of his society, whom he subjected to a separate discipline, and not till after long instruction and severe examination admitted to all the mysteries of his secret doctrines. These scholars were required to practise the greatest purity and simplicity of manners. He imposed upon them a silence of two to five years, according to circumstances (the Pythagorean silence). For a time, the disciples were only hearers. The well-known "He said so (*αὐτος ἐφα*)" was sufficient authority, without any proof. He alone, who had passed through the appointed series of severe trials, was allowed to hear the word of the master in his immediate presence. Whoever was terrified by the difficulties, might withdraw, without opposition, and his contributions to the common stock were repaid, a tomb was erected to him as if he were dead, and he was no more thought of. To the members of the secret society, the doctrines were not delivered, as to others, under the mask of images and symbols, but unveiled. These secrets probably related to religious and political subjects. It was requisite, however, to take an oath of secresy. The pupils could now interrogate and make objections. They were called, by way of distinction, *Pythagoreans*. As soon as his disciples had made sufficient progress in geometry, they were introduced to the study of nature, to the investigation of fundamental principles, and to the knowledge of God. Others, according to their inclinations and capacities, were instructed in morals, economics, or politics, and afterwards employed either in managing the affairs of the society, or sent abroad to inculcate and bring into practice the principles of philosophy and government in the other Grecian cities. According to the accounts of later writers, the mode of living at the Pythagorean school at Crotona, was the following: The Pythagoreans, with their wives and children, lived together in a public building, in perfect harmony, as if one family. Each morning it was decided how the day should be spent, and every evening a review was made of all that had been done. They rose before the sun, in order to worship it; verses from Homer and other poets were then recited, or music was introduced, to arouse the mental powers, and fit them for the duties of the day. Several hours were then spent in serious study. A pause followed for recreation, in which a solitary walk was usually taken, to indulge in contemplation; a conversation then took place. Before dinner, various gymnastic exercises were performed. The common meal consisted principally of bread, honey, and water. The remainder of the day was devoted to public and domestic affairs, conversation, bathing, and religious performances. After the destruction of the association, and the flight of his scholars from Lower Italy, Lysis and Archippus deemed it necessary to collect the doctrines of their master in a systematic treatise, and preserve them from oblivion; but the greatest secrecy was nevertheless, recommended. Thus Plato purchased from Philolaus a writing on the philosophy of Pythagoras, and received from Archytas his commentaries on the verses and tenets of his master.

The accounts that we possess of the doctrines of Pythagoras are very scanty, and, with the exception of what we learn from Aristotle, and from some fragments of the Pythagoreans, very uncertain. Neither can we accurately discriminate between his doctrines and those of his scholars. Later writers represent him as making it the object of all philosophy to exalt the mind to the contemplation of immutable truth, to the knowledge of divine and spiritual objects. This can only be effected by degrees, on account of familiarity with sensual things. The first step to wisdom is the study of mathematics, the foundation of which appeared to him to be the doctrine of numbers. Numbers are, in his view, the first and most essential of things. They are, as it were, the model, according to which the world is formed in all parts. The odd numbers are limited and perfect; the even unlimited and imperfect. The *monad*, or unity, is the source of all numbers. The *dyad* is, according to the later Pythagorean doctrines, imperfect and passive, and the cause of increase and division. The *triad*, compounded of the *monad* and *dyad*, partakes of the nature of both. The *tetras*, or number four, is in the highest degree perfect. The *decad*, which contains the sum of the four prime numbers, and is therefore called *tetractys*, comprehends all musical and arithmetical proportions, and denotes the system of the world. The real meaning of the Pythagorean doctrine of numbers is not well understood; numbers were probably, in this system, the symbolical or allegorical representations of the first principles or forms of nature. As Pythagoras could not express abstract ideas in simple language, he seems to have made use of numbers, as geometers do of a diagram, to assist the comprehension of his scholars. He perceived some analogies between numbers and the attributes of the divine understanding, and made the former the symbols of the latter. As the numbers proceed from the *monad*, or unity, undergo various combinations, and in their progress assume new properties, so he regarded the pure and simple essence of the Deity as the common source of all the forms of nature, which, according to their various modifications, possess different properties. Pythagoras is also said to have invented the multiplication table (*abacus*), thence called the *Pythagorean table*. Next to numbers, music belongs to the preparatory exercises of the Pythagorean school, by which the mind was elevated above the dominion of passion, and fitted for contemplation. Pythagoras considered music not only as an art to be judged of by the ear, but as a science to be reduced to mathematical maxims and relations, and allied to astronomy. Tradition makes him the inventor of a musical (Pythagorean lyre, *octochordum Pythagoræ*), which, after his death, was engraved in brass, and preserved in the temple of Juno at Samos. The invention of the harmonic canon, or monochord—an instrument of a single string—which served for the measurement of musical intervals, has also been ascribed to him by ancient and modern writers. He believed that the heavenly spheres, in which the planets move, dividing the ether in their course, produced tones, and that the tones must be different according to their size, velocity, and distance. That these relations were in concord, that these tones produced the most perfect harmony (music of the spheres), he necessarily believed, in consequence of his notions of the supreme perfection of the universe. The real meaning of this doctrine was, that he regarded the world as a harmonically arranged whole (κόσμος), in which the relations of numbers were realized. His followers took occasion from this doctrine to say of their master, that he was the only mortal whom the gods had permitted to hear the harmony of the spheres. Geometry, which he had learned in Egypt, he reduced, more than any of his predecessors and contemporaries, to the form of a regular science. According to his notion, the geometrical point was simple, the line double, the area threefold, and solids quadruple; and in this way, also, he applied the doctrine of numbers. Of the geometrical theorems which are ascribed to him, the following are the most important: The three angles of a triangle are together equal to two right angles; and in a right-angled triangle, the square of the hypothenuse is equal to the sum of the squares of the two sides. This last is still called the *Pythagorean theorem* (also *magister matheseos*), although it is doubtful whether Pythagoras invented it. In astronomy he taught the following: The word *heaven* denotes either the spheres of the fixed stars, or the whole space between the fixed stars and the moon, or the whole world, including both the heavenly spheres and the earth. Agreeably to the arithmetical hypothesis, there are ten heavenly spheres, of which nine are visible to us, viz. the sphere of the fixed stars, the seven spheres of the seven planets (including the sun and moon), and the sphere of the earth. The tenth earth, called by him *Antichthon* (anti-earth), is invisible, but necessary to the perfection of the harmony of nature, since the *decad* is the perfection of the numerical harmony. By this anti-earth he explains the eclipses of the moon. In the middle of the universe is the central fire, principle of warmth and life. The earth is one of the planets, moving around the sphere of fire. The atmosphere of the earth is a gross, immovable mass, but the ether is pure, clear, always in motion, and the region of all divine and immortal natures. The distances of the various heavenly spheres from the earth correspond to the proportions of the musical scale. His moon and stars are gods, or inhabited by gods. Pythagoras, therefore, rendered important services to the mathematical sciences, and first established a mathematical philosophy. His disciples Philolaus, Archytas, Ecphantus, Ocellus, Timæus, carried it farther. Philolaus, in particular, whose fragments are the most valuable relics of the Pythagorean school, distinguished himself by his astronomical system. With mathematics were also connected the natural sciences. With respect to philosophy, Pythagoras taught, that true knowledge embraced those subjects which are in their nature immutable, eternal, and indestructible, and of which alone it can be properly predicated, that they exist. He who devotes himself to this study is a philosopher. The object of philosophy is, by contemplation, to render the human mind similar to the divine, and make it fit to enter the assembly of the gods. For this purpose it is necessary to invoke, in prayer, the assistance of the Divinity and good demons. Contemplative wisdom cannot be fully attained without entire abstraction from common things, without entire tranquillity, and freedom of mind. Hence the necessity of founding a society separate from the world, for contemplation and study. The theoretical philosophy of Pythagoras, which treats of nature and its origin, was enveloped in the most profound obscurity, and we know nothing of it, but what may be conjectured from single intimations of the ancients. In the opinion of Pythagoras, God is the universal spirit, diffused in all directions from the centre, the source of all animal life, the actual and inward cause of all motion, in substance similar to light, the first principle of the universe, incapable of suffering, invisible, indestructible, and to be comprehended by the mind alone. To the Divinity there were subordinate, according to the notions of the Pythagoreans, three kinds of intelligences, gods, demons, and heroes, emanations of the supreme God, varying in dignity and perfection, in proportion as they were more or less removed from their source. The heroes he believed to be clothed with a body of subtile matter. Besides these three kinds, there was a fourth—the human mind; likewise an emanation of the Divinity. As God is one, and the origin of all variety, he was represented as a monad, and the subordinate spirits as numbers derived from and contained in unity. Thus the numbers of Pythagoras resembled the ideas of Plato, excepting that they are contained in the things themselves. The regions of the air the Pythagoreans thought filled with spirits, demons, and heroes, who were the cause of health or sickness to men and animals, and, by means of dreams and other kinds of divinations, imparted the knowledge of future events. The soul, according to him, was likewise a number, and by numbers it first has perception, as Philolaus says, of the world; it is an emanation of the central fire, and, consequently, always in motion, and indestructible. Of man, the Pythagoreans believed, at least the later, that, since he consisted of an elementary nature, of a divine or rational principle, he was a microcosm; that his soul was a self-moving principle, and consisted of two parts, the rational, which was a portion of the universal soul, an emanation of the central fire, and had its seat in the brain, and the irrational, which comprised the passions, and lived in the heart; that in both, man had something in common with the brutes, who, on account of their bodily structure and the want of language, are incapable of acting reasonably; that the sensitive soul (θυμός) perishes, but that the rational mind (φρήν, νοῦς) is immortal, because it has its origin in an immortal source; that the latter, when freed from the fetters of the body, assumes an ethereal vehicle, and passes to the habitations of the dead, where it remains till it returns to the world, to dwell in some other human or animal body, and that at last, when sufficiently purified, it returns to the source from which it proceeded. This doctrine of the transmigration of souls (metempsychosis), which was originally Egyptian, and connected with the idea of the reward and punishment of human actions, was the chief cause why the Pythagoreans killed no animals. His morality Pythagoras taught in symbolic maxims and ascetic precepts, in connexion with his contemplative views. The powers of the mind are reason and passion; where the latter is obedient to the former, virtue reigns. The mind possesses unity, harmony, and a resemblance to God. Right consists in retribution. The following maxims are also ascribed to him. "Youth should be habituated to obedience, for it will then find it easy to obey the authority of reason. It should be trained in the best course of life; habit will soon make it the most pleasant." "Silence is better than unmeaning words." "The wise man should be prepared for every thing that does not lie within his control." "Do what you consider right: whatever the people think of you, despise its censure and its praise." "It is cowardly to quit the post assigned us by God, before he permits us." "Strength of mind rests on sobriety, for this keeps the reason unclouded by passion." "No one is to be deemed free, who has not perfect self-command." "Intoxication is a temporary madness." "The desire for the superfluous is folly, for it has no bounds," &c. The Pythagoreans recommended, especially, the virtue of friendship. In it, Pythagoras requires the absence of all dissension, perfect confidence, aid under all circumstances, and a mutual endeavour to make each other perfect. To true friends every thing is common. True friendship is imperishable. In performing the usages of religion, he required piety of soul. The gods are to be worshipped by symbols corresponding to their nature, by simple purifications and offerings, and with purity of heart. An oath should never be violated. The dead must not be burned. Next to the gods and dæmons, the highest respect belongs to parents and lawgivers. The laws and customs of our country are to be sacredly observed. The Pythagorean philosophy had a great influence on the Platonic. In later times, it was revived and intermingled with New Platonism. See *Geshichte der Pythagoräischen Philosophie*, by Ritter (Hamburg, 1826), and Bokh's *Disputat. de Platonico Systemate Cœlest. Glob.*, &c. (Heidelb., 1810, 4to.)

PYTHAGOREAN LYRE.
PYTHAGOREAN TABLE. } See *Pythagoras.*
PYTHAGOREAN THEOREM.

PYTHIA, and PYTHONISSA. See *Delphi.*

PYTHIAN GAMES; one of the four great Grecian games, instituted in early times, in honour of Apollo, the conqueror of the Python. They were celebrated in the Crissean fields near Delphi (formerly called *Pytho*), at first every nine years, but afterwards, by the command of the Amphictyons, every five years. Poems in honour of Apollo were sung to the flute or the lyre, and poets contended for the prize, which was a crown of laurel or oak.

It is said, that in the first Pythian solemnity, the gods contended, that Castor obtained the victory by horse-races, Pollux at boxing, Calais at running, Zetes at fighting in armour, Peleus at throwing the discus, Telamon at wrestling, Hercules in the Pancratium; and that all of them were honoured by Apollo with crowns of laurel. But others again tell us, that at first there was nothing but a musical contention, in which he who sung best the praises of Apollo obtained the prize, which at first was either silver or gold, or something of value, but was afterwards changed into a garland.

In the third year of the 48th Olympiad flutes were introduced which till that time had not been used at this solemnity; the first that won the prize was Sacadas of Argos: but because they were more proper for funeral songs and lamentations than the merry and jocund airs at festivals, they were in a short time laid aside. The Amphictyons were the judges in the contests. Other musical and gymnastic contests were afterwards added. In later times, these games were celebrated in other Grecian cities, and were kept up at Delphi as late as the third century A. D. The Romans, are said to have introduced them into their city, and called them Apollinares Ludi.

PYTHIAS. See *Damon*.

PYTHON; a dreadful dragon, which sprang from the mud left by the flood of Deucalion, and dwelt near Crissa, on Parnassus, watching the future oracle of Delphi. Acquainted with the future, he foresaw that the son of Latona would kill him, and he persecuted her with the greatest violence. Apollo slew him with an arrow, the first day after his birth, threw his bones into a deep chasm, possessed himself of the oracle, and received from this circumstance the surname of *Pythian*, "the slayer of the Python." This fable was probably meant to indicate the power of the sun over the noxious vapours, remaining after a great flood.

Q.

Q; the seventeenth letter in the English alphabet, and one of the mutes. The ancient Latins had not this letter, but wrote *oblicus*, *locuntur*, not *obliquus*, *loquuntur*; and after it was introduced among the Romans, it was considered by some, not as a letter, but a character expressing two letters; hence some wrote *qis*, *qeret*, *qid*, while others preferred *cuis*, *cueret*, *cuid*. The Greeks had not the letter. The Latin *q* is probably borrowed from the Phœnician and Hebrew ק (*koph*). It has been considered by many grammarians, who have treated of different languages, as a superfluous character; and in French and Spanish, which have no *k*, it has been retained in the alphabet only to express this sound. The Spaniards now write *cuanto*, not *quanto* but have retained the *q* in *que* and *qui*, pronounced *ke* and *ki*; *qüe* and *qüi* are now written *cue* and *cui*. In the articles on the letters *G*, *H* and *K*, we have touched upon the near affinity of the aspirate and guttural sounds. The sound of *qu* is that of the guttural *k*, with the breathing sound of *v*, or the German *w*; and as the aspirate *h* (see *H*) is often put before words merely as an addition, so also is this stronger (guttural) sound *q*. For instance, we find in Ulphilas *quivan* (to live), the Latin *vivere*; the German *Qualm* (smoke) is in Dutch *walm*. It is not improbable, that in various words the sound *qu* has been changed into the sounds *w* or *v*; thus Adelung says, that the Latin *qualis* and the German *welcher*; *quis*, *quem*, *quod* and the German *wer*, *wem*, *was* (formerly in Low Saxon *hwat*); *quando* and the German *wenn* (formerly *hwanne*), are intimately related. That the sound became changed in Latin itself, is evident by the derivation of *inquilinus* from *colere*, *coctio* and *coculum* from *coquere*. The following instance shows how the kindred sounds alternate in different languages. The *Quuerca* of Rabanus (q. v.), the Swedish *qvarka*, the Finnish *curcku*, the Icelandic *kuerkur*, is the German *Gurgel* (throat). Q, as a Roman numeral, signified 500, according to the verse—

Q velut A cum D quingentos vult numerare;

with a dash over it, 500,000. Q, as an abbreviation, stands for *quæstor*, *quartus*, *quinquennalis*, *que* (as in the famous *S. P. Q. R.*, *senatus populusque Romanus*), *quod*, &c.; *Q. TP.*, for *quo tempore*; *QVIR.*, for *quirinalia*; *Q. R.*, *quæstor reipublicæ*; and *D. N. M. Q. E.* signified *devotus numini majestatique ejus*.

QUADI; a Teutonic tribe whose ancient territory was on the Danube, extending to the Theiss on the east, and to the Carpathian mountains on the north. They waged destructive wars with the Romans, particularly under Marcus Aurelius (died A. D. 180). They cease to be heard of in the fifth century.

QUADRA AND VANCOUVER'S ISLE: a large island on the north-west coast of North America, between lat. 48° 21′ and 50° 54′ N., and lon. 122° 49′ and 128° 21′ W. It is separated from the continent by Johnstone's straits and Queen Charlotte's sound towards the north, and by the straits of Juan de Fuca towards the south. The island has been little visited, but it is known to be mountainous and well-wooded. It is about 300 miles in length by eighty in breadth. The natives are numerous, and live principally by fishing. Nootka sound (q. v.), on its western coast, is the principal bay; it was discovered by captain Cook in 1778. In 1786, a factory was established here by English merchants, but the Spaniards took possession of it in 1789. It was afterwards restored to England, and received its present name from the meeting of Quadra, the Spanish officer, and Vancouver, the English agent, on occasion of completing the cession.

QUADRAGESIMA, OR QUARESIMA. See *Lent*.

QUADRANS; a division of the Roman *as;* also anciently, in England, a farthing. Before the reign of Edward I., the smallest coin was a sterling, or penny, marked with a cross; by means of which a penny might be cut into halves and quarters; till, to avoid the fraud of unequal cuttings, that king coined half-pence and farthings in distinct round pieces.

QUADRANT (*quadrans*, a quarter of a circle); an astronomical instrument, which serves to measure an arc of a great circle of the heavens, in order to determine the altitude of a heavenly body. Its name indicates that it consists of an arc of ninety degrees; the degrees are subdivided into smaller divisions. The quadrant is provided with glasses attached to a straight rod, through which the heavenly body is to be seen, and the position of which on the graduated arc, determines the altitude of the body. In modern times, this instrument has been improved by the superior accuracy of the graduation, and by the use of a telescope, instead of simple dioptric glasses, for sights. Instead of the quadrant, it is now more common to use an entire circle. Quadrants are movable or fixed. The former are for common use, set in a vertical plane, and are of two sorts; in the one, the glasses are attached to a side of the quadrant, and a plumb line, suspended from the vertex, plays along the graduated arc; in the other, the quadrant itself remains stationary, and the rod to which the glasses are attached, moves upon the arc. The fixed quadrants are larger, and are set in a wall of an observatory in the plane of the meridian. The observations made by them are more accurate. See *Godfrey, Thomas*.

Quadrant, Gunter's. See *Gunter's Quadrant.*

QUADRAT, in printing; a piece of metal cast like the letters, to fill up the void spaces between words, &c. There are quadrats of various sizes, called *m* quadrats, *n* quadrats, &c.

QUADRATIC EQUATIONS. See *Equations*.

QUADRATRIX, in the higher geometry; a transcendental curve, which Denostrates, and in modern times, Tschirnhausen, made use of to find the quadrature of the circle by approximation.

QUADRATURE, in astronomy; that aspect of the moon when she is ninety degrees distant from the sun; or when she is in the middle point of her orbit, between the points of conjunction and opposition, namely in the first and third quarters.

QUADRIVIUM. See *Schools*.

QUADRUPEDS, in zoology; a class of land animals, with hairy bodies, and four limbs or legs proceeding from the trunk of their bodies; the females are viviparous, or bring forth their young alive, and nourish them with milk from their teats. They constitute with man, (*bimana*,) the monkeys, (*quadrumana*,) and the cetaceous animal, the division *mammalia*. See *Animals*.

QUADRUPLE AND QUINTUPLE ALLIANCE. The natural but undue influence, which European states have mutually exercised upon each other, has at times produced alliances more complicated than any which history elsewhere records, and which could be produced only by a combination of various interests. Alliances of this nature indicate the existence of powerful interests and counter interests, to trace which to their origin is one of the chief purposes of history. The first quadruple alliance, so called from the number of the contracting parties was the alliance which was concluded October 28, 1666, between the states-general, (Holland,) Denmark, the Duke of Brunswick-Luneburg, and the elector of Brandenburg. The second was concluded at London, August 2, 1718, between Great Britain, France, and Austria, and was called quadruple because acceded to by Holland, February 16, 1719. The object of this league was to force Spain to consent to the peace of Utrecht. It continued to be so called even after the Duke of Savoy and Spain had joined the alliance. The quadruple alliance of Austria, Russia, Great Britain, and Prussia, at Chaumont, March 1, 1814, originated from their coalition, which had effected the dissolution of the French empire. (See *Coalition*, and *Chaumont*.) It was less an alliance in the diplomatic sense of the word, than an armed union for the restoration of the independence of its members. After effecting its object, it became the basis of the European political system which prevailed with little effectual opposition until 1830, having been confirmed by the congress of Vienna, the Holy Alliance, (q. v.) and the congress of Aix-la-Chapelle, in October and November, 1818, when the Alliance became, in a certain respect, quintuple, as France joined the union professedly for the maintenance of peace in Europe: England joined the three other powers for the overthrow of Napoleon; but when the alliance became obviously directed against the national independence which had been originally its professed object, and religious sophistry was blended with political, to deceive the people, and the right of armed interference was boldly pronounced, and in several instances carried into effect, England naturally separated more and more from the other powers in consequence of its constitutional system, until at length Canning proclaimed the principle of non-intervention. (See *Intervention*.) History will yet speak of quadruple and quintuple alliances in the great struggle between the friends of liberty and the friends of despotism.' See *Alliance*.

QUÆSTOR. See *Questor*.

QUAGGA, (*equus quagga*.) This animal which is an inhabitant of the southern parts of Africa, is not unlike the zebra; its ears however are shorter, and it is not marked with stripes on its fore legs or hinder parts; its rump is of a greyish colour, and its belly, legs, and tail whitish. The quagga is a social animal, living in large troops, is far more tractable than the zebra, and is said to be occasionally used at the Cape of Good Hope for domestic purposes. Notwithstanding this mildness of character when domesticated, it is exceedingly fearless in its native plains, and is even said to be more than a match for the hyæna, fighting desperately both with its hoofs and teeth. It will breed with the common horse; a mixed race of this kind, possessing great beauty of form, and retaining in a great degree, the characteristic markings of the quagga, existed in England some years since. The quagga has received a variety of names from authors, thus Pennant terms it the *quacha*, Masson the *opeagha*, and Sparrman calls it by the name here adopted. It should be remarked that Edwards has mistaken it for the female zebra.

QUAIL (*coturnix*, Cuv.) The quails are very closely allied to the partridge, differing only in being smaller, and having a more delicate beak, shorter tail, and no spur on the legs. The quail is found in every country from the Cape of Good Hope to the North Cape. These birds are deemed excellent food by the moderns, but the ancients entertained a prejudice against their flesh, from an idea that they fed upon hellebore, and were subject to epileptic attacks: *Semen veneni gratissimus cibus, quam ob causam, eam damnavere mensæ*, Plin. lib. x. cap. 23. Quails are birds of passage, appearing in Europe about May, and departing in September; they appear to winter in Africa. In some parts, however, they remain the whole year. (See the work of Buffon.) Besides the celebrity of these birds as articles of food, they have been much prized for their pugnacious propensities. Quail fighting appears to have been as common at Athens, as cock-fighting in more modern times. This diversion was also in high estimation in Rome, and is still pursued in some parts of Italy. In the East, and especially in China, they are also pitted against each other, after having been armed with artificial spurs. The European quail is about seven inches long; the feathers of the head are black, edged with a rusty brown. The hinder part of the neck and crown of the head are divided by a long pale-yellow line; the breast is of a yellowish-red, spotted with black; the scapulars and feathers of the back are marked with a pale yellow line in their middle, and with ferruginous and blackish bars on their sides. The notes of the cock and hen quail are very dissimilar; and it is remarkable that the proportion of males much exceeds that of females. Their flesh is more juicy and delicate than that of the partridge. American quail, or partridge, as it is termed in Pennsylvania, belongs to the subgenus *ortyx*, distinguished from the former by having a larger, shorter, and more arched bill, and peculiar to America. The American quail is found from New England to Honduras. Notwithstanding there is some resemblance in form and general appearance, between the quails of the two continents, they differ very widely in their habits; thus instead of being a bird of passage, scarcely any of the feathered tribe appear to have so strong local attachments as the American quail. This is well known to sportsmen, who are in the habit of turning out pairs of these birds when an unusually severe winter has destroyed the coveys in their neighbourhood. The quail constructs her nest in May; this is made on the ground, and generally at the foot of a thick tuft of grass, that shelters and conceals it. The materials employed in its construction are leaves and dry grass. The female lays about fifteen or twenty eggs, which are perfectly white. Wilson is of opinion that the common idea, that quails occasionally lay in each other's nests, is correct. About the beginning of September, the young birds nearly attain their full growth, and associate in flocks or coveys of various sizes, and at this time also their untiring persecution by sportsmen and trappers begins. During the end of the summer, and beginning of the autumn, the note of the male is everywhere heard; this is very similar to the words "Bob White," accompanied with a whistling sound. About the first of October, they prepare for winter, and to enter on what is termed their *running* season, when they are to be met with in swamps and thickets, instead of the open fields. The food of the quail is composed of grain, seeds, insects, &c., but their favourite articles are buckwheat and Indian corn. Like the rest of the gallinaceous tribe, the quails fly with a loud whirring sound, occasioned by the shortness of their wings and the rapidity with which they move them. During the winter they often suffer greatly from the inclemency of the weather, and whole coveys are found frozen in spots where they had endeavoured to shelter themselves. The American quail is about nine inches long, and fourteen in extent, usually weighing from seven to eight ounces. The bill is black; line over the eye, down the neck and whole chin pure white, bordered by a band of black, which descends and forms a crescent on the throat; the eye is dark hazel; crown, neck, and upper part of the breast, red brown; sides of the neck spotted with white and black on a reddish brown ground; back, scapulars, and lesser coverts, red brown, mixed with ash, and minutely marked with black; wings plain and dusky; lower part of the breast and belly whitish, marked with black arrow heads; tail ash, spotted with reddish brown. See Wilson, *Ornithol.*, vol. vi. and Nuttall, *Ornithol.*, 647.

QUAKERS, or FRIENDS, [the following article was written by a member of the society of Friends, and therefore expresses their opinions;] a society of Christians which took its rise in England about the middle of the seventeenth century. George Fox, a native of Drayton, in Leicestershire, was the first minister whose preaching was instrumental in convincing the people of those religious views which distinguish the society, and his disinterested labours were so successful, that, in a few years, a numerous society was gathered in England and subsequently in America, where the great body of them is now found. He was born in the year 1624, and commenced his ministerial labours in 1647, being then in the twenty-third year of his age. He travelled much on foot, and from conscientious motives, not only refused to receive any compensation for preaching, but defrayed his own expenses. The seventeenth century was distinguished by the extraordinary interest which pervaded England on the subject of religion. Many persons were awakened to an earnest inquiry, "What shall we do to be saved?" and not finding, in the most precise observance of the ceremonies of religion, the true peace, and that victory over sin which they longed for, they were induced to seek, by prayer and meditation, a nearer and more intimate communion with the God of their lives. They diligently searched the Holy Scriptures, and found in those sacred records a clear testimony borne to the important truth, that, "the grace of God, which bringeth salvation, hath appeared unto *all* men." Continuing in an humble, seeking state of mind, they gradually became acquainted with its secret influences on their hearts, inclining them to virtue and holiness, and warning them against the commission of evil. As they submitted to its heart-changing operation, they experienced the bondage of sin and the power of the tempter to be broken, and received ability to live in the fear and favour of God. As George Fox was led to bear a clear and convincing testimony in his ministry to the inshining of this divine light, and to direct the people to its teachings, his doctrine met with a cordial assent in minds thus happily prepared to receive it; and to this cause we may attribute the rapid increase of the society of Friends. Being thus instructed in the things pertaining to salvation, and their understandings enlightened to see the beauty and excellency of the Christian religion as revealed in the Holy Scriptures, and knowing by experience the blessedness of being "born again of the Spirit," they felt the love of God constraining them to declare unto others those things which the Lord had done for their souls. Feelings of this character, as well as the belief that they were called of God to the ministry of the gospel, induced many of them to engage in this solemn undertaking, and, without any prospect or hope of pecuniary reward, to travel extensively in England and foreign countries, to promulgate the glad tidings of life and salvation. Among the eminent ministers of the society, we may notice George Fox, William Penn, Robert Barclay, George Whitehead, Stephen Crisp, Isaac Pennington, John Crook, Thomas Story, &c. The infant society was soon subjected to the rigours of a severe persecution, sometimes without the pretext of law, and at other times, under cover of legal enactments, made either in Roman Catholic times, or since the reformation against non-conformists. The principle subjects which led to the persecution of the early Quakers were, their testimonies against oaths, a hireling ministry, tithes, and other ecclesiastical demands; the use of the singular pronouns when addressing only one person; their refusal to take off the hat as a compliment to men; and the faithful maintenance of their religious meetings. George Fox was one of the first who was imprisoned. In 1649, he was confined in Nottingham gaol, for opposing a minister on a point of doctrine; and, in the following year, being arraigned before two justices in Derbyshire, he exhorted those about him to tremble at the word of God. One of the justices, scoffing at the pious advice of the minister, deridingly gave him and his friends the appellation of *Quakers*, which has since been generally applied to them by the world, though they themselves, as well as their successors, have adopted the name of *Friends*. The violence of persecution only tended to confirm the faith and strengthen the bond of union among the members of the rising society. Its ministers, fearless of suffering, and ardently devoted to the cause of Christ, boldly preached their doctrines both publicly and privately and were not deterred from their gospel labours by the severest punishments. The members, with one accord, united in strengthening each other's faith, encouraging all to continue steadfast to the religion they had espoused, and to endure with patience and even cheerfulness, the loss of their estates, imprisonment, fines, whipping, banishment from home and country, and even death itself, rather than renounce their principles or violate their testimonies. The spirit of intolerance which caused the society so much suffering in England spread its baneful influence to America, and produced its natural results there also; but in neither country could it shake the constancy of the sufferers nor induce them to relinquish their conformity to apprehended duty. The patient submission to the wrongs inflicted on them, the integrity and blamelessness of their lives, their probity, and the peaceable principles which they held, not only wrought conviction on the minds of many, and thus added to their numbers, but also had a favourable influence on those in authority, who saw that severity served rather to increase and establish the society than to arrest its progress. From these causes, as well as the diffusion of more liberal and enlightened views on the subject of religious liberty, acts were successively passed by the British parliament, relieving Friends from the oppressions under which they suffered, and tolerating their mode of worship, marriage, &c., as well as several of their testimonies. The same liberal policy has been continued by the American government, so that at present they suffer no other molestation in that country, than the occasional distraint of their property to satisfy demands made in lieu of military services, which they cannot conscientiously pay. In this country they are subject to distraints for tithes and other ecclesiastical demands, which, with a few for military services, amount to about £13,500 annually. The first Friends that went to America were two female ministers, who arrived at Boston about the year 1656. Others occasionally visited that country at subsequent periods, and a number of persons having embraced the principles of the society, George Fox went over in 1671 and settled meetings of discipline, for the care of the poor and the preservation of good order in the church. At this period, there were meetings of Friends in most of the colonies along the sea-board from Massachusetts as far south as the Carolinas. In 1682, William Penn arrived in the river Delaware with a large number of his brethren, and founded the city of Philadelphia, and settled themselves there or in the adjacent counties; and in each successive year their numbers were increased by new emigrants from the mother country, and they formed a large and respectable colony. Many of the ancient families in Philadelphia and its vicinity trace their origin to these settlers, and many of the noblest institutions of that city owe their rise to the liberality and benevolence of the society of Friends.

In attempting to give a view of their testimonies and doctrines, the limits, necessarily prescribed in an Encyclopædia, forbid any thing more than a brief sketch. The society believes that, under the gospel dispensation, all wars and fightings are strictly forbidden; the positive injunction of our blessed Saviour Jesus Christ, "Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you and persecute you," entirely precluding the indulgence of those malignant passions, from which alone such contests can arise. They also apprehend that the express command of our Lord and his apostle James, "Swear not at all," prohibits the Christian from the use of judicial as well as other oaths, and that in all things his word should be yea and nay; "for whatsoever is more than this cometh of evil." As Jesus Christ declared to his disciples, that without him they could do nothing, and as he is the Head and Governor of his church, the society believes that a special call and qualification from him, by the influences of his Spirit on the soul, are necessary to constitute a true minister of the gospel; and that as he commanded his disciples "Freely ye have received, freely give," so the faithful minister of Christ cannot make merchandise of the gift received, nor decline the exercise of it because he may not be compensated by a pecuniary reward. It being generally admitted that the baptism of water and a participation in the outward supper are but the signs of that essential baptism of the Holy Ghost, which our Lord Jesus Christ instituted, and of the communion of saints to which he alludes, when he declared to the apostle John in the Revelation, "Behold, I stand at the door and knock; if any man hear my voice and open the door, I will come in and sup with him, and he with me;" and as this spiritual baptism and communion are not dependent on the outward rites, —the society does not consider these as necessary, but presses on its members a submission to the effectual operation of the Holy Spirit, by which the obedient soul is brought to the living experience of the substance, of which these ceremonies are but the external symbols. As simplicity and gravity in dress and demeanour are consonant with the Christian character, the society recommends its members to observe plainness in their apparel and the furniture of their houses, an adherence to the use of the singular pronouns, "thee and thou," when addressing only one person, and the disuse of the customary salutations and tokens of obeisance. Its conduct in these respects arises from the apprehensions that the contrary practices originated in the pride of the human heart, and have a tendency to foster that haughtiness and self-conceit, which it is so much the business of the Christian to mortify and subdue. The doctrines of the society may be stated in a few words; in doing which, it will be proper to observe that its members prefer the use of such terms as are to be found in the Holy Scriptures. They believe in God, the Father; in Jesus Christ, his beloved and only-begotten Son, and in the Holy Ghost, Comforter or Spirit of Truth, one true and living God, blessed for ever. That these are the holy Three that bear record in heaven; to wit, the Father, the Word, and the Holy Ghost, and that these three are one. That in the fulness of time our Lord and Saviour Jesus Christ took flesh, was conceived by the Holy Ghost, and born of the Virgin Mary at Bethlehem in Judea; that he was crucified under Pontius Pilate, voluntarily surrendering himself to the ignominious death of the cross, and suffered for our sins, the just for the unjust, that he might bring us to God; thereby becoming the one, great, universal offering and atonement for all mankind. Hence "he is the propitiation for our sins, and not for ours only, but for the sins of the whole world;" and as each individual submits to the power of the Holy Spirit, renewing and changing the heart, his past transgressions are freely forgiven and blotted out for Christ's sake, and he comes fully to partake of the benefits of that redemption which was purchased for us by the coming, and sufferings, and death, of the adorable Son of God. In expressing themselves concerning this glorious display of the love of God to fallen man, they include a full belief in the deity and manhood of Jesus Christ; in his miraculous birth, holy life, mighty miracles, death, resurrection, and ascension into glory in the heavens, where he is at the right hand of God, as our Redeemer, Mediator, and Advocate with the Father, and whence he shall come to judge the world in righteousness at the great and final day of judgment. As the whole human race is naturally fallen, degenerate, and spiritually dead, of themselves utterly incapable of doing any thing that will tend to their salvation, so the society believes that all have need, and are the objects, of that redemption which is freely offered for their acceptance through Jesus Christ our Lord. That "the grace of God, which bringeth salvation, hath appeared unto *all men;* teaching us, that, denying ungodliness and worldly lusts, we should live soberly, righteously, and godly in this present world;" and that obedience to its dictates is essentially necessary to enable us to persevere in the work of pure and undefiled religion, and finally to receive the end of our faith, even the salvation of our souls. That there shall be a resurrection, both of the just and the unjust, according to the declaration of our blessed Lord, "The hour is coming, in the which all that are in the graves shall hear his voice, and shall come forth; they that have done good, unto the resurrection of life, and they that have done evil, unto the resurrection of damnation," —and that, according to the testimony of the apostle Paul, "It is sown a natural body, and raised a spiritual body." Although Friends do not call the Holy Scriptures the Word of God, but apply this epithet exclusively to the Lord Jesus Christ, yet they believe that these sacred writings are the *words* of God, written by holy men, as they were moved by the Holy Ghost; that they are profitable for doctrine, for reproof, for correction, for instruction in righteousness, that the man of God may be perfect, thoroughly furnished unto all good works; and that they are able to make wise unto salvation through faith which is in Christ Jesus. They also hold them to be the most authentic and perfect declaration of Christian faith, and the only fit outward judge and standard in all religious controversies; and that whatever, either in doctrine or practice, any profess or do, though under pretence of the guidance of the Holy Spirit, if it be contrary to or inconsistent with, the testimony of the Holy Scriptures, is to be esteemed a delusion and error.

The society is governed by its own code of discipline, which is enacted and supported by meetings of four degrees, for discipline, namely, preparative, monthly, quarterly, and yearly meetings. The preparative digest and prepare the business for the monthly meetings, in which the executive power is principally lodged, subject, however, to the revision and control of the quarterly meetings. These are usually composed of several monthly meetings, which are accountable to the quarterly, and over which it exercises its jurisdiction and care. The yearly meeting comprises a number of quarterly meetings, which are subordinate and accountable to it, and subject to its supervision and direction. Its authority is paramount, and it possesses the sole power to make or amend the discipline. There are at present ten yearly meetings, namely, London, Dublin, New England, New York, Philadelphia, Baltimore, Virginia, North Carolina, Ohio, and Indiana, which include a total of about one hundred and fifty thousand members. (For further information, see Sewell's and Gough's *Histories of the Quakers*, G. Fox's *Journal*, Barclay's *Apology*, Tuke's *Principles*, Bates's *Doctrines of Friends*, Evan's *Exposition*, Gurney's *Peculiarities*, &c.)

QUAND MEME; an ultra-royalist phrase in France, taken from a cry common in La Vendée, during the insurrection in that quarter in the revolution: *Vive le roi, quand même*, Long live the king, even though (or at all events). The application of it made by the ultras, however, has been, that they would adhere to the principles of ultra-royalism, though the king himself should recede from them; and the phrase has become quite common, being used in such connections as the *quand même* principle. *Quand même* was, and perhaps still is, the motto of the most violent ultra paper.

QUANTITY AND QUALITY are two forms of thinking, considered to be among the original ideas of the human understanding, or categories. (See *Kant.*) *Qualities* are the interior properties of an object, which are observable in it, without comparison with other objects. By *quantity*, however, we understand that property of an object by which it can be increased and diminished, and estimated according to a given measure. Quantity, in connexion with time, produces the idea of number, inasmuch as we represent to our mind a successive repetition of unities. In logic, the ideas of quality and quantity are of great importance, and are treated with much acuteness by Kant.

QUANTITY, in verse. See *Prosody.*

QUANTZ, JOHN JOACHIM, a flute-player, chiefly known as teacher on the flute to Frederic the Great, was born in Hanover, in 1697. His father was a smith. After holding several appointments, he was invited, in 1741, by the king of Prussia, to Berlin, and remained with this monarch until his death, in 1773. He did much to improve his instrument, and is said to have composed 299 concertos and 200 solos for his royal pupil, of which few came before the public. Frederic was very fond of him, and caused a monument to be erected to him after his death.

QUARANTINE; the period during which a ship, coming from a port suspected of contagion, or having a contagious sickness on board, is forbidden intercourse with the place where she arrives. The term is derived from the Italian *quarantina*, a space of forty days, because originally that was the fixed period for all ships under such circumstances. But the time of a ship's detention is now very various, according to the exigencies of the case.

QUARLES, FRANCIS, an English poet, born in 1592, near Rumford, in Essex, was educated at Cambridge, and entered at Lincoln's Inn. He was under-secretary to archbishop Usher, in Ireland, from which country he was driven, with the loss of his property, by the rebellion of 1641, and was appointed chronologer to the city of London. At the commencement of the civil wars, he wrote a work entitled the Loyal Convert, which gave offence to the parliament; and when he afterwards joined the king at Oxford, his property was sequestrated, and his books and MSS. plundered. He was so much affected by his losses, that grief is supposed to have hastened his death, in 1644. Of the works of Quarles, in prose and verse, the most celebrated is his Emblems, a set of designs in prints, illustrated by verses. A great part of them are borrowed from the Emblems of Hermanus Hugo, but the verses are his own, and, in the midst of much false taste and conceit, contain frequent bursts of fancy and strokes of pathos.

QUARTAN AGUE. See *Fever.*

QUARTER; the fourth part of any thing, the fractional expression for which is ¼. *Quarter* in weights, is generally used for the fourth part of a hundred weight avoirdupois, or twenty-eight lb. Used as the name of a dry measure, *quarter* is the fourth part of a ton in weight, or eight bushels.

QUARTER, in heraldry, is applied to the parts or members of the first division of a coat that is quartered, or divided into four quarters.

QUARTER OF A POINT, in navigation, is the fourth part of the distance between two cardinal points, which is 2° 48'.

QUARTER; that part of a ship's side which lies towards the stern, or which is comprehended between the aft-most end of the main chains and the sides of the stern, where it is terminated by the quarter-pieces.

QUARTER MASTER, in the navy; an inferior officer appointed to assist the mates in their several duties.

QUARTERING, in heraldry, is dividing a coat into four or more quarters or quarterings, by parting, couping, &c., that is, by perpendicular and horizontal lines, &c.

QUARTERS imply the several stations where the officers and crew of a ship of war are posted in time of action.

QUARTER SESSIONS. See *Courts.*

QUARTERING OF SOLDIERS. It was formerly taken for granted that it was the duty of subjects to give shelter and support to soldiers in the pay of their sovereign, both on their march and in their winter quarters. An ordinance was made on this subject in France, under Louis XII (1514); but this obligation of the citizens was abolished entirely, by the law of July 8, 1791, in regard to garrison troops; and soldiers on the march were to be entitled only to lodging, fire and light; thus the former numerous privileges of quarters belonging to the nobility and other classes, were set aside. In Germany, this subject formerly gave rise to much perplexity, on account of the double relations between the emperor and empire, and the territorial sovereigns and their subjects, and the particular obligations of the imperial cities towards the emperor, especially when Wallenstein, in the thirty years' war, began the system of requisitions by which he maintained his army not only at the expense of their enemies, but also at the expense of the allies of the emperor his master. The result of the consequent difficulties was, that, in treaties of peace and the laws of the empire, provision was made to prevent similar oppressions of the states of the empire. The quartering of troops became a most heavy burden on the people of Germany when, in consequence of coalitions against revolutionary France, French armies, by degrees, inundated all the German territory, and required both in hostile and allied states, sufficient means for their entire support, and generally still more. Many difficulties were created by this state of things. Several German works have been written on the proper distribution of the burden of quartering soldiers, and the indemnification for it.

QUARTEROONS; descendants of a mulatto and a white. The descendants of a quarteroon and a white are called *quinteroons.*

QUARTETTO: a musical composition for four instruments, generally stringed instruments, as in concert (i. e. two violins, one viol, and one violoncello); also a composition for four voices, with or without accompaniment. In instrumental quartettos Haydn opened a new path. Mozart, Beethoven, the two Rombergs, Spohr, Ries, Onslow, Fesca followed. The simple charm of harmony and melody gives the chief effect to the quartetto. The quartetto is better the more independent are the four voices; the predominance of one voice gives rise to the solo quartetto. Quintettos and sextettos, for stringed instruments, are often reckoned among the quartetto music.

QUARTZ; the name of a well-known mineral species, which surpasses all others in the extent of its distribution. It is also one of the most comprehensive in the varieties it embraces, which are especially numerous as respects colour, lustre and fracture. Its contents have very improperly been swollen, however, by the introduction of many substances which consist of mixtures of quartz with other species; and the difficulty of forming a correct idea of this group of minerals has been enhanced by their being separated into several species and sub-species, as has been done in certain treatises on mineralogy. We shall endeavour, in the first place, to take a scientific view of quartz; after which we shall point out those varieties which have, from various causes, obtained distinct appellations, together with the mixtures of quartz with other minerals, usually considered as varieties of the species; and, finally, the varieties which are employed in the arts.

The crystals of quartz are, for the most part, regular six-sided prisms, terminated at one or both of their extremities by six-sided pyramids, the faces of which correspond to the sides of the prism, and meet under an angle of 141° 40′. It sometimes happens that the prism intervening between the two pyramids is very short, or even extinct; in which case the form becomes the dodecahedron, with isosceles triangular faces. In the six-sided prism with pyramidal terminations, we often observe the solid angles, situated between the prism and the pyramid, replaced by rhomboidal planes. The alternate faces of the prism are striated horizontally. The primary form is a rhomboid of 94° 15′ and 85° 45′, parallel to whose planes cleavages may be obtained, as also to the planes of the dodecahedron, with isosceles triangular faces, which might also be regarded as the primary form of the species; but the former figure is preferred on account of its simplicity. Lustre vitreous, inclining, in some varieties, to resinous; colour white prevalent; among the brightest colours are violet-blue, rose-red, clove-brown and apple-green. Dark brown and green colours are generally owing to foreign admixtures. Streak white; transparent, translucent, frequently opaque, but never, perhaps, unless occasioned by other minerals; hardness between feldspar and spinelle; specific gravity 2.69. The crystals often present macles, and sometimes we observe larger crystals, apparently made up of innumerable smaller ones, all of which are so aggregated that their similar faces coincide as respects direction. Implanted globules, reniform and stalactitic shapes, are other modes of occurrence with compound varieties of this species. These have smooth, granulated and drusy surfaces; composition (mechanical) columnar, often impalpable, and frequently a second time composed into granular or curved lamellar masses. The massive varieties present a granular or columnar, and often an impalpable composition, in which case the fracture becomes conchoidal and splintery. Sometimes a second composition produces indistinct granular or thick lamellar masses. Certain very thin columnar compositions, if cut *en cabuchon*, parallel to the fibres, show an opalescent light. We have pseudomorphous crystals, also, of this species, in the shape of cubes, octahedrons, and various other forms, derived from fluor, calcareous spar, gypsum, &c., besides which, quartz occurs in globular and tuberose masses, formed in vesicular cavities, and also in plates and pebbles.

The principal varieties of quartz, which are known by distinct names, are the following: 1. *rock crystal;* 2. *smoky quartz;* 3. *yellow quartz;* 4. *amethyst;* 5 *siderite*, or *blue quartz;* 6. *rose quartz;* 7. *milky quartz;* 8. *irised quartz;* 9. *common quartz;* 10. *fat* (*greasy*) *quartz;* 11. *flint;* 12. *hornstone;* 13. *Lydian stone;* 14. *floatstone* (*swimming stone*); 15. *fibrous quartz;* 16. *radiating quartz;* 17. *chalcedony;* 18. *carnelian;* 19. *chrysoprase;* 20. *agate*. Rock crystal is applied to the transparent and colourless crystals, and more particularly to those of a large size. Smoky quartz consists of those crystals and crystalline masses which are translucent and of a brown colour. Yellow quartz, sometimes called, also, *Bohemian* or *Scottish topaz,* is transparent, and of various shades of yellow. Amethyst, also in crystals, and for the most part nearly transparent, is of every shade of violet. Siderite, or blue quartz, is never in regular crystals, but usually compact, and of an azure-blue colour. Rose quartz is confined to translucent massive varieties, of a delicate rose-red colour. Milky quartz is also massive, having an uneven fracture, is translucent, and of a milk-white colour. Irised quartz embraces such crystallized varieties as exhibit in patches, at or beneath the surface, the colours of the rainbow. Common quartz differs from milky quartz simply in being destitute of the milky whiteness of that variety, or in having an inferior degree of whiteness, and more of a vitreous lustre. Fat or greasy quartz differs from common quartz merely in lustre, which, instead of being vitreous, has the appearance of having been immersed in oil. Flint has a more compact texture than common quartz, is dull, only translucent on the edges, of a brownish colour, and breaks with a conchoidal fracture. Hornstone closely resembles flint, from which it can scarcely be distinguished, except in its conchoidal fracture, which is much less distinct. When replacing the fibres of wood, it is called *woodstone*. Lydian stone, sometimes called *flinty slate*, differs from flint chiefly in having a darker colour, less translucency, and a fracture somewhat slaty; when black, it is often called *bassanite*. Floatstone consists of a delicate tissue of minute crystals, visible only under a powerful magnifier. Owing to the cavities it contains, it sometimes will float on water. Fibrous quartz consists of those varieties which are in distinct, parallel concretions. Radiating quartz is like fibrous quartz, except that the fibres diverge from a common centre, and resemble the radii of a circle, instead of being parallel. Chalcedony includes those varieties of radiating quartz, where the thickness of the individuals becomes so much diminished as to render them nearly or altogether impalpable; its masses generally offer a mammillary or stalactitical surface, and the lustre on freshly-broken surfaces is feeble. Carnelian differs from chalcedony merely in having a blood-red colour. Chrysoprase also resembles chalcedony in composition, excepting that the individuals of which it is made up, appear to be grains instead of fibres; its colour is apple-green, from the oxide of nickel. Agate implies the occurrence of two or more of the above varieties, existing together in intimate union; or it may be applied to a single variety, provided it offers different colours in the same specimens.

Those substances which have formerly been included under quartz, and which are mixtures only of this mineral with other species, are the following: 1. *cat's eye;* 2. *avanturine;* 3. *prase;* 4. *plasma;* 5. *heliotrope;* 6. *iron-flint;* 7. *Compostella hyacinth;* 8. *jasper* (*red, brown, striped* and *porcelain*); 9. *jasper-agate;* 10. *Mocha stone;* 11. *Venus-hair agate*. Cat's eye consists of transparent quartz traversed by exceedingly delicate parallel fibres of asbestus; when cut *en cabuchon*, it exhibits, as its position is altered to the eye, a peculiar play of light upon its surface, resembling the changeability of light seen in the eye of a cat. Avanturine is quartz penetrated by small golden-coloured spangles of mica. Prase is quartz penetrated by green fibres of hornblende, which are often so small as to escape detection by the naked eye, and their presence is only discoverable from the green colour they impart. Plasma is a variety of chalcedony, coloured leek-green by some substance not yet examined. Heliotrope is likewise a variety of chalcedony, but coloured by green earth, and occasionally dotted with minute portions of red jasper. Iron flint consists of quartz, intermingled throughout with oxide of iron. The Compostella hyacinth is a red variety of iron flint, in regular six-sided prisms, with pyramidal extremities, which occurs imbedded in gypsum. Jasper differs from the two last varieties in being massive, and in containing variable proportions of clay. Red and brown jasper simply allude to the colour of the compound. Striped jasper appears to contain a larger portion of clay, and is distinguished on account of its striped delineations. Porcelain jasper is regarded as siliceous slate altered by heat, and is found in the vicinity of coal-mines. Those varieties which are found in rounded masses, and which, from the concentric layers of which they consist, appear to have been formed in open spaces, are called *Egyptian jasper.* Jasper agate consists of those varieties of jasper in which several colours are so arranged as to produce an agreeable effect. Mocha stone consists of agate, containing appearances of vegetable filaments, which have been occasioned through the infiltration of iron and manganese through its crevices. Venus-hair agate consists of quartz traversed by delicate hair-shaped crystals of any kind. The most transparent varieties of quartz are pure silex, which, according to Berzelius, contains 49.70 silicon and 50.30 oxygen. Hornstone, flint and chalcedony agree with it in composition. Several varieties contain small quantities of alumine, lime, oxide of iron, &c. Chrysoprase contains 0.01 oxide of nickel. Quartz is infusible before the blow-pipe, and shows itself to be pure silex. It is dissolved by soda easily, and with effervescence. Two pieces rubbed together emit an empyreumatic odour, and a phosphorescent light. Crystals of quartz may be obtained from a solution of silica in fluoric acid, or in potash diluted with water. The fluid from which crystals of this species are formed, in geodes and other natural cavities of rocks, has been observed to be chiefly water.

With respect to the distribution of quartz, and which we have remarked above to be the most abundant mineral known, it may be said that common quartz enters into the regular mixture of various rocks, of granite, gneiss, mica slate, topaz rock, &c. In others, it occurs in single crystals and in grains, as, for instance, in porphyry, and is frequently met with in the vesicular cavities of amygdaloidal rocks. In these last situations, in particular, are found the finest varieties of chalcedony, carnelian, of jasper and agate. Hornstone forms globules and irregular veins in compact limestone; and flint occurs in a similar manner, but disposed through vast beds of chalk. Quartz, also, occurs in rocks, of which it does not form a regular ingredient; sometimes in masses that are open in their interior, and lined with crystals of enormous size. It also exists in beds by itself, as in quartz-rock, and some varieties of sandstone. Striped jasper and flinty slate form, also, particular beds. The varieties, praseand chalcedony, as well as amethyst, are often found in beds of iron ore. River sand, and that of extensive plains, where it is sometimes so fine as to drift before the wind, are formed chiefly of quartz. Common quartz, and several other varieties, are spread all over the earth, but certain varieties are confined to a few localities. The finest and largest rock crystals are found in the Alps of Salzburg, the Tyrol, Switzerland, Dauphiny, Piedmont and Savoy; also in the isle of Madagascar, Ceylon and Brazil. About 100 years ago, a great drusy cavity, lined with these crystals, was opened in Zinken, which afforded 1000 cwt. of rock crystal, and, at that early period, sold for nearly £7,000. One crystal weighed eight cwt.; others from four to five cwt. The Alps furnish the handsomest specimens of smoky quartz. This variety has, of late, been brought, in large crystals and crystalline masses, from Nova Scotia. The yellow quartz comes from Brazil and Bohemia. A variety, intermediate between the smoky and the yellow, occurs at Cairngorm, in Scotland. Amethysts, of various colours, are brought from Brazil, but those of the finest colours come from Ceylon, India and Persia. A variety, intermediate between amethyst and smoky quartz, is found in Siberia. Amethyst also abounds in Transylvania and Hungary. Few localities of this beautiful variety are known in North America. Nova Scotia affords it in limited quantity; and a spot near Bristol, in Rhode Island, deserves to be mentioned for the fine crystals it has produced. Rose quartz occurs at Rabenstein, in Bavaria and in Siberia; but no locality produces in so great perfection as that at Paris, in Maine. Prase comes from the mining district of Schwartzenberg, in Saxony, and from Cumberland, in Rhode Island. Smalt-blue chalcedony, sometimes in pseudomorphous crystals, occurs at Tresztyan, in Transylvania; the stalactitic shapes are found in Iceland and the Faroe islands in amygdaloid, at Huttenberg and Loben in Carinthia; also in Hungary, Scotland and Cornwall. Carnelian is brought from Arabia, India, Surinam and Siberia. Chrysoprase exists at Kosemutz, in Silesia, and at Newfane, in Vermont. At this last-mentioned locality are found small prismatic crystals of quartz, deeply tinged by oxide of nickel. Chalcedony and carnelian are occasionally found, constituting very handsome agates, near Deerfield, in Massachusetts, and and at Southbury, in Connecticut; they are also brought from Nova Scotia—in each of which places they occur in trap. Plasma is found in Moravia and in Bavaria. Flint is common in England, France, Poland, and Spain. Hornstone is abundant in many countries. Flinty slate forms beds, and occurs in pebbles, in Bohemia, Silesia, Saxony, in the Western States of the United States, and in the Canadas. Fibrous quartz is found in the Hartz; cat's eye in Ceylon, and the coast of Malabar; and avanturine at the cape de Gat, in Spain. Heliotrope was formerly brought from Ethiopia, but is now generally obtained from Bucharia, from Tartary and Siberia. Iron flint, or ferruginous quartz, is frequent in the iron-stone veins of Saxony, Bohemia, Hungary, Transylvania, &c. The Compostella hyacinth occurs near Compostella, in Spain. Striped jasper is found in Siberia, at Grandtstein, in Saxony, at Ivybridge, in Devonshire; the brown Egyptian jasper comes from the banks of the Nile; the red variety from Baden, also from the town of Saugus, near Boston, in Massachusetts.

Several varieties of quartz are of important use in the arts and manufactures, and have long been employed for purposes of decoration and utility by mankind. The ancients regarded rock crystal as petrified water; they esteemed it, particularly, for the fabrication of vases, especially when it could be procured in large pieces. Such were the two cups which Nero dashed to pieces when he received the news of the revolt which caused his ruin, one of which had cost him a sum equal to £675. At present, it is esteemed, not only for cups, urns, chandeliers, but for seals, spectacle glasses, and optical instruments. Amethyst takes a fine polish, and is much employed in jewelry. Its colour, when dark blue, is well adapted to that of gold, in which metal it is always set. The ancients were much in the habit of engraving upon this variety of quartz. The rose quartz is cut into vases and cups, and, when of a delicate colour, and free from flaws, is highly esteemed. The yellow quartz is one of the most frequent stones employed for watch seals, having almost entirely supplanted the carnelian, which was formerly so much in vogue; it is called *topaz* by the jewellers. Chalcedony receives a high polish, exhibiting a slight degree of unctuosity. The ancients have left us many beautiful specimens of this variety of quartz, wrought into cameos and cups. They obtained it from the region of the Nasamones, in Africa, and from the environs of Thebes, in Egypt. The Japanese cut an immense quantity of carnelian into the form of the fruit of the olive, which they perforate, to be worn as beads. The carnelians, which are sold at Bombay, are brought from the province of Guzerat, in India, and the finest pieces come from the gulf of Cambay. Lapidaries distinguish two varieties of carnelian, viz. those having a pale colour, with a tinge of yellow, and those of a lively and deep-red colour. The last are the most rare, and the most highly esteemed, also, on account of their beauty. The Japanese are said to possess the art of heightening the colour of the pale carnelians. What is called *white carnelian*, is simply chalcedony. The carnelian was much in vogue among the Romans; and the moderns possess numerous specimens of ancient workmanship in this stone. The sardonyx (an intermixture of chalcedony and carnelian, the colours fading gradually together, and not arranged in distinct lines) was also in high estimation, in early times, and still continues to be employed in jewelry. The onyx, or banded agate, which exhibits two, three or more colours, disposed in parallel lines, constituted the most valuable material for the exercise of the glyptic art, as the workman was enabled to make use of the different colours to represent his subject in a natural manner; for example, the white and the red of chalcedony and carnelian were devoted to the representation of human flesh, while black, green, yellow, &c., were appropriated to drapery and other parts of his design. Among the finest cameos of ancient execution, may be mentioned the following, now preserved in the royal library of Paris: the Apotheosis of Augustus; the Mysteries of Ceres and Bacchus; the Apotheosis of Germanicus (which is engraved upon an onyx of four differently coloured bands, and in which Germanicus is represented as borne on the wings of an eagle); Tiberius; a Quarrel between Neptune and Minerva. The onyx, as well as the heliotrope and agatized wood, are also cut into thin plates for various kinds of inlaid work. The most important applications of this species to useful purposes, depend upon its being composed of silex. Quartz enters into the composition of glass, both white and coloured. It is added to the mass of porcelain, in the state of an impalpable powder, and forms part of the paste, also, in other kinds of pottery. It is used as a flux in the melting of several kinds of ores, particularly those of copper, and in other metallurgical processes. The use of flint in gun-locks is well known. Lydian stone is employed for trying the composition of mixtures of gold and silver. Sandstone yields various applications for architectural and other purposes, as the construction of melting-furnaces, millstones, &c. A variety of sandstone from Villa Rica, in Brazil, which is flexible, deserves to be spoken of in this place. Its flexibility is probably owing to scales of mica disseminated through its mass. Sand, with slaked lime, forms mortar. It is also used, in some countries, for the improvement of roads.

QUASSIA. The *quassia simaruba* is a tree of moderate size, inhabiting various parts of intertropical America, in a sandy soil. The bark, both of the trunk and roots, is of a pale yellow colour, and gives out a yellowish, milky and bitter juice. The leaves are alternate, very large, and pinnate, composed of alternate and almost sessile leaflets, and destitute of a terminal one. The flowers are monœcious, and disposed in large axillary panicles; and the fruit is composed of five capsules, each having the form and size of an olive. The bark is the purest bitter known, and has long been employed by the inhabitants of Guiana. It is found, in commerce, in the form of long, rolled strips.

The *Q. amara* is a lofty tree, not unlike the common ash in its general appearance, inhabiting the same countries. The flowers are in terminal racemes, and of a bright red. All parts of the tree are intensely bitter, but the bark is now esteemed the most powerful. Quassia has no sensible odour. Its taste is that of a pure bitter, more intense and durable than that of almost any other known substance. It is said to be sometimes used in brewing malt liquors, as a substitute for hops.

QUATRAIN, in versification; a strophe of four verses; for example, the two first strophes of a sonnet; but the quatrain may form an independent whole.

QUATRE-BRAS AND LIGNY, BATTLES OF, on June 16, 1815. These two battles are to be considered as the first act of the great and bloody drama of Waterloo. (q. v.) Napoleon's plan, at the opening of the campaign of 1815, was to fight his enemies singly, as he felt himself unequal to meet their combined forces. The chief purpose of his movements, therefore, was to anticipate their concentration. The Russians and Austrians, yet on their march towards the Rhine, might be left out of the calculation; but Wellington, with 102,000 British, Netherlandish, and Brunswick troops, and Blucher, with 120,000 Prussians, were near the French frontiers, between Brussels and Liege, yet in detachment cantonments, on account of the difficulty of obtaining provisions. Their united forces were much superior to those of Napoleon, which, according to the French accounts, amounted to 150,000. It was, therefore, necessary for him to prevent the union of Wellington and Blucher, and to beat them separately. Several circumstances held out a prospect of success; he was perfectly acquainted with the ground, could determine how much time was necessary to concentrate the different corps of the enemy; and Blucher and Wellington would need at least two days to effect a union. Blucher, as the most hasty, was to be first attacked, and driven back to the Rhine; after which it would not be difficult to beat the more cautious Wellington. The calculations seemed excellent, but were not successfully accomplished. Napoleon found the enemy, on the morning of June 15, yet apparently in perfect quiet. His rapid advance, in three columns, over the Sambre, towards Charleroy, was equivalent to a surprise. The first Prussian corps, under general Ziethen, forming, as it were, Blucher's advanced guard, retired, according to standing orders, with equal skill and coolness, though not without considerable loss, towards Fleurus, gaining time, as had been intended, to concentrate the other corps, and prepare for action in the rear of Fleurus. Towards noon, Napoleon, then at Charleroy, developed his plan more fully. On the road leading north from Charleroy to Brussels, which is thirty miles distant, lie the positions Gosselies, Frasnes, Quatre-Bras (a hamlet consisting of a few houses, where the road from Nivelles to Namur crosses, in a south-easterly direction, that to Brussels), Genappes and Waterloo. On this road, marshal Ney was ordered to advance with the first and second divisions, and the cavalry belonging to them (42,000 strong), to Quatre-Bras, to drive every thing before him, and to prevent, at any sacrifice, the approach and junction of Wellington, who was expected to advance from Brussels. Ney, therefore, commanded the left wing of the French army, and formed the wedge which Napoleon proposed to force between the British and Prussian armies, while he threw himself upon Blucher. Ney's charge seems to have been a difficult one: it appears from the complaints and the justifications of his conduct, that the emperor, by a certain indistinctness in his orders, placed him in the disagreeable situation of being obliged to act according to circumstances. Ney executed his orders literally; that is, he advanced, on the 15th of June, as far as Frasnes, his outposts being beyond that place, in the direction of Quatre-Bras, where they encountered an advanced post of the prince of Orange's corps, which prince Bernard of Weimar had thrown forward from Quatre-Bras. This post was maintained; and night coming on prevented any examination of what was passing behind it. During the whole day, Ney had heard a warm cannonade in his rear (caused by the action between Vandamme, Grouchy and the first Prussian corps near Fleurus), which forbade him to calculate on a very rapid advance of the French. This circumstance induced him to act with caution: he remained at Frasnes. It cannot be doubted that the brave resistance of the first Prussian corps, which Vandamme and Grouchy were not able to drive back quickly enough, was unexpected by Napoleon. He had probably expected to penetrate beyond Fleurus, on the 15th, with his main body. On the night of the 15th, the British forces, sensible of Napoleon's object, advanced on the road from Brussels towards Quatre-Bras, in order, if possible, to support the Prussians; and Blucher got his first, second, and third divisions in position to the north of Fleurus, having the British on his right, and expecting his fourth division, under Bulow, from Liege. His position was on a chain of heights imperfectly covered by the Ligny, a small stream, and dependent upon the possession of the villages St Amand, Ligny, Tongrines, and Sombref in front: in the rear it was intersected by the road from Quatre-Bras to Namur. Napoleon, having examined his disposition on the morning of the 16th, and it being necessary to rest his troops, ordered an attack in the afternoon. Ney again received orders to press forward on Quatre-Bras, to drive out the English before they could be concentrated, and to make a diversion in the Prussian rear, leaving his first corps under general Erlon, 20,000 strong (nearly half of his whole force), as a reserve at Frasnes, which might support him or Napoleon, as necessity should require. Some French writers have accused Ney of dilatoriness, while others have defended him from this charge. (See Gourgaud's *Campaign of* 1815, with the counter statements of Gamot and Marchand.) It is certain that he did not fully develope his forces before four o'clock in the afternoon, when he made his attack on Quatre-Bras, after the prince of Orange, with the Netherlandish troops, the duke of Brunswick, with his corps, and the Hanoverian and British divisions, under Alten and Picton, had already arrived and taken position. Although the junction between Blucher and Wellington was not accomplished on that day, yet Ney's attack was repulsed, notwithstanding his superiority, in the beginning of the action, in cavalry and artillery, of which his opponents were almost completely destitute, and in spite of the uncommon valour displayed by his troops. Wellington, on the Nivelles road, with his right wing resting on Quatre-Bras, and the wood defended by the duke of Saxe-Weimar, and his left on the village of Piermont, held Ney a check so successfully, that, in the evening, new British reinforcements continuing to arrive, the former was forced to send for his reserve at Frasnes, and, finally, to make a retrograde movement, and leave the field to the British. The loss on both sides was nearly equal, amounting to about 10,000 men, among whom was the duke of Brunswick. Napoleon began his attack on the Prussians at three o'clock in the afternoon, in two columns. The third French division, under Vandamme, advanced against the Prussian right wing at St Amand; the fourth, under Gerard, pressed forward towards Ligny; Grouchy, with the cavalry, occupied the attention of the Prussian left wing, under Thielemann, near Sombref. Vandamme's attack was, at first, not without effect, but, towards five o'clock, was repelled so effectually that Napoleon desisted, and, as Ney's diversion in the Prussian rear was not effected, directed his attention upon Ligny. The Prussians had, from the beginning, considered the possession of this village as of the greatest importance. Here the battle raged with the greatest fury, and the ground was covered with the dead and wounded. Gerard had sacrificed nearly his whole division for the possession of one half of the village, separated by the rivulet of the same name from the other half. He was unable to penetrate farther; nor could the Prussians, on the other hand, dislodge him by the most vigorous attacks. If the fourth division, under Bulow, had arrived at this moment, it would have decided the fate of the day; but a variety of obstacles retarded it. The evident relaxation in Napoleon's attack on the right wing gave the Prussians an opportunity of obtaining an apparent advantage in that quarter. All the disposable reserves were directed towards that point, when Napoleon unexpectedly threw himself upon Ligny. He now accomplished his purpose by means of his guards, who passed the Ligny on the right and left of the village, and threatened to cut off the exhausted Prussians, which would have been the more easily effected, as the reserves and artillery had been withdrawn. Blucher attempted in vain to repel the French cuirassiers, with about 1000 light cavalry. He was in such danger, on this occasion, that he was only saved by the darkness, almost by a miracle. (See *Blucher.*) Nothing remained but to abandon Ligny, and retire with his first and second divisions, in large bodies, upon Wavre, whither, towards midnight, the third division, which had been less actively engaged during the day, followed. Napoleon overrated the loss of the Prussians, and allowed them to retire unmolested, probably because his troops were too much fatigued, and required rest to be in a state to be led against Wellington. Grouchy, Vandamme, and generals Excelmans and Pajol, received orders, on the 17th, to follow the Prussians, with 35,000 men; but they had lost sight of them in the beginning of the pursuit—a circumstance which, with Grouchy's affair at Wavre, had a great influence upon the events at Waterloo. In the battle of Ligny, the Prussians were superior in number. They lost about 20,000 men and fifteen cannons, partly in consequence of their confined position. Napoleon had brought only about 60,000 men into battle, his sixth division not having reached Fleurus till dark; and the loss marched back and forward to and from Frasnes, without taking part in the action; whether in consequence of its original orders, or from misunderstanding, or from the wish of its commander to participate in the battle of St Amand, has not been clearly explained. The loss of this corps was of the most fatal consequence to Ney. The French accounts gave their loss at Ligny at from 6 to 7000. After Wellington had learned the issue of the battle at Ligny, he retired from Quatre-Bras in the forenoon of the 17th, and was followed by Napoleon. See *Waterloo*.

QUATUORDECIMIANS. See *Sects*.

QUEBEC, city; the capital of Lower Canada, on a promontory on the north-west side of the river St Lawrence, 180 miles below Montreal, nearly 400 from the sea, 700 west by north from Halifax, and 740 from Washington; lat. 46° 47′ N.; lon. 70° 56′ W. The population of the city and suburbs is stated by Bouchette (British Dominions in North America, London, 1831, 2 vols. 4to.) at about 30,000. By far the greater part of the inhabitants are Roman Catholics, and the French language is most in use. The promontory on which Quebec is built, is formed by the St Lawrence and St Charles, and is the termination of a ridge of land, generally from one to two miles wide, which runs from east to west. On the north it has the bold promontory of cape Diamond, rising almost perpendicularly 345 feet above the water; and across it at the north-east, or lower end, the city is built. The fortifications extending across the peninsula, shut in the ground on which the city stands, the circuit of which is about two and a half miles. It is divided into two parts, upper and lower. Upper Quebec is situated on the side of cape Diamond, which slopes to the north, towards the river St Charles. It is separated from the lower town by a line of steep rocks, which run from the cape towards the west. The lower town is situated immediately under cape Diamond, on ground considerably raised, to prevent its being overflowed, as formerly, at flood tide. The streets run from the upper side of cape Diamond down to the St Charles, a distance of about half a mile. They are of considerable breadth, and the houses are large and commodious. The houses next the river have very extensive warehouses attached to them, and vessels come close to the wharves to discharge their cargoes. The communication from the lower to the upper town is by a winding street, at the top of which is a fortified gate. "Quebec," says professor Silliman, "for an American city, is certainly a very peculiar town: a military town—most compactly and permanently built—stone its sole material—environed, as to its most important parts, by walls and gates—and defended by numerous heavy cannon—garrisoned by troops, having the arms, the costume, the music, the discipline of Europe—foreign in language, features, and origin, from most of those whom they are sent to defend—founded upon a rock, and in its higher parts overlooking a great extent of country—between three and four hundred miles from the ocean—in the midst of a great continent, and yet displaying fleets of foreign merchantmen, in its fine capacious bay, and showing all the bustle of a crowded seaport—its streets narrow, populous, and winding up and down almost mountainous declivities—situated in the latitude of the finest parts of Europe—exhibiting in its environs the beauty of a European capital, and yet, in winter, smarting with the cold of Siberia—governed by people of different language and habits from the mass of the population—opposed in religion, and yet leaving that population without taxes, and in the full enjoyment of every privilege, civil and religious. Such are some of the important features which strike a stranger in the city of Quebec." The upper town is the seat of government, and the principal residence of the military. Great improvements have recently been made in the style of buildings, and many of the private dwellings, and several of the public buildings are spacious and elegant. There is a French seminary or college, containing usually more than 200 pupils; but much less attention is paid to education than in the principal cities of the United States. Quebec is better fortified than any other town in America. Its strength has been greatly increased within a few years. It is so well defended at all points, as to render it abundantly adequate to repel any force that could approach it. The basin or harbour of Quebec is very beautiful, safe, and spacious; it is sufficient to contain 100 sail of the line. The depth of water is twenty-eight fathoms; the spring tides rise twenty-three or twenty-four feet, and the neap tides seventeen or eighteen. The river St Lawrence is twelve miles wide above the city, but is here contracted to one mile in breadth. The exports consist principally of timber, grain, flour, furs, and pot and pearlashes. The trade is very extensive, and is principally confined to British vessels. Amount of imports in 1829, £824,392. Quebec was settled by the French in 1608, taken by the English in 1759, and ceded to them in 1763. In 1770, an unsuccessful attack was made upon it by the Americans under general Montgomery, who fell, together with about 700 men.

QUEDLINBURG, a town in the Prussian government of Magdeburg, province of Saxony, is situated at the foot of the Hartz mountains, and contains 12,000 inhabitants. It is a place of considerable industry; its distilleries are important, and many swine are fatted for sale. Among its public establishments is an institute for juvenile offenders. Quedlinburg is the native place of Klopstock. The town owes its origin to the foundation of a religious house for ladies there, between 932 and 936, by king Henry I. The abbess, from 1539, a Lutheran, was a member of the estates of the empire.

QUEEN (Anglo-Saxon, *cwen*, the wife); the wife of a king. In Britain, the queen is either *queen-consort*, or merely wife of the reigning king, who is in general (unless where expressly exempted by law) upon the same footing with other subjects, being to all intents the king's subject, and not his equal; or *queen regent*, regnant, or sovereign, who holds the crown in her own right, and has the same powers, prerogatives, and duties, as if she had been a king (see *Britain*), and whose husband is a subject, and may be guilty of high-treason against her; or *queen-dowager*, widow of the king, who enjoys most of the privileges which belonged to her as queen-consort. It is treason to compass or imagine the death of the queen-consort, and to violate or defile her person not only renders the person committing the act guilty of treason, but also the queen herself, if consenting. If the queen be accused of treason, she is (whether consort or dowager) tried by the house of peers. Queen Caroline was proceeded against by a bill of pains and penalties. (See *Laws of Exception*.) By act of parliament, August 2, 1831, the usual provision of £100,000 per annum, with the use of Marlborough house, was made for queen Adelaide, as queen dowager. In Prussia, Sweden, and France, the succession being confined to the male line, there can be no queen regnant. (See *Salic Law*.) In Spain (by royal decree of March 29, 1830), Portugal, &c.,

females are not excluded from the succession to the throne.

QUERCITRON, in dyeing; the internal bark of the *quercus nigra;* it yields its colour, which is yellow, by infusion in water, and by the common mordants gives a permanent dye.

QUERETARO; one of the states of the Mexican confederacy, formed in 1824, of the old intendency of the same name, which had been separated from that of Mexico in 1816. It is bounded by the states of S. Luis, Potosi, and Vera Cruz, on the north, by that of Puebla on the east, by Mexico on the south, and by Mechoacon and Guanaxuato on the west; square miles, 15,000; population, about 60,000. It lies entirely on the central plateau of Mexico, which is about 6000 feet above the sea. The climate is temperate, and the productions are maize, wheat, European fruits, &c. (See *Mexico.*) Queretaro is one of the most manufacturing states of the union. Its capital, of the same name, with a population of 35,000, lies in a pleasant valley, 6500 feet above the level of the sea; lat. 20° 36′ N.; lon. 100° 10′ W.; 112 miles north-west of the city of Mexico. It is one of the handsomest cities in Mexico, containing a magnificent cathedral, several convents, hospitals, &c.: the streets are well laid out, and there are several fine squares. The city is the seat of considerable manufacturing industry.

QUESNAY, FRANCIS, a French physician of some eminence, but chiefly noted as a writer on political economy, was born in 1694, and died at Paris in 1774. His father was a farmer, and he acquired the rudiments of his profession under a country surgeon; after which, going to the metropolis, he became secretary to a society established for the improvement of surgery. At length he took the degree of M.D., and obtained the situation of physician to Madame de Pompadour, the mistress of Louis XV., and through her interest became physician to the king. Amid the intrigues of a licentious court, he observed a simplicity of manners and apparent disinterestedness which formed a strong contrast with the characters of those around him. Towards the latter part of his life, he became the founder of the political sect of the economists. (See *Physiocratic System, Political Economy*, and Laharpe's *Cours de Littérature*, 14th vol.) He was the author of various surgical and medical works, several articles in the *Encyclopédie*, and tracts on politics, including a treatise on Physiocrasy, or the Government most advantageous to the Human Race (1768, 8vo.).

QUESTORS; ordinary magistrates (see *Magistrates*) among the Romans, who managed the public treasury (*ærarium*), kept in the temple of Saturn, and superintended the receipts and expenditures of the public money. They were at first appointed by the kings, afterwards by the consuls, and after 307, A. U., by the people in the *comitia tributa*. At first there were two questors, in 333, A. U.; two others were added to assist the consuls in war. The two first remained in the city. After the Romans had conquered all Italy, four more were added: under Sylla there were twenty; under Cæsar, forty. After this period their number was arbitrary, but in Rome itself the number was always two, who were called, by way of distinction, *quæstores urbani*. The others were called *quæstores provinciales*, or *militares*. The questorship was the lowest office of honour, and opened the way to the senate; but it was sometimes filled by consular men.

QUEVEDO-VILLEGAS, DON FRANCISCO DE, a Spanish poet, was born at Madrid in 1580, and studied at Alcala de Henares. Besides the ancient languages, his course of studies comprised theology, medicine, and philosophy, as he was unwilling to devote himself to any professional pursuit. He combined extensive learning with much wit and great originality. In consequence of a duel, in which his adversary fell, he fled to Italy, where his services gained him the confidence and friendship of the duke of Ossuna. (q. v.) After having visited Germany and France, Quevedo returned to Spain, and on account of his connexions with the duke, then in disgrace, he was arrested and confined to his estate, La Torre de Juan, for three years. To restore his health, impaired by his confinement, he travelled through Spain, and afterwards lived in retirement on his estate where he probably wrote his poems published under the title of the Bachelor of La Torre. Philip IV. conferred on him the place of secretary, and, in 1634, Quevedo married the sister of the archbishop of Abarazin. But at the age of sixty-eight years, he was imprisoned for a libel on the duke of Olivarez, which was imputed to him without any proofs. He was released after two years' confinement, but his health had suffered much from his imprisonment. Being banished from court, he retired to his estate, which had been repeatedly plundered while he was in prison, and died at Villa Neuva de los Infantes, in 1645. His works are various in their character. His humorous productions are distinguished for playfulness, wit, and invention. His prose works are mostly effusions of humour and satire. His Visions (*Sueños*) have been translated into most European languages (English, by L'Estrange); his *Vida del Gran Tacano* is a comic romance of the sort called by the Spaniards *picaresco*. He also translated the *Enchiridion* of Epictetus into Spanish. His works were published at Brussels, in three volumes quarto, in 1660 and in 1670, and have since been repeatedly reprinted.

QUI VIVE (who lives?); the challenge of the French sentries to those who approach their posts, equivalent to the English "Who goes there?" To be on the *qui vive* is to be on the alert, like a sentinel.

QUIBERON; a peninsula on the western coast of France, in the department of the Morbihan, containing the town of Quiberon (2000 inhabitants) and several hamlets. June 27, 1795, a body of 1200 or 1500 *émigrés*, under the command of the count d'Hervilly, landed on this coast and took possession of the peninsula. Their numbers were increased by several thousand royalists; but they were soon compelled, by the advance of the republican forces under Hoche (q. v.) to shut themselves up in the peninsula, under the protection of fort Penthièvre, situated on its isthmus, and of the English squadron, by which they had been brought over. Six thousand Chouans (q. v.), with their wives and children, followed them thither. Hoche now besieged the peninsula. July 16, d'Hervilly attempted a sortie, in which he fell. On the 17th, a reinforcement of *émigrés* landed, under command of Sombreuil. On the 21st, the fort was taken by the republicans, who penetrated into the peninsula; and on the 22d Sombreuil surrendered, with 4000 men, after a brave resistance. The young Sombreuil, (28 years old) whose father and brother perished under the guillotine, during the revolution, and about 200 of the royalists, were shot. In 1829, a chapel was erected here, containing a marble monument to the memory of the *émigrés* who fell on this occasion. See *Vendée*.

QUICK, OR QUICKSET HEDGE, among gardeners, denotes all live hedges of whatsoever sorts of plants they are composed, to distinguish them from

dead hedges, but in a stricter sense of the word, is restrained to those planted with hawthorn.

QUICKLIME. See *Lime*.

QUICKSILVER. See *Mercury*.

QUIETISM. The ceremonial and hierarchical spirit of some monastic orders, especially of the Jesuits and Dominicans, had in the seventeenth century, almost converted religion, among the Catholics, into a mere mechanical service. The repetition of forms of prayer from the breviary, and on the rosary, fasting, confession, frequent pilgrimages, invocations of the mother of God and of saints, almsgiving, the purchase of indulgences, and, in a word, the minute observation of external forms, came to be viewed as real piety. Pious minds disposed to a more earnest devotion, turned with ardour to mysticism, which afforded refuge and spiritual aliment to the more feeling soul, when all religion seemed to have become petrified in the forms of ritual observances. The Spiritual Guide, (*Guida Spirituale*,) a work published at Rome, in 1675, by Michael Molinos, a Spanish priest, answered this want. With an enthusiasm which soon gained favour to his pious fancies, Molinos spoke of the tranquillity of a soul absorbed in the Deity, which dead to all other thoughts and feelings, and disturbed by no outward events, had perception of nothing but the presence of God. In obedience to his instructions, the devout now sought solely this tranquillity of soul (*quies* Latin, *rest*, whence *Quietism* and *quietists*; in Greek, *Hesychastes*;) and no opposition would have been made to them, but for the danger that the devotional exercises enjoined by the church and the monastic orders would appear superfluous. Molinos was obliged to abjure his errors, and terminated his life in daily acts of penance in a Dominican convent in Rome. (He died in 1696.) But this violence by no means prevented the diffusion of Quietism. The Spiritual Guide was eagerly studied, and produced a number of similar works in Germany and France, where the way had already been prepared for its reception, by the works of Bourignon (q v.), Poirets, and the Pietists. As early as the fourteenth century, there was a body of monks called *Hesychastes*, (also *Umbilianimi*,) who spent their whole time in prayer and meditation. (See *Hesychastes*.) The most celebrated promoter of Quietism in France, was a beautiful and rich widow, a favourite at the court of Louis XIV., Joanna Maria Bouvier de la Mothe Guyon, who under the name of Madame Guyon, is celebrated as an amiable enthusiast, of more imagination than judgment. Her example, her prayers, her works, replete with unction, and the exertions of her confessor Lacombe, gained her adherents enough to excite the attention of the clergy. There were, indeed, strong reasons for believing a young woman crazy, who imagined herself the pregnant woman of the Apocalypse, (xii. 2.) and who, in her own account of her life, says that she was often filled with such an overflowing of grace, that she was literally on the point of bursting, and that it became necessary to loosen her clothes; upon which this fulness of grace was poured out upon those who did her this service. Lacombe was thrown into prison at Paris, and died in confinement, in 1702; but Madame Guyon herself, after a short imprisonment, was restored to liberty, and had the honour of being allowed to take part in the prayers of Mad. de Maintenon at St. Cyr. The controversy therefore seemed at an end, when Fenelon (q. v.) thought he discovered in Mad. Guyon a kindred spirit, and became the advocate of her and her writings, in his *Explication des Maximes des Saints sur la Vie intérieure*, (1697.) The accession of so distinguished a man, whose works of devotion had been received in France with enthusiasm, gave new weight to Quietism, and an opportunity to Bossuet, the champion of the French theologians, to inflict disgrace on his envied rival. Bossuet obtained, in 1699, a papal brief, which condemned twenty-three positions from Fenelon's book as erroneous; but the humility with which he submitted, and which was admired even in Rome itself, deprived his enemies of the fruits of their victory; and it was the change in the spirit of the times, and not violence—though Mad. Guyon (who died 1717) underwent another short imprisonment,—that gradually buried Quietism in oblivion. It had never formed a sect; but for some years it continued to be the subject of works of devotion, and the peculiar opinion of a party among the pious. From Fenelon's book, in which Quietism is most clearly described, we learn that it was a harmless enthusiasm, adapted only to persons of a fanciful and exaggerated turn of thinking. Truth and falsehood are strangely blended in it; it requires pure love, which, without fear or hope, indifferent to heaven or hell, is directed with entire self-denial to God, merely because he wills it. The flesh must be mortified, every worldly feeling banished, all confidence in our own merits by good works abandoned, and the soul be transferred to a passive state in which its own activity ceases, and God alone works in it. This state, which unites the soul essentially with God, is tranquillity, or incessant internal prayer, (the permanent direction towards God,) in which nothing is desired, nothing asked from God, but, entirely resigned to him, the soul is contented with the pure contemplation of his being. Rarely as these precepts of Quietism can be put in practice, because they comport neither with the wants of human nature nor the demands of our social condition, they have, nevertheless, frequently reappeared in the mysticisms of later sects. The term has also been applied to the religious notions of the Indian bramins, whose object is to attain a state of holiness, by the destruction of all corporeal and intellectual activity, and thus to become incorporated with Brama. (See Mad. Guyon's Life by herself.)

QUILLS, for writing. See *Pens, Writing*.

QUILTING; a method of sewing two pieces of silk, linen, or stuff, on each other, with wool or cotton between them, by working them all over in the form of chequer or diamond work, or in flowers. The same name is also given to the stuff so worked.

QUIN, JAMES, an eminent English actor, born in London in 1693, was the son of an Irish barrister, and was educated in Dublin. His father had married a supposed widow, whose husband, after a long absence returned and claimed her; on which account Quin, who was the offspring of the connexion, was deemed illegitimate, and, upon his father's death, in 1710, was left without a fortune. This interruption of his prospects prevented him from being adequately educated for a profession, and he had recourse to the Dublin stage, in 1715, and in a year after secured an engagement at Drury-lane theatre. In 1717 he quitted Drury-lane, for the theatre in Lincoln's-inn-fields, where he remained seventeen years, and gradually acquired celebrity in characters of grave, dignified, and sententious tragedy, as in Cato, Zanga, and Coriolanus, and in those of strong sarcastic comic humour, as Falstaff, Volpone, and Sir John Brute. In 1732, he removed with the same company to Covent-garden, but in 1735, was induced to join that of Fleetwood at Drury-lane, on such terms as no actor had previously received; and he retained the pre-eminence until the appearance of Garrick in 1741. In 1747, he was engaged at Covent-garden with Garrick;

but the new actor obtained so great a share of attention as to have gradually induced Quin to retire. His last performance was Falstaff, (1753,) in which character he is supposed never to have been exceeded. He survived his retreat several years, which he spent chiefly at Bath, where his fund of anecdote and pointed sense, made him much sought after. Quin, who was convivial, and too fond of the bottle, was often coarse and quarrelsome on these occasions, which led to two or three hostile encounters, one of which proved fatal to his antagonist. He was otherwise manly, sensible, and generous; and his deliverance of Thomson, although then unknown to him, from an arrest, by a present of £100, is much to his honour. He died at Bath, in 1766, aged seventy-three. Garrick, once his rival, and afterwards his friend, wrote the epitaph for his monument in Bath Cathedral.

QUINA, or QUININA; a vegetable alkali extracted from pale cinchona. It exists in transparent plates, which are insoluble in water, and of a bitter taste. It unites with the acids, forming crystallized salts. The sulphate is of a dull white colour, silky and flexible. Like quina, it is soluble in alcohol, and burns away without leaving any residuum. A grain of pure sulphate of quina will render nearly a pound and a half of water sensibly bitter. When one grain is dissolved in about 300 grains of boiled distilled water, pure sulphate of quina will, on cooling be deposited, in feathery crystals, in twenty-four hours, if there be no adulteration. The alkalies and their carbonates cause a precipitation in water, containing a thousandth part of sulphate of quina; and a solution of tannin does so in a solution ten times more dilute. The sulphate is composed of quina 100, and sulphuric acid 10·9. The acetate of quina is remarkable for the manner in which it crystallizes. Its crystals are flat needles, of a pearly appearance, which are grouped in starlike bundles. The sulphate of quina in doses of from six to twelve grains, has been found an effectual remedy against intermittent fevers. It is said that the red or yellow bark yields the most febrifuge quina. The following is a good method for determining whether bark is rich in quina:—Digest alcohol on it in coarse powder till it be drained; precipitate the colouring matter by acetate of lead; filter and separate the excess of lead by a few drops of sulphuric acid; then filter and distil; when sulphate of quina will remain mixed with a fatty matter. Ammonia will now separate the quina.

QUINAULT, Philippe, the most distinguished of French opera writers, born in 1635, was the son of a baker, and had no advantages of education. Excepting some instruction in regard to versification by Tristan L'Hermite, he owed every thing to his own industry and talent. Even before the twentieth year of his age he brought out some plays, and, for several years, continued to write with success for the stage. His success, however, only rendered him a mark for the satire of Boileau, who attacked him with so much bitterness as to have injured his own fame. Quinault then abandoned tragedy, which he felt not to be his province, and, connecting himself with Lully, laboured for the opera. In this lyric department of poetry, he displayed such talents as to be placed above all his competitors, and to be ranked, by the best judges, among the most distinguished men of the age of Louis XIV. There is nothing in the French language more delicate, tender and ingenious than the turn of his songs and love dialogues. Boileau, and the other censurers of Quinault, attributed the success of his pieces solely to the merit of Lully's music; which, however, is now forgotten, while Quinault's verse is always read with pleasure. His *Armide*, (1686,) and his *Atys*, are masterpieces in their kind. Quinault, who was without experience in affairs of business, married the widow of a rich merchant, whose estate he had settled, and purchased (1671) the post of auditor in the chamber of accounts. He was soon after received into the French academy, and, in the name of that body, congratulated the king on his return from the campaigns of 1675 and 1677. The flattery which he employed in his prologues obtained him a pension. A melancholy, produced probably by the decline of his health, disturbed the happiness of his last years. He was filled with regret for having devoted his talents to theatrical productions, and determined to apply what remained of his powers to the honour of God and the king. He began a poem upon the extirpation of Protestantism in France, which, however, would only have diminished his reputation. He died in 1688. In society Quinault was polite, amiable, and kind. Besides his theatrical pieces, he was the author of several occasional poems. His works were published in 1739 and in 1778, in five volumes, with a life prefixed.

QUINCE (*cydonia vulgaris*); a low, tortuous tree, named after the ancient town of Cydon, in Crete, from which place it was said to have been introduced into the other parts of Europe; but it appears to grow wild in Western Asia and some of the neighbouring parts of Europe. It is now cultivated throughout Europe, and in many parts of the United States, for the sake of its fruit, which, though hard and austere when plucked from the tree, becomes excellent when boiled and eaten with sugar, or preserved in sirup, or made into marmalade. Quinces, when mixed with other fruit, in cookery, communicate a very pleasant flavour; and a delicious wine may be made from their juice, mixed with sugar in the proportion of one quart to the pound, and fermented. The leaves of the quince tree are simple, alternate and entire; the flowers are large, white, sometimes with a blush of rose, and are solitary at the extremity of the young branches; the divisions of the calyx are denticulated; and the fruit is somewhat pear-shaped, yellowish and cottony, internally containing five cartilaginous cells, in each of which the seeds are arranged in two series to the number of eight and upwards, and covered with a mucilaginous substance. The character of the numerous seeds is the principal circumstance in its structure, which distinguishes the quince from the apple and pear. The quince succeeds best in a light soil: if it be too rich, the fruit becomes insipid, and if too dry, it remains small and coriaceous. The *Cydonia Japonica* is a beautiful low bush, remarkable for the brilliancy of its flowers, which vary from the richest scarlet to the most delicate blush colour. It is very hardy, and is one of the most ornamental shrubs that can be placed in a garden. It is a native of Japan.

QUINCTILIANUS. See *Quintilianus*.

QUINCUNX, in Roman antiquity, denotes any thing that consists of five twelfth parts of another, but particularly of the *as*, or pound. See *As*.

QUINDECAGON, in geometry, a plane figure with fifteen sides and fifteen angles, which, if the sides are all equal, is termed a *regular* quindecagon, and *irregular* when otherwise.

QUININE. See *Quina*, and *Bark, Peruvian*

QUINQUAGESIMA; name of the Sunday before Lent, because fifty days before Easter; also called *Esto mihi*.

QUINQUETS; the French term for Argand lamps. See the latter part of the article *Lamp*

QUINSY; an inflammation of the throat; a species of angina, which renders respiration difficult, or intercepts it; also an inflammation of the fauces.

QUINTANE; a Roman military sport or exercise by men on horseback, formerly practised in England to try the agility of the country youth. It was tilting at a mark, made in the shape of a man to the navel, having a shield in his left hand, and a wooden sword in his right; the whole was made to turn round, so that if it was struck with the lance in any other part but full in the breast, it turned with the force of the stroke, and hit the horseman with the sword which it held in its right hand.

QUINTESSENCE (from *quinta essentia*, the fifth essence, by which the Pythagoreans meant the æther), in chemistry; the concentrated extract of the virtues of a substance; hence, in general, the purest, best, or highest state of a quality.

QUINTETTO, or QUINTETT (*Italian*); a vocal or instrumental composition in five parts, in which each part is *obbligato*, and performed by a single voice or instrument.

QUINTILIANUS, or QUINCTILIANUS, MARCUS FABIUS, flourished in the first century of the Christian era, and, at an early age, left Calaguris (now Calahorra), in Spain, the place of his birth, for Rome, where he first distinguished himself as an advocate, and afterwards as a rhetorician. Some of the most eminent Romans were his pupils, and the emperor Domitian bestowed on him the consular dignity. During the reign of that emperor, Quintilian wrote his excellent work, *De Institutione Oratoria*, which contains a system of rhetoric; it exhibits him as a practised master, a man of taste and talents, and a worthy imitator of Cicero. The tenth book, which contains his opinions of Greek and Roman writers, is particularly interesting, and important for the history of literature, and is characterized no less by acuteness than cogency of reasoning. There are also a considerable number of rhetorical speeches (*declamationes*) attributed to him, but they are not considered genuine. A treatise, *De Oratoribus sive de Causis corruptæ Eloquentiæ*, is often published with his works, but is also ascribed to Tacitus and to other writers. The best editions of Quintilian are Burmann's (Leyden, 1720, 2 vols., 4to.). Capperonier's (Paris, 1725, fol.), Gesner (Goettingen, 1738, 2 vols., 4to.), Spalding's (Leipsic, 1798—1816, 4 vols.), and Lunemann's (Hanover, 1826, 2 vols.).

QUINTUPLE ALLIANCE. See *Quadruple Alliance*.

QUINTUS CALABER, or SMYRNÆUS; a Greek poet, the time and place of whose birth are uncertain. His surnames are derived from the discovery of his poem in Calabria, and his mention of Smyrna as the place of his residence. He probably flourished in the fourth century A. D. His poem, Παραλειπομενα Ὁμηρου (Supplement to Homer), is a continuation of the Iliad, in which Homer is indeed imitated, but by no means equalled in grace and simplicity. The latest critical edition of this work, by Tychsen, with remarks by Heyne (Strasburg, 1807), was published at the expense of the Bipont society.

QUIPOS; a contrivance which supplied the place of writing among the Peruvians, at the time of the conquest of Peru by Pizarro, in the sixteenth century. It consisted of several threads of different colours attached to a cord, and tied in knots. Each colour had its peculiar signification; and, in case the sense could not be conveyed by the colours, the knots were used. By this means, calculations were carried on, enumerations of the population, historical documents and laws preserved, leagues and treaties indicated, &c. In each town there were officers whose duty it was to take care of the *quipos*. The defects of this species of writing were supplied by oral tradition and short poems. A somewhat similar contrivance was in use in Guiana. See *Writing*.

QUIRINUS, among the Romans; a surname of Mars, and, at a later period, of Romulus. It was derived from the Sabine word *quiris* or *curis*, which is said to have signified a spear, and figuratively a soldier; thence also the name *Quirites*, assumed by the Romans after the union of the Sabines, and applied to Roman citizens in harangues addressed to them. The terms *Quirinalia* (a festival in honour of Romulus), and *Quirinalis* (one of the seven hills of Rome), are of the same origin.

QUIT-CLAIM, in law, signifies a release of any action that one person has against another. It signifies also a quitting a claim or title to lands, &c.

QUIT-RENT, in law; a small rent that is payable by the tenants of most manors, whereby the tenant goes quit and free from all other services. Anciently this payment was called white-rent, because it was paid in silver coin, and to distinguish it from rent-corn.

QUITO; formerly an *audiencia* of New Grenada, more recently an integrant part of the republic of Colombia, bordering on Peru and the Pacific ocean. (See *Colombia*, *Sucre*, and *Venezuela*.) It is divided into the three departments of the Equator, Asuai, Guayaquil, and contains a population of about 520,000. principally Indians and mestizoes. An elevated part of the chain of the Andes traverses this country, and is divided into two ridges separated by a lofty plain, about twenty miles in breadth, on which most of the population is concentrated. The western ridge is from 100 to 200 miles from the ocean, and contains the summits of Pichincha, Chimborazo, &c. (See *Andes*.) The eastern ridge contains several volcanoes in activity. The low country yields maize and sugar, and the higher regions, corn. The climate, in general, is cold, and earthquakes often produce great ravages.

QUITO; a city of Colombia, capital of the department of the equator, 460 miles south-west of Bogota, and 850 north of Lima, lying at the foot of the volcanic mountain Pichincha, in lat. 13′ S., lon. 78° 45′ W., at an elevation of 6550 feet above the level of the sea. The streets, owing to the nature of the ground, are generally uneven and irregular, and are also narrow and badly paved. The houses are commonly of but one story, on account of the frequency of earthquakes, and built of unburnt bricks and clay. The city contains a cathedral and episcopal palace, seven other churches, numerous convents, several hospitals, and other public buildings. The population is differently estimated at from 40,000 to 70,000. The climate is mild, and almost the same throughout the year; but furious storms and earthquakes too often cause great ravages. Quito was taken by the Spaniards in 1534, and was for a long time attached to Peru, but, in 1718, was annexed to New Grenada.

QUIXOTE, DON. See *Cervantes*.

QUODLIBET (Latin, *as it pleases*) signifies any thing thrown together without order or connexion. Comic pictures, consisting of various disconnected fragments, poems, and musical pieces of a similar nature, are called *quodlibets*. (See *Potpourris*.) The more usual sense of *quodlibet*, in English, is a quibble.

QUORUM; a term used in commissions, of which the origin is the Latin expression, *quorum unum A. B. esse volumus* (of whom A. B. shall be one), signifying originally certain individuals, among several persons invested with power, without whom the others could not proceed in the business. Thus, among the justices of the peace, it was customary to name some eminent for knowledge and prudence, to be of the *quorum;* but all justices are now generally of the *quorum.* In legislative and similar assemblies, a *quorum* is such a number of members as is competent to transact business.

QUOTIENT; the quantity obtained by the process of division, or, in other words, the quantity which indicates how often the divisor is contained in the dividend; thus 3 is the quotient of 15 divided by 5.

R.

R; the eighteenth letter of the English alphabet, a lingual and a liquid or semi-vowel, as it can be pronounced before and after most consonants. This letter is pronounced in various languages, and in several instances even in the same language, in different ways. The most natural mode, at least that which is most agreeable to the ear, and most common in the various languages, is by an expiration, whilst the tongue touches the roof of the mouth with a tremulous motion,—the pronunciation of the English *r* at the beginning of a syllable, as *rhetoric.* This sound is still more distinct in the Spanish language, when one *r* ends a syllable, and another begins the next, as *zurra.* This tremulous motion of the tongue makes the pronunciation of *r* more difficult than that of any other letter in the alphabet, so that it is the last which children learn; and if the tongue is too thick, or is too closely joined to the lower part of the mouth, they do not learn it at all. Indeed, the sound of *r* is entirely wanting in some languages, as in that of the Delaware Indians and ancient Massachusetts stock. Among the Cherokees, those members of the tribe who live in the mountains (called *mountaineers*) change *r* into *l;* the others (now civilized) have always *l* instead of *r.* (See *L.*) Another pronunciation of the letter *r* is produced by curving the tongue towards the roof of the mouth, and pressing the upper part against the back part of the roof. This is the common pronunciation of the French *r;* and in this way the letter may be pronounced so much from the throat, as to partake considerably of the nature of a guttural. If the tongue is not pressed quite so much against the roof of the mouth, and the air is expired with less strength, we produce the sound which the English *r* has at the end of certain syllables, as in *perceive.* The English, and more particularly the Irish, are distinguished from the Americans, by drawing the tongue far back, and thereby preventing the air from escaping freely, which produces a peculiar rolling sound. You may distinguish an American and Englishman immediately, if they only wish you a "good morning."* The *r* loses its true pronunciation most, in the English language, when it follows *a,* in which case the *ar* is pronounced almost as the Italian *a,* only a little less open, with a slight guttural contraction. *R* after *e* and *i,* it is known, changes the pronunciation of the latter, in the English language, as in *perquisite.* (See article on the letter *E.*) The first pronunciation of *r* cannot be produced but by an expiration of considerable strength, which is the reason why, in many cases, it is written with a following *h,* or, in some languages which incline much to aspirate sound, is preceded by *h.* Adelung says that *r,* on account of its tremulous motion, is naturally used for expressing every tremulous motion, and, figuratively, every violent and sudden emotion, also quick repetition, intension, &c.; e. g. *tremere, ira, rash, irrer,* and the German frequentative syllable added to verbs (*ern*), which, in many cases, is changed into *eln.* The tremulous motion of this letter, moreover, produces, in speaking quickly, an uncertainty as to its preceding or following the vowel, so that *r* is transposed oftener than any other letter: *to burn,* in English, is *brennen* in German; *Brunn* and *Born* both, in German, signify a *well;* so there are the Latin *cerno* and *crevi, germen* and *gramen, pro* and *por;* the Greek *κρανίον* and *κάρηνον;* and innumerable other cases. As the pronunciation of *r* differs from that of *l* only by the tremulous motion of the tongue, it is natural that either of them should often take the place of the other. (For some remarks respecting both letters, see the letter *L.*) The pronunciation of the letter *s* is also much allied to that of *r,* as the tongue is in the same position only allowing the air to pass over the point, instead of shaking it. Hence, also, the frequent alternation of these two letters; as, *æs, æris; arena,* with the ancient Romans *asena; hare,* in German *Haas; was,* in German *war;* the German *Rohr,* in Ulphilas *Raas,* and in French *roseau,* &c. The R of the Romans was derived from the P (*rho*) of the Greeks. It is the *resh* of the Phœnicians and Samaritans, formed thus, ᑫ and ᑭ. The various forms of the P of the Greeks and Etruscans may be found in Mionnet's *Descr. de Médailles,* pl. xix. and xxi.—As a Roman numeral, it signified 80, according to the verse,

> *Octoginta dabit tibi R, si quis numerabit;*

with a dash over it, 80,000. With the Greeks, ρ with the accent over it, signified 100; with the same sign under it, it was 100,000. The Hebrew *resh* (ר) denoted 200, and (ר̈), 200,000. R, on ancient medals, signifies *Ravenna, redux, regia, restitutor, Roma, Romanus,* &c.; P. R., *populus Romanus;* R. P., *res publica;* R.C., *Roma condita;* R. M. S., *Romanus;* R.C., *rescriptum,* &c. Among the names, R signifies *Roscius, Rubrius, Regulus Rufus,* &c. R, in numismatic works, signifies *rare;* and the different degrees of rarity are indicated by one, two, three, &c. R stands, in modern times, for *rex,* or *regina.*—*Rx.* is *rix dollar.*

RAAB; a city of Hungary (anciently Jaurinum) on a river of the same name, at its confluence with the Danube; 16,118 inhabitants. June 14, 1809, the archduke John and the palatine of Hungary were defeated here by the French, under Eugene Beauharnais. (q. v.)

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* The London cockney pronunciation approaches the American in this respect, as in the case of *corn,* which is pronounced, in the city, almost like *cawn.*

RABANUS, Maurus Magnentius, a learned German prelate, born in 785, at Mayence, received his first instruction at Fulda, and afterwards became the disciple of Alcuin, at Tours. In 822, he was made abbot of Fulda. In 829, the monks expelled him, alleging that, in consequence of his devoting so much time to his studies, the affairs of the monastery were neglected. They afterwards wished him to resume the government; but he declined, and remained in retirement until 847, when he was made bishop of Mayence. One of his first acts was to summon a council, in which he procured the condemnation of Godeschalc, for maintaining the doctrine of St Augustine respecting predestination and grace. Rabanus died in 856. He was a man of great learning, which he displayed in several treatises and commentaries, which were published in 1627, at Cologne, in 3 vols., folio.

RABAUT DE ST ETIENNE, John Paul, a French Protestant clergyman and advocate, was born in 1741, at Nismes, for which city he was chosen a deputy to the constituent assembly, in 1789. He had previously obtained some reputation by his writings; and possessing eloquence and address, he appeared with advantage as a public speaker. He distinguished himself, at first, as one of the warmest advocates for innovation; but on being elected a member of the national convention, his ardour in some degree subsided. He had the courage to speak against the right of the convention to sit in judgment on Louis XVI. His sentiments, and his connexions with the Girondists, proved his destruction. He was arrested, June 2, 1793, but made his escape, and was declared an outlaw on the 28th of July. He returned to Paris, and found an asylum in the house of his brother. Being discovered by accident, he was guillotined, December 5, 1793. He published several historical and political works, among which are *Lettres sur l'Histoire primitive de la Grèce* (1787), and *Précis de l'Histoire de la Révolution de France* (1791), new edition, with a life of the author, by Boissy d'Anglas (1822).

RABBANISTS, or **RABBINISTS**, also **TALMUDISTS**. See *Jews*, and *Talmud*.

RABBETING, in carpentry; the planing or cutting of channels or grooves in boards. In ship-carpentry, it signifies the letting in of the planks of the ship into the keel, which, in the rake and run of a ship, is hollowed away, that the planks may join the closer.

RABBI (Hebrew for *teacher, master*); a doctor of the Jewish law. *See the following article.*

RABBINICAL LANGUAGE AND LITERATURE. When the rabbis were driven by the Arabs from Babylon, at that time the head-quarters of Jewish erudition, and had established themselves in Europe, especially in Spain, and founded schools, they were soon incited, by the learned researches of the Arabs into the Arabic language, to examine their own language critically, which had degenerated from the old Hebrew to a corrupt Chaldaic dialect, and to bring it back to its original purity. They therefore endeavoured to make the biblical Hebrew a written language again, but were not able, either to separate all the Chaldaic forms from the grammar, or to confine themselves to the proper significations of the words, since they were not sufficient to express all the new ideas which had arisen. Thus there sprung up a new Hebrew written language, which was used by the rabbis in Spain, Portugal, Italy, and Germany, and was therefore called the *rabbinical language*. For the acquisition of this language, there have been grammars, and lexicons, &c., prepared by Cellarius, Reland, Hardt, Tychsen, Buxtorf, and others, and the labour of the study is repaid by the richness of the rabbinical literature, which may be learned particularly from the works of Buxtorf, Bartoloccius, and Wolf. Among the authors during the most flourishing period of the middle ages, Aben Ezra, David Kimchi (who died about 1232), but especially Elias Levita, are celebrated as grammarians; Nathan Ben Jechiel and David Kimchi also distinguish themselves, the one by a lexicon of the Talmud, in 1100, which was several times printed, and the other by a Hebrew lexicon, which long retained a classical reputation. The first, who, after the researches of Aben Ezra, Maimonides (born 1139; see *Maimon*), Solomon Jarchi, and David Kimchi, undertook a great critical revision of the Pentateuch, in which the Masora was his guide, was Meyer Hallevi (Haramah) of Toledo, in the beginning of the thirteenth century; the rabbi Menachem de Lonzano (whose *Or Torah*, with the *Shete Jadoth*, was published in Venice, 1618), succeeded, and after him came Solomon Norzi, whose labours surpass those of all the preceding, in extent and thoroughness. Among the commentators on the Old Testament, the most conspicuous are Aben Ezra, a learned philologist, but obscure writer; Solomon Jarchi, a poor linguist, and also obscure writer (about 1180); Joseph Kimchi (1160), one of the most learned of the Jews, and his son, David Kimchi, Levi Ben Gerson (before 1370) and Isaac Arbarbanel (before 1508). Maimonides endeavoured to aid the interpretation of the holy writings of his nation by philosophico-theological disquisitions; among the many commentators, he and Raschi were the most distinguished. The above-mentioned Levi Ben Gerson and Lipman of Mühlhausen (1399), wrote in defence of their faith. In respect to the geography of the middle ages, Moses Petachia of Ratisbon (before 1187), Benjamin of Tudela (in 1160), and Perizol of Avignon (about 1550), rendered much service by the descriptions of their travels. Mathematics, likewise astronomy, philosophy and medicine, were studied with great avidity by the Jews, especially in the schools of the Arabs in Spain; but as few of their scientific works are printed, we must be satisfied with referring to the oft-named Maimonides, who, as a philosopher, mingled the notions of Aristotle and Plato with the Cabala and the Talmud, but who, in his medical works (*Aphorismi*, and *De Regimine Sanitatis*), showed himself a follower of Galen.

RABBIT (*lepus cuniculus*). The rabbit differs from the hare in being of a smaller size, and having shorter ears and hinder legs. It is said to have been originally introduced from Spain into the various countries of Europe in which it is now found. In its wild state, the colour of its fur is brown; its tail black above, and white beneath; but when domesticated, the colours vary much, being white, pied, ash-coloured, black, &c. In England, rabbits are reared either in warrens or in hutches; the best situations for the former are sandy hills, on which the juniper is thickly planted, as the leaves of this shrub are eagerly eaten by rabbits, and impart a delicate and aromatic flavour to their flesh. If rabbits are kept in hutches, these places should be kept perfectly clean, or otherwise these animals will be sickly. They are extremely prolific, beginning to breed when about six months old, and producing young seven times a year, the litter usually consisting of eight. Should this happen regularly, the produce of one pair, in four years, would amount to the amazing number of 1,274,840. Rabbits are subject to two disorders, which often prove fatal to them,—the rot and a kind of madness. They are taken either by snaring them, or smoking them from their holes by the fumes of sulphur. Their fur is extremely useful in the manufacture of hats, and their flesh is more juicy than that of the hare. It is forbidden to be eaten by the laws of Moses and Mahomet.

RABELAIS, François, a humorous and satirical French writer, author of *Gargantua* and *Pantagruel*, was born at Chinon, in Touraine, about 1483. He was the son of an apothecary, or, according to some, of an inn-keeper. Rabelais entered the Franciscan order at Fontenay-le-Comte; but the absence of all true learning soon disgusted him with this residence, and his satirical humour and some youthful indiscretions drew upon him the hatred of the monks. With the permission of Clement VII., he now entered the Benedictine order (about 1523), but soon after went to Montpellier as a secular priest, and afterwards studied medicine, received the degree of doctor, and taught and practised the medical profession. Remorse or fear induced him to procure, from Paul III., absolution for the violation of his monastic vows, and he spent some time as canon in the abbey of Saint-Maur-des-Fosses, where he was placed by the interest of his patron, the cardinal du Bellay, and where he is supposed to have written a considerable part of his *Pantagruel*. He was afterwards transferred to Meudon, as parish priest. He died at Paris, in 1553. Voltaire censures the *Gargantua* and *Pantagruel*, in which the taste of the age for the wonderful and the ignorance of the monks are severely satirized; but the buffoonery which it contains must be attributed to the spirit of the age, and not to the taste of Rabelais, who is, however, much below Cervantes in humour. He was one of the first to give flexibility and finish to the yet rude and harsh language of his country. Boileau calls him *la raison en masque*, and Rousseau, *le gentil maitre François*. Rabelais was a conscientious teacher of his people, and it was his pleasure to instruct the children of his parish in sacred music. His house was the resort of the learned; his purse was always open to the needy; and his medical skill was employed in the service of his parish. His work cannot now be easily understood without glossaries and commentaries, the best of which is in the edition of Le Duchat, with engravings by Picart.

RABENER, Gottlieb William, a German satirist, was born in 1714, near Leipsic, and was controller of the taxes for the circle of Leipsic, until his death, in 1771. His works were republished several times; latest edition, Leipsic, 1771 (6 vols.) His life, by Weisse, appeared in 1772. He never allowed himself to indulge in personalities, but chastised folly in general. His satire would be considered rather tame in England, where the party contentions incident to a free government give rise to violent abuse and biting ridicule unheard of in arbitrary governments. His works have been translated into French and Dutch. A report of his death became current long before his actual decease; so that he had the pleasure of learning what people said about him.

RACCOON (*procyon*). This animal is found in most parts of the American continent, though it appears to be more common to the north than to the south. Its colour is grayish-brown, with a dusky line running from the top of the head down the middle of the face, ending below the eyes. The tail is very thickly covered with hair, and is marked by five or six annulations of black, on a yellowish-white ground. There are, however, several varieties as regards colour. The size varies much according to the age and sex. A full-grown male may be stated to have the body about eighteen to twenty inches long, the head five inches, and the tail about eight inches in length. The female exceeds these dimensions; and, among the skins in the furriers' shops, some are found which much surpass the above measurements. In the wild state, the raccoon is savage and sanguinary, committing great slaughter among both wild and domesticated birds, as he always destroys a great number without consuming any part of them except the head, or the blood which flows from their wounds. The raccoon also will occasionally commit ravages in plantations of sugar-cane, or of Indian corn, especially while the latter is in a young state. This animal is a good climber, and, from the form of its claws, is enabled to adhere so firmly to a branch of a tree, that it requires no slight exertion of strength to disengage it. One of the most marked peculiarities of the raccoon, and on which its specific name of *lotor*, or the washer, is founded, is its habit of plunging its food into water before eating it. It is tamed without much difficulty while young, but is apt to become untractable and dangerous as it grows older. In the domesticated state, it is extremely restless and inquisitive, examining every thing; is extremely fond of sweet things, and will even partake of strong liquors, so as to become intoxicated; delights in hunting spiders, grasshoppers, snails and worms. Captivity, however, produces considerable changes in the habits of this animal; for, instead, as in a state of nature, of sleeping during the day and roaming about at night in search of food, it will learn to be active during the day, and to remain quiet at night. When inclined to sleep, it rolls itself up into a kind of ball: in this posture, it sleeps so profoundly as not to be readily disturbed. The fur is valuable, and forms no inconsiderable article of traffic. Its principal use is in the manufacture of hats. The female has from two to three young at a birth. Her den is usually in some hollow tree, or very secure situation.

RACEME, in botany; a particular arrangement of flowers, when they are arranged around a filiform simple axis, each particular flower being stalked.

RACES. Horse races were customary in England in very early times. Fitz Stephen mentions them in the reign of Henry II. In the reign of queen Elizabeth, they appear to have been carried to such excess as to have injured the fortunes of the nobility. At that time, however, the matches were private, and gentlemen rode their own horses. In the reign of James I., public races were established. The horses were at that time prepared for running by the discipline of food, physic, airing, sweats, and clothing which compose the present system. The weight, also, which each horse was to carry, was rigidly adjusted. The usual weight was ten stone, and the riders were weighed before they started. The prize was generally a bell. About the latter end of the reign of Charles I., races were performed in Hyde park. After the restoration, racing was much encouraged by Charles II., and a silver bowl or cup of the value of a hundred guineas was allotted for a prize. Subsequent sovereigns have also encouraged racing. The sum of a hundred guineas is now given in lieu of the silver bowl. Fine and delicate horses, the natives of warm climates, excel in swiftness. The most perfect of these were originally found in Arabia; but their qualities may be improved in their descendants in a more fruitful country. The Arabs tried in England have never proved themselves equal in any respect, upon the course, to the English racers, descended from Arabian stock. The true test of thorough blood is not speed, but continuance. The speed and continuance of race horses is necessarily affected by the weight which they carry. It is said that, in running four miles, seven pounds make the difference of a distance, or 240 yards between horses of equal goodness. Weight is therefore regulated with scientific precision on the turf; and if the jockeys, or either of them, fall below the amount agreed upon, they are made to carry weights to make up the difference. The weights borne by race horses vary from the maximum twelve stone to a boy of the lightest weight. The usual trial of speed, in English racing, is a single mile; of continuance or bottom, four miles. It has been asserted that Flying Childers ran a mile over Newmarket in the space of a minute. The time was really a few seconds over a minute. Flying Childers, in 1721, ran four miles, carrying nine stone two pounds, in the space of six minutes forty-eight seconds. This wonderful animal leaped ten yards with his rider upon level ground, and is supposed to have covered, at every spring in running, a space of twenty-five feet, which is more than forty-nine feet in a second. Eclipse ran four miles in York in eight minutes, carrying a weight of twelve stone, or 168 pounds. Bay Malton ran over the same course in seven minutes and forty-three and a half-seconds. The present system of training race horses is to commence operations at four o'clock in the morning, by brushing the horse over. This being done, and the horse having finished his corn, he is taken to exercise: he takes his walking and galloping before and after water, according to his age, state of his flesh, &c. When he returns to the stable, whisping, leg-brushing, &c., ensue; afterwards feeding; and the door is closed, the horse being left to himself, free from all kinds of disturbance. This is finished as early in the day as possible. A similar process, but shorter, takes place three hours afterwards; at noon, brushing, feeding, &c., again, and the stable door is again closed for several hours, when similar operations to those of the morning are repeated; similar stable discipline follows, and the door is once more closed at six o'clock. At eight, the horses are fed and racked up. Their stables are often warmed by artificial heat. The administration of physic ought to depend upon circumstances. Immediately before the race commences, the jockeys are weighed, to see whether they are of the prescribed weight; and, immediately after the race is over, the weighing is repeated, to ascertain whether any of the weights have been dropped on the course. There is a great deal of fraud practised in the whole business of racing. The following are some of the laws observed on the turf. Horses take their ages from May day; that is, from the first day of the May next succeeding their birth. The term *catch weights* means that the riders are appointed by the parties without weighing. *Give-and-take* plates are twelve hands to carry a stated weight, all above to carry extra in the proportion of seven pounds for an inch. A *post match* is to insert the age of the horse in the articles, and to run any horse of that age, without declaring what horse, till you come to the post to start. The horse that has his head at the ending post first, wins the heat. If a rider fall from his horse, the horse may be ridden in by a person that is sufficient weight, provided he go back to the place where the rider fell. Horses running on the wrong side of the post, and not turning back, are distanced; horses are distanced, if their riders cross and jostle, when the articles do not permit it. When three horses have each won a heat, they only must start for a fourth, and the preference between them will be determined by the event.

RACES OF MEN. See *Man*.

RACINE, Jean. This great French tragic poet, born Dec. 21, 1639, at Ferté-Milon, lost his parents when a child, and was educated in the abbey of Port-Royal-des-Champs. Here the future direction of his tastes was already indicated in his love for the old Greek dramatic poets, among whom Euripides was his favourite. From Port-Royal Racine went to the college of Harcourt, where he completed his studies. His first production was an ode on the marriage of Louis XIV., which procured him, through Colbert's mediation, a pension, afterwards increased to 2000 livres, and a present of 100 louis-d'ors. From this time, he continued to reside at Paris, on terms of friendship with Boileau, and devoted entirely to poetry. His first tragedy—*La Thébaïde, ou les Frères Ennemis*—appeared in 1664, and, although much inferior to his later works, was received with great favour. In this piece, he imitated Corneille; in his later ones, he followed a more independent course. His *Alexandre* (1666), though not approved by Corneille, was received with almost universal applause in Paris; and his *Andromache* (1668), was still more successful. Through all the faults of the latter production, the power of the poet is perceptible; and, from this time forward Racine was generally preferred by his countrymen to Corneille, whom they had previously looked upon as inimitable. The ease and harmony of his versification, and his delineations of tender love, contributed mainly to this result. Racine replied to the tasteless criticisms of marshal Créqui and the count d'Olone by an epigram; but he had a more difficult struggle to sustain with St. Evremont, who was a sort of *arbiter elegantiarum* in France at that time. In 1638 appeared Racine's comedy *Les Plaideurs*, an imitation of the Wasps of Aristophanes, which makes us wish that its author had done more in that department. Historical truth is most accurately preserved in his *Britannicus* (1670). *Berenice* (1671), and *Bajazet* (1672), were the least successful of his pieces, and the least faithful in their historical colouring. *Mithridates* (1673) contains single scenes and situations of great merit. *Phèdre* (1677), and *Iphigénie*, which appeared two years earlier, are among the masterpieces of the French stage. In *Athalie* (1691), which at first was looked upon in France as an entire failure, Racine displays the whole compass of his genius. In 1673, he was received into the academy, and, several years later, was invited by Louis XIV. to write, in connexion with Boileau, a history of his reign, and was named royal historiographer; but he did not proceed far in this work. After a mistaken piety had withdrawn the poet from the theatre, he wrote *Esther*, at the request of Madame de Maintenon. It was received by the court, now sunk into an abject superstition, with the greatest applause, having been represented by the pupils at St Cyr, in 1689. Racine had hitherto enjoyed the favour of the court; but, having fallen into disgrace with the king, he died of chagrin, April 22, 1699. The cause of his disgrace was a treatise upon the sufferings of the people in consequence of the prodigality of the government, written by the direction of Madame de Maintenon, and which offended a monarch who was accustomed only to flattery. An edition of his works by Boisgermain appeared in 1767, and a more complete one by Lenormand in 1808. In forming an estimate of Racine's genius, we must distinguish the faults of his situation from those of the writer. (See *France, Literature of*, division *Dramatic Poetry*.) A certain stiffness and coldness; subjects drawn from Grecian and Roman antiquity, and treated with the French gallantry and polish; a strict adherence to rules, which forbids all lyric freedom or even romantic colouring; and the faults which arise from these circumstances, instead of detracting from Racine's merit, tend to elevate our opinion of him. He availed himself, with great skill, of all the means afforded by the narrow field which was left open for a French tragic poet, to elevate the tone of feeling and the action. His tenderness in the delineation of the passion of love is unsurpassed, and none, before or since, has better depicted the conflict of contending passions. In harmony of versification and grace of expression he is inimitable.

RACK. See *Arack* and *Torture*.

RADCLIFFE, Ann, an eminent novelist, was born in London, in 1764. Her maiden name was Ward, and, at the age of twenty-three, she was married to William Radcliffe, proprietor and editor of the English Chronicle. Mrs Radcliffe's first performance was a romance, entitled the castles of Athlen and Dumblaine, and the next the Sicilian Romance; but the first of her works that attracted much attention was the Romance of the Forest, which was followed by the Mysteries of Udolpho, which placed her at the head of a department of fiction then rising into esteem. Her last work of this kind was the Italian. She also published a volume of Travels through Holland and along the Rhine, in 1793. Mrs Radcliffe possessed the art of exciting a high degree of interest in her narrative: her descriptive powers were of a superior order, especially in the delineation of scenes of terror, and in those aspects of nature which suggest tender or melancholy associations. She died in London, in 1823. (See Scott's *Lives of the Novelists*.)

RADCLIFFE, John, a celebrated medical practitioner, born in 1650, at Wakefield, in Yorkshire, where his father possessed a moderate estate, was educated at Oxford. He became doctor of physic in 1682, and removed to London in 1684. He soon acquired great reputation, to which his conversational powers contributed; for, having a ready wit and a strong tincture of pleasantry, he was a very diverting companion. In 1686, he was appointed physician to the princess Anne of Denmark; and, after the revolution, he was often consulted by king William III., whose favour he lost in consequence of the freedom of speech in which he indulged himself. In 1699, the king, on his return from Holland, finding himself very unwell, sent for doctor Radcliffe, and showing him his ankles, swollen and œdematous, while his body was much emaciated, said, "What do you think of these?" "Why, truly," replied the physician, "I would not have your majesty's two legs for your three kingdoms." He was no more consulted by that prince; and, when Anne succeeded to the crown, lord Godolphin in vain endeavoured to get him reinstated in his post of chief physician, as he had given her offence by telling her that her ailments were nothing but the vapours. But, though deprived of office, he was consulted in all cases of emergency, and received a large sum of secret service money for his prescriptions. He died Nov. 1, 1714. Doctor Radcliffe left £40,000 to the university of Oxford for the foundation of a public library of medical and philosophical sciences, which was erected.

RADISH (*raphanus sativus*); a well known esculent root, universally cultivated in temperate climates, and in daily use. Several varieties have been produced by long cultivation, differing in the form, size, and colour of the roots; either turbinate or round, spindle-shaped; annual or biennial; white, red, violet, or blackish externally, but always white within. The taste is more or less pungent in these different varieties; but they are good only when young, becoming hard, woody, and hollow, with age. The radish requires a deep, loose soil to attain perfection, and it may be produced successively throughout the year by sowing monthly. It is of easy culture, but, during extreme heats, frequent irrigation is necessary, which renders the roots more mild and tender. The seed will keep five or six years. The stem of the radish is herbaceous, upright, two or three feet high, and rough with short hairs. The leaves are alternate, the superior ones simple and sessile, the inferior lyrate, divided into oval or rounded lobes, toothed on the margin, with the terminal lobe much the largest. The flowers are white or purplish, disposed in terminal racemes. The pods are cylindrical, acuminated with the style, indehiscent, and swelling into knots, and contain rounded seeds. These seeds are oleaginous, and in one variety, lately introduced from China, the oil is extracted and used for culinary purposes. Radishes are antiscorbutic and stimulant, but are little employed in medicine. The plant was originally brought from China and Persia, but has been cultivated in Europe from time immemorial.—The wild radish, or charlock (*R. raphanistrum*), is a troublesome weed in grain fields. The flowers are yellow.

RADIUS, in geometry. See *Diameter*.

RADNOR, the name of a county in South Wales, thirty-one miles in length from east to west, and twenty-six from north to south. It is bounded on the north by the counties of Montgomery and Salop, on the east by Hereford, and on the south and west by Brecon and Cardiganshires. The surface is, for the most part, mountainous, and its aspect bleak and dreary. The south-eastern districts, however, are to be excepted from this general character, and even amidst the wildest regions many fertile and sheltered valleys are discovered. The county is almost embraced by rivers. The Wye separates Brecon and Hereford from Radnor, as the Teme does Shropshire. The southern districts are watered also by the rivers Arrow, Machawy, and Eddow. The central are fertilized by the streams of the Lug, the Cwmmarron; Clewedag, and Ithon; while the Elan, Infant Wye, and others, sufficiently supply the north. Wheat, barley, and oats, are grown in the eastern part of the county; and the appearance of the corn districts is comfortable and happy: but it is upon the care and breeding of sheep that the agriculturists' attention is principally bestowed, and the wool of Radnor has earned a deserved preference in the English market. The mineral wealth is as yet imperfectly ascertained. Lead has been found at Caer Elan; copper in the vicinity of Llandrindod Wells; and limestone underlays the surface very generally. The want of coal is much felt, as it is attended with a difficulty of obtaining lime, a serious loss in the tillage districts. The mineral springs of Llandrindod are visited annually by invalids. Radnor contains six hundreds, and fifty-two parishes, forty-seven of which are in the diocese of St David's, and five in that of Hereford. The principal towns are Presteigne (now the county town), Knighton, Rhayda, and New Radnor. Population of the county in 1821, 22,503; in 1831, 24,651.

RAEBURN, Sir Henry, a very eminent portrait painter, was born at Stockbridge, one of the suburbs of Edinburgh, on the 4th March, 1756. At the age of fifteen he was bound apprentice to a goldsmith in Edinburgh, and here he first amused himself with drawing miniatures, which were executed in such a superior manner as to excite the attention of his friends, and latterly, to come into great general demand. On the expiration of his apprenticeship, he became professionally a portrait painter; and with the view of improving in his art, he repaired to London, and introduced himself and his works to the notice of Sir Joshua Reynolds. That artist recommended a residence in Italy, in obedience to which advice Mr Raeburn set out for Rome, with introductory letters from Sir Joshua, to the most eminent men of science there. After spending two years in Italy, diligently engaged in studying those great works of art with which that country abounds, he returned in 1787, and established himself in Edinburgh. Here he soon rose to the head of his profession in Scotland, an eminence which no artist presumed to dispute with him during the remainder of his life. In 1795, he built a large house in York Place, the upper part of which he lighted from the roof, and fitted up as an extensive gallery, while the rest of the house was laid out in convenient painting rooms. His dwelling-house was at St. Bernard's, near Stockbridge, on the banks of the Water of Leith. The future history of Mr Raeburn's life is limited to that of the paintings which he executed. He painted portraits of most of the celebrated individuals by whom Scotland has been illustrated during the last forty years. His likenesses are universally regarded as most striking ones, while they are executed with a freedom, vigour, and dignity of style peculiarly his own. His equestrian figures, in particular, obtained for him a high degree of reputation. His principal portraits of this kind are those of his own son upon a pony, of Sir David Baird, of the Duke of Hamilton, of the Earl of Hopeton, and of Lord Kintore's gamekeeper. Among his full length portraits may be enumerated those of Sir Walter Scott, Mr Keith of Ravelstone, Mr Dugald Stewart, Professor Playfair, Francis Horner, M.P., Lord Frederick Campbell, Glengarry, Macnab, Macdonald of St. Martin's, Sir John Hay, Lord Glenlee, Lord Douglas, Dr Hope, Sir John Douglas, &c. Among his pictures of a smaller size which have been admired are those of Lady Cuming Gordon, Mr and Mrs Skene of Rubislaw, Mrs Hay, Mr Thomas Thomson, Mr John Murray, the celebrated James Watt, and Dr Marcet. The most interesting, however, of his later works are a series of half-length portraits of his literary and scientific friends, which he painted solely for his own private gratification. Among these are the portraits of Sir Walter Scott, Lord Jeffray, Francis Horner, Rev. Archibald Alison, Sir David Brewster, Rev. Andrew Thomson, Mr John Rennie, Lord Cockburn, Rev. J. Thomson, and Mr H. W. Williams. In 1822, when King George IV. visited Scotland, the dignity of knighthood was, without any solicitation, conferred on Mr Raeburn, and he afterwards received the appointment of portrait painter to his Majesty for Scotland. He did not survive those honours long, as he died, after a short illness, on the 8th July, 1823. At a meeting of the Royal Academy of London, on the 16th of that month, Sir Thomas Lawrence lamented the melancholy task which had devolved upon him, of announcing officially to his colleagues, the death of one of their most distinguished associates. He expressed his high admiration for the talents of the deceased, and his unfeigned respect for the high feeling and gentlemanlike conduct which had conferred a dignity on himself, and on the art which he professed. His loss, Sir Thomas said, had left a blank in the Royal Academy, as well as in his own country, which could not be filled up.

RAFELLO. See *Raphael.*

RAFFLE; a game of chance, in which several persons deposit each part of the value of a thing for the chance of gaining it. The winner takes the whole.

RAFFLES, Sir Thomas Stamford, the son of a captain in the West India trade, was born at sea, off Jamaica, in 1781. His father placed him for education at Hammersmith, where he remained till he was appointed to a clerkship in the India house. In 1805, the secretary to the board procured him the situation of assistant-secretary to the new government of the Prince of Wales's island, and he was soon after appointed Malay translator to the government. In 1810, his reputation procured him the appointment of agent of the governor-general with the Malay states; and the following year, on the reduction of Java, he was nominated lieutenant-governor of the island. In this capacity he continued till 1816, when he returned to England, with an extensive collection of the productions, costume, &c. of the Eastern archipelago. The year following appeared his History of Java, (new edition 1830.) In 1817 he was nominated to the residency of Bencoolen, in Sumatra, with the honour of knighthood, and the lieutenant-governorship of Fort Marlborough. Here he remedied many disgraceful abuses. In 1823, he laid the foundation of a literary institution, consisting of a college for the encouragement of Anglo-Chinese literature. In the following year he embarked for Europe; but, a fire breaking out in the ship, the vessel was destroyed at sea, the crew and passengers saving their lives with difficulty in the boats, and relanding in a state of utter destitution, about fifteen miles from Bencoolen, after passing a night on the ocean. He embarked again for London in the same year, and died in 1826. In 1830 appeared a Memoir of his Life by his Widow, (4to.)

RAFFLESIA. This gigantic flower was discovered not many years since in the interior of Sumatra. It is very rare there, and is parasitical, growing on the *cissus angustifolius*. The whole plant seems to consist of little else beyond the flower and root. It is diœcius and the female flowers are unknown. The calyx, or corolla, consists of a ventricose tube crowned with a ring, and divided at the summit into five equal lobes. The stamens are very numerous. The stem, which hardly rises above the root, is fleshy, and covered with very large obtuse, imbricated bracts. The diameter of the flower is three feet, and some parts of the calyx or corolla are three-fourths of an inch in thickness. No other flower in the vegetable world at all approaches these dimensions. The *R. horsfieldii* is a second species of the genus, with a much smaller flower.

RAFT; a sort of float, formed by a body of planks or pieces of timber fastened together side by side, so as to be conveyed down rivers, across harbours, &c., more commodiously than if they were separated.

RAFTERS, in building, are pieces of timber, which, standing by pairs on the raising piece, meet in an angle at the top, and form the roof of a building.

RAGOTSKI, Francis, second of the name, prince of Transylvania, was born in 1676. On the death of his father he was carefully watched by the house of Austria; but he secretly entered into a negociation with Louis XIV., which being betrayed, he was found guilty of high treason. Having made his escape from prison, and received assurances of succour from France, he entered Hungary, and published a manifesto, urging the people to free themselves from the tyranny of the Austrians. He was joined by a great number, and stormed some fortresses, taking a severe revenge upon the imperialists, who had given no quarter to the Hungarian insurgents. In 1704 he was proclaimed prince of Transylvania and protector of Hungary. He soon, however, felt the difficulty of opposing the arms and policy of a powerful sovereign, especially as Louis could not render him much assistance. He also found a rival in his friend and associate, count Bercheni; and in consequence of a severe check, his troops began to desert. In 1711, a treaty was concluded between the Hungarian states and the emperor, to which he refused to accede, though the first article secured his life and property, with the title of *prince of Transylvania*. Deeply wounded at this defeat of his patriotic wishes, he withdrew into Turkey, where he died in 1735. He wrote Memoirs of his Life, published in the *Révolutions de Hongrie*, (Hague, 1739.) There is also a publication, but of very doubtful authenticity, entitled *Testament Politique et Moral du Prince Ragotski*.

RAGS. See *Paper*.

RAGUSA; capital of a circle of the same name in Dalmatia, (q. v.,) lying on the Adriatic, in lat. 42° 36′ N.; lon. 18° 11′ E.; population 6500. It was formerly a republic, with a territory of 500 square miles, and 60,000 inhabitants, which was founded in 656. Its most flourishing period was from 1427 to 1440, and it preserved its liberty by the payment of a tribute to the Porte. In 1806, although the republic observed the strictest neutrality, it was taken possession of by the French, and, in 1811, was incorporated with the government of Illyria. In 1814, it was occupied by Austrian troops. Napoleon conferred the title of "duke of Ragusa" on marshal Marmont.

RAGUSA, DUKE OF. See *Marmont*.

RAIK. See *Caliph*.

RAIKES, ROBERT, a printer and philanthropist, was born at Gloucester, in 1735. His father was proprietor of the Gloucester Journal, and the son succeeded him in the printing business; and having realized a good property, he employed it with his pen and his influence in relieving such objects as stood in need of his benevolent assistance. He is, however, best known for his institution of Sunday schools, which he planned, conjointly with the reverend Mr Stock, in 1781. Mr Raikes died at Gloucester in 1811.

RAILWAYS, roads made by placing lines of smooth and parallel bars between one place and another, in order to increase the speed of the transport of carriages, by diminishing the resistance to the rolling of the wheels. The most perfect of the Roman roads, as the Appian way, which is a continued plane surface formed by blocks of stone closely fitted together, was a near approach to the modern railroad; but the plans of the two species of road are very different. The first railways, formed on the plan of making a distinct surface and tract for the wheels, seem to have been constructed near Newcastle upon Tyne. In Roger North's Life of Lord Keeper North, he says, that at this place, (in 1676) the coals were conveyed from the mines to the banks of the river, "by laying rails of timber exactly straight and parallel; and bulky carts were made with four rollers fitting those rails, whereby the carriage was made so easy that one horse would draw four or five chaldrons of coal." One hundred years afterwards, viz. about 1776, Mr Carr constructed an iron railroad at the Sheffield colliery. The rails were supported by wooden sleepers, to which they were nailed. In 1797, Mr Barns adopted stone supports in a railroad leading from the Lawson main colliery to the Tyne near to Newcastle; and, in 1800, Mr Outram made use of them in a railroad at Little Eaton, in Derbyshire. Twenty-five years afterward, this species of road was successfully adopted on a public thoroughfare for the transportation of merchandise and passengers, via the Stockton and Darlington railroad, which was completed in 1825, and was the first on which this experiment was made with success. From that time, accordingly, a new era commenced in the history of inland transportation.

The species of rail first employed was a broad surface of cast iron, sufficient to support the rim of a common cart or carriage, these are called plate or *tram* rails, and such rails are very useful, where the carriages that pass over them have occasionally to traverse common roads. But another species of rail is now universally employed, where the carriages have to pass only over the railway, these are called *edge* rails, and are distinguished from the former by being much narrower on the upper surface. On the edge railway very narrow wheels are used on the carriages, the breadth of the rail not in general exceeding two inches, and the carriage is kept in the way by means of flanges on the outer part of the rim of the wheel. These flanges ought never to touch the rail on account of the great resistance they cause, and a better plan is now adopted in forming the carriage wheels bevelled on the rim, so that the exterior diameter is less than the interior. The form of the edge rail will be seen by inspecting our plate of Locomotive Engines. (See *Locomotive Engines*.) The rails are fashioned in bars commonly three feet in length, fastened at each end upon the sleepers. The usual form of such is as we have shewn them in our plates of the Locomotive Engine, of the fish-bellied shape, thicker in the middle than at the ends, but although theoretically this may appear the best fitted for the purpose, recent experience has shewn that a straight rail is equally strong, and has the great advantage, that the cast is much less, from the greater ease in making. Cast iron rails are at first much cheaper than malleable iron ones, but the following statement will show that the latter are in reality, by much the more economical:—

"Malleable iron rails, 15 feet long, over which locomotive engines pass, weighing from 8 to 11 tons, wagons and their loads 4 tons each; 86,000 tons passed over in a year, exclusive of engine and wagons; weight of rail, 1 cwt. 24½ lbs. Loss of weight in twelve months, 8 oz.—Cast iron rails 4 feet long, over which wagons only pass, weighing 4 tons each when loaded: 86,000 tons passed over in a year, exclusive of wagons; weight of rail [illegible] lbs. Loss of weight in twelve months, 8 oz., being, with less traffic, as great a loss upon 4 feet as upon 15 feet of wrought iron rails."

Not only are malleable rails more durable than those made of cast iron, but malleable rails when in use are less susceptible to the deteriorating action of the atmosphere than the same rails would be if unused; for if a bar of wrought iron be placed upon the ground, alongside one of the same form and material in the railway in use, the former is continually throwing off scales of rust, while the latter continues almost wholly free from waste of that description, a fact discovered by Mr Stephenson, to depend on certain electric influences communicated by the passage of the trains. The strength of iron necessary for the construction of a permanent railway, is a matter which can be decided only by experience. Unless the railroad be supported equally throughout its entire length, each rail must be subject to some amount of deflection when great weights are passing over it, and the extent of deflection is in some measure dependent also upon the speed, and in the opinion of Professor Barlow, the additional resistance to the carriages, caused by the deflection of the bar, will be equivalent to the carriage being carried up a plane of half the whole length, the other half being horizontal. The rails first employed on the Liverpool and Manchester railway weighed no more than 35 lbs. per yard, but were soon found to be inadequate to the purpose. In the report of the directors of the Railway Company, made in January, 1834, they state, that "in particular parts of the road, especially on the descending lines of the inclined planes, the rails prove too weak for the heavy engines, and the great speed at which they are moved; and from the breakages which have taken place, the directors have thought it expedient to order a supply of stronger and heavier rails to be put down in those districts where the present rails have been found insufficient." In their report of July, 1835, they state that: "With the plan recommended by the directors, at the last half-yearly meeting, of relaying, from time to time, certain portions of the road with heavier and stronger rails, the directors have every reason to be satisfied. A portion of the way has been recently laid with parallel rails, 60 lbs. to the yard; and when, in addition to the greater security afforded to the general traffic by a firm and substantial rail, account is taken of the diminished charge at which the road, when so laid, will be kept in order, the directors feel confident the proprietors will approve of their persevering in the plan which they have thus commenced." In the report, 27th July, 1836, they remark, "The proprietors are aware that portions of the old and comparatively weak rails have been gradually replaced with stronger bars. From the near approach of the period when the Grand Junction and the North Union Railways may be expected to bring additional traffic on the Liverpool and Manchester line, the directors have determined, with the concurrence of the proprietors, to relay the whole way more rapidly than they originally contemplated. In conformity with the contracts already made, about one half the whole line will be laid with new rails by the end of the present year. The great advance in the price of iron will render the relaying of the way a more costly work than was at first anticipated; but this is only one instance out of many in which the Liverpool and Manchester company have been constrained to purchase experience at a very dear rate—dear, at least if regarded in reference to their individual and pecuniary interests; but cheap, if the proprietors, taking a more enlarged view of the great subject of railways, will include in their consideration the beneficial results, vast and undisputed, which will shortly be realised by the country and the world." Mr Brunnell the engineer of the Great Western Railway, has suggested that a greater space should be allowed between the rails than has been adopted on the Liverpool and Manchester, or London and Birmingham railways, and the carriages being hung between the wheels, the diameter of the wheels can be increased, and with it the speed of travelling.

Route. The first enquiry presenting itself in respect to a railroad between two points, relates to the choice of a route, where the nature of the territory permits of any such choice. In making this election, the comparative distances, the amount of intermediate transportation to be accommodated, the character of the soil as to affording a good foundation, the excavations and embankments necessary to be made in order to bring the road within a certain scale of inclination, and the difficulty or facility of obtaining suitable materials for the construction of the road, are all to be taken into consideration. These investigations and comparisons cannot be too rigidly and minutely made; and it has been suggested by experienced engineers, that in some of the roads of this description constructed in the U. States, great mistakes will be found to have been made in this respect, in consequence of too great precipitancy in fixing on a route.

Gradients or Inclination. The scale of inclination to which the road is to be reduced, is necessarily taken into consideration in fixing upon the general route; but still a choice often presents itself in parts of such routes, between the expense of reducing the rate of inclination, by excavations and embankments, and the saving of expense by taking a more circuitous route. Another question also presents itself, namely, whether to reduce an acclivity, or to surmount it; and the manner of overcoming it is a subject of inquiry at the same time; for, the surface of the ground having been examined and the route determined, on a general scale of inclination, within which the ordinary power used for transportation is to be applied, the whole line is either to be brought within this scale, or if an inclination exceeding it is admitted, it is to be overcome by the use of an extra power. In such case, if the extraordinary expense of reducing the inclination is not so great that the interest upon this part of the original outlay would exceed the additional expense of the use of an extra power to overcome an inclined plane, it will be a decisive reason in favour of reducing the inclination. The amount of transportation to be accommodated will determine, in a great degree, the expense of the extra power requisite to overcome a given inclined plane. Another circumstance to be considered is, whether the extra power to be used is that of horses, or steam, or water; for the two former are comparatively more expensive for a small than for a large amount of transportation, owing to the cost of maintaining them; but the difference is not so great where a water power can be used. In some cases it may be better to make deflections in the road, than to reduce inclinations, or to use extra power. This will depend on the kind of transportation and the importance of celerity; for if the object is mainly the transportation of increased weight by the same power, without regard to the time, any deviation from a direct course is less objectionable. But upon lines of public travel, dispatch is of great importance.

In the recently constructed railroads in England, the iron rails are in general supported by iron chairs or props, at a distance of about three feet from each other. Lately the rails are made in lengths of fifteen feet, so that two-thirds of the sleepers or bearings are saved. Where the rails rest on a line of wood, the track must be comparatively imperfect, since the wood will yield to the weight of the load transported, and be slightly compressed as the wheels pass, thus offering a continual resistance. Where successive parts of the track are formed by laying iron rails upon pine, oak, and stone, the difference of power necessary to move the same load on the different parts, will be evident in the different degrees of exertion made by the horse, where this power is used. Accordingly, if a soft species of wood is used to support the iron rail, it is of great advantage to interpose a line of oak or other hard wood. A rail continuously supported by a line of stone will not yield to the weight of the load; and where the rail is supported at successive points by chairs, it is always intended to be of such strength, that it will not be sensibly bent by the weight. Continued lines of granite or other durable stone, are now in use on a number of railroads in the United States of America, but cannot as yet be considered to be so thoroughly tested, though the results of the experiments are thus far very favourable. It was apprehended, at first, that the action of the wheel would draw or flatten the iron plate; but it has been found by experience, that this effect is not produced. The principal difficulty in the use of this kind of track, was in the fastening of the rail to the stone, the nails used for this purpose being liable to be loosened or cut off by the expansion and contraction of the iron rail. This defect has, however, been partially remedied by making oval holes in the rails for the fastenings, thus allowing a little longitudinal motion of the rail without injury to the fastenings. Cast iron rails do not so easily bend, and the same weight of iron is also much cheaper. But they are more subject to be broken by sudden jars and blows, and a much greater weight must be used in order to obtain the requisite strength. In the tram railways, plate rails are used, with a perpendicular plate or rim, at the outside edge of the rail, of two or three inches in height, to confine the wheels upon the railroad. In the mode of joining the rails, very important improvements have been made since the introduction of railroads into more general use. The rails were at first only about three or three and a half feet in length, and fastened in the chairs by a pin running horizontally through each end of the rail, there being two holes in each chair for the admission of two pins for this purpose, one for the end of each rail, so that the fastenings were distinct. The consequence was, that if the chair did not stand upon a perfectly firm foundation, but upon one that yielded on one side, so that the chair leaned in the line of the road, one of the pins, and consequently the end of the rail fastened by it, would be depressed below the other, thus making a sudden break in the surface of the track, which would cause a jolt as the wheel passed over it, to the injury of both the road and the carriages, and the inconvenience of passengers. Mr Wood says this defect was very frequent on rail-roads constructed upon this plan. It has been remedied by making the rails join by lapping with what is called the *half-lap*, and fastening the ends of both rails by one pin; so that, although a chair should lean in the line of the road, or be a little depressed below the others, still the two rails would present a smooth surface at their junction. The injury and inconvenience occasioned by the imperfections of the junctions of the rails were still further remedied by making the rails twelve or fifteen feet in length, supported at short distances as before, the form and dimensions of each part of the rail between any two supports being constructed as already described; by which means the number of junctions was reduced to one fourth or fifth of their former number. This was a very great step in the improvement of this species of road. An improvement, of great utility, has also been made in the mode of fastening the rails, by dispensing with the use of pins, which were liable to work loose. There are various forms of constructing the rails and chairs for this purpose, but they all agree in principle. One mode is by making a depression in the chair on one side of the rail, into which a projection from its lower side precisely fits. If the rail is held close upon that side, it is thereby fixed to the chair, and can be moved only with the chair itself; and it is so held by driving a key or wedge along the opposite side of the rail, between the rail and the side of the chair projecting upon the side of the rail.

Chairs. Fastenings. In describing the rails the supports or chairs have been partly described. They are of iron, with a broad, flat base, supported upon blocks of stone, into which holes are drilled, and filled with wooden plugs. The chairs are fastened to the stone blocks by nails driven into these plugs. This stone block should rest firmly upon its base, and not be liable to change of position by frost or any other cause; and, accordingly, great care has been taken to make these supports firm.

Turn-outs. If all the wagons upon a rail-road whether for the transportation of passengers or merchandise, were to travel at the same time, and at the same speed, two sets of tracts would be sufficient to accommodate the whole, as there would be no necessity of their turning out to pass each other. But in the transportation of passengers, greater speed is desirable than in the transportation of merchandise; for the transportation of merchandise, whether by horse power or steam power, can be done more economically, and with less injury to the road, at a low than a very high rate of speed. It is, therefore, a very considerable object, in rail-roads upon lines of public travel, to allow wagons to pass others travelling in the same direction. Provision must be made, accordingly, for turning out. This provision is particularly necessary in case of a road with a single set of tracks, on which the carriages must meet. These turn-outs are made by means of a movable or switch rail at the angle where the turn-out track branches from the main one. This rail is two or three feet, more or less, in length, and one end may be moved over that angle, and laid so as to form a part of the main track, or the turn-out track. The switch rail is usually moved by the hand, so as to form a part of that track on which the wagon is to move.

Carriages. Wheels. The bodies of the wagons will, obviously, require to be constructed with reference to the kind of transportation. The principal consideration, in regard to the construction of the carriages, relates to their bearings on the axle and the rim of the wheel. The rule given by Mr Wood, as to the bearing on the axle, is, that in order to produce the least friction, the breadth of the bearing should be equal to the diameter of the axle at the place of bearing. This diameter must be determined by the weight to be carried; and the breadth of the bearing will accordingly vary with it. The objection to the plate rail, as already stated, is, that the breadth of the bearing of the rim of the wheel upon such a rail, causes an unnecessary additional friction; and the resistance to the wheel is increased in consequence of the greater liability of such a rail to collect dust and other impediments upon its surface. The edge rail is preferable, in these respects; but, at first, these rails were liable to one difficulty, in consequence of their wearing grooves in the rim of the wheel, so that the friction was continually increasing, and the wheel soon became unfit for use. To remedy this defect, the rims were case-hardened, or chilled, by rolling them, when hot, against a cold iron cylinder. Wheels so case-hardened, are found to be subject to very little wear. It was, at first, objected to the use of iron wheels, that they would not take sufficiently strong hold of the rails to draw any considerable load after them, and that therefore they would not answer for the use of locomotive engines. Where horses are the motive power, it is evident that if the horse draws the car to which he is attached, the others fastened to it must follow, it being no objection that either the wheels of the carriage to which the horse is harnessed, or of those of the train following, do not take hold of the rails, but, on the contrary, the less hold they take, the more easy it will be to move the train. But where one carriage is impelled forward by the action of the engine in turning the wheels, and the following train of wagons is drawn by the engine car, if the resistance by gravity and friction is greater than the force with which the wheels adhere to the rails, the engine will only revolve the wheels to which it is geared, which would turn upon the rails, and the car and whole train remain stationary. To prevent this, different contrivances were heretofore resorted to, one of which was to let teeth project from the sides of the wheels to interlock with rack-work on the side of the rail. It has, however, been found, in practice, that, for the ordinary inclinations of railroads, to the extent of about thirty feet per mile, the wheels may be so constructed as to move a train of wagons by their mere adhesion to the rails. The inclination which can be so overcome must evidently depend on the kind of surfaces of the rim of the wheel and the rail, the weight bearing upon the wheels, the weight to be moved, and the resistance from the friction of the train of wagons; so that no precise rule can be given that shall be applicable to roads and wheels of different materials and construction. One of the first expedients for increasing the adhesion of the wheels to the rails, without incurring any considerable loss by additional weight or friction, was to gear the four wheels of the engine car together, so as to have the advantage of the friction of all of them upon the rails; for, if the piston of the engine is connected by gearing only with the wheels of one axle, a resistance in the other wheels of the engine, and by the whole train, only equal to the friction of those two wheels, can be overcome. By gearing the piston of the engine with the four wheels, by means of an endless chain passing round the two axles upon two cog-wheels, or by otherwise gearing the four wheels together or to the piston, the hold of the wheels on the rails is doubled. For the same purpose, an additional set of wheels, making six in the whole, for the engine car, is sometimes added; but such an addition to the number of sets of wheels is evidently attended with disadvantages on the score of expense, complication of structure, weight to be moved, and friction of parts to be overcome. The advantage proposed by adding another set of wheels is, that a greater weight may be carried by the engine car, thus making a greater adhesion to the rails by the wheels geared together, without throwing so great a weight upon any of the wheels as to injure the road. But resort is rarely had to this expedient. An improvement, having the same object, and attended by no loss from addition of weight or friction, is a contrivance for securing the adhesion of all the wheels to the rails; for it will be obvious that, if the two axles of the two sets of wheels are fastened to a strong unyielding car frame, the car will rest upon three wheels, whenever the surface of the road does not precisely correspond in relative altitude to the lower points in the rims of the wheels; that is, if the surfaces of the rails are precisely in the same plane, and the bearing surfaces of the rims of the wheels are also precisely in the same plane, all the wheels will rest upon and take hold of the rails, whether the axles are fastened to an unyielding frame or not. But no road or carriage can be so perfectly constructed, that the surfaces of the rails and bearings of the wheels can always exactly correspond. Mr Knight, the chief engineer of the Baltimore and Ohio railroad, says, in his report of October, 1831, that the whole weight of a wagon, with an unyielding frame, will frequently be supported on two only of the four wheels, thus making a load bear twice as much upon one part of the rail, as it would do if its weight were equally supported by the four wheels. To remedy this difficulty, the whole weight carried upon the axles is supported by springs, or some interposed elastic power, that of the condensed steam being taken advantage of for the purpose in some cars, whereby each wheel is pressed upon the rail, though the relative surfaces on which the wheels may bear, on different places in the road, may vary. Mr Knight, in the same report, makes a suggestion worthy of consideration in the construction of wagons, as well as engine cars. He proposes that in all cases the weight should be supported on springs, not only for the purpose of distributing the weight equally, but also to prevent shocks and jars, whereby both the road and carriages are injured. Another expedient to secure a sufficient adhesion of the wheels to the surfaces of the rails, is to use wheels for the engine car that are not case-hardened.

The experiments stated by Mr Tredgold and Mr Wood show a very great advantage in the use of large wheels. Mr Wood states that the motive power required to overcome the same friction of rubbing parts of the car and engine, in case of wheels four feet in diameter, is less by one fourth than in case of those three feet in diameter. But there is some limit to the extent of this advantage; for an increase of the diameter of the wheel adds to the weight, and the expense of construction, so that wheels of not more than four or five feet in diameter are ordinarily used, and a great part of those in use are not above two and a half feet. Some of the locomotives used on the Liverpool and Manchester railroad have sets of wheels of different sizes, the diameter of one being nearly double that of the other. The state of the rail will have some effect upon the adhesion of the wheels, which is least when the rails are slightly wet. The experiments of Mr Booth, on the Liverpool and Manchester railroad, prove that in the most unfavourable state of the rails, the adhesion of wheels of malleable iron upon rails of the same material, is equal to one twentieth of the weight upon them. The locomotives vary in weight, from three or four to ten or eleven tons. A locomotive, with its apparatus and appendages, weighing four and a half tons, will adhere to the rails with sufficient force to draw thirty tons weight on a level road, at the rate of fifteen miles per hour, and seven tons up an ascent of one in ninety-six, or fifty-five feet in a mile; at a slower rate, it will draw a greater weight. The slower the rate of travelling is, the greater is the weight that may be supported by the same wheel, without injury to the road from shocks, though the weight must of course be limited by the size and strength of the rails, whether the rate of motion be quick or slow.

Curvatures in the Road. The curvatures of the railroad present some obstructions, since, the axles of the car and wagons being usually fixed firmly to the frames, every bend of the tracks must evidently cause some lateral rubbing, or pressure of the wheels upon the rails, which will occasion an increased friction. If the wheels are fixed to the axles, so that both must revolve together, according to the mode of construction hitherto most usually adopted, in passing a curve, the wheel that moves on the outside or longest rail must be slided over whatever distance it exceeds the length of the other rail, in case both wheels roll on rims of the same diameter. This is an obstruction presented by almost every railroad, since it is rarely practicable to make such a road straight. The curvatures of some roads are of a radius of only 300, and even of 250 feet. The consequence was that the carriages heretofore in use were obstructed, not only by the rubbing of the surfaces of the wheels upon the rails, already mentioned, but also by the friction of the flange of the wheel against the side of the rail. This difficulty has, however, been in a great measure remedied by an improvement made in the form of the rim of the wheel. The part on which this rim ordinarily rolls on the rail, is made cylindrical, this being the form of bearing evidently the least injurious to the road, as the weight resting perpendicularly upon the rails has no tendency to displace them or their supports. But between this ordinary bearing and the flange, a distance of about one inch in a wheel of thirty inches diameter, the rim was made conical, rising towards the flange one sixth of an inch, and thus gradually increasing in diameter. Wherever the road bends, the wheel, rolling on the exterior, and, in such case longer track, will, in consequence of the tendency of the carriage to move in a right line, be carried up a little on the rail, so as to bear upon the conical part of the rim, which gives a bearing circumference of the wheel on that side, greater than that of the wheel at the opposite end of the same axle. The tendency, accordingly, is to keep the car in the centre of the tracks, by producing a curvilinear motion in the wagon, exactly corresponding to the curve of the road. In the report made by Mr Knight (of the United States of America), in 1830, he says that a car, with wheels such as those already described, was run upon a part of the Baltimore and Ohio railroad, where the greatest curvatures were of a radius of 400 feet, at the rate of fifteen miles per hour. In his report of October 1, 1831, Mr Knight says that the additional friction on such a curve, above that on a straight road, is 1 in 1418, equal to 3.72 feet in a mile, with Winans's car, and 1 in 356, equal to 14.83 feet in a mile, with another car. If the diameter of the wheel is increased, that of the conical part of the rim should be increased also, making the rise of the conical part between the flange and the cylindrical part (as Mr Knight estimates in his report of February 1, 1830), one fifth of an inch in a wheel of three feet diameter, and one fourth of an inch in a wheel of four feet diameter. In his report of October 1, 1831, he says he had changed the ratio of the conical part of the rim, on wheels of the same size, from that of one to six, to that of one to five, and had increased the length of the conical part to $1\frac{3}{16}$ inch: and that he thinks the form of the rim was thereby improved. In the same report, Mr Knight describes a method of turning a very short curve of a quadrant of a circle on a radius of sixty feet, by making a plate with a groove for the flange of the wheel on the longer track to run in; thus, in this case, making the difference of the rolling circumference of the wheels correspond to that of the two tracks. This plan was adopted for the purpose of turning corners of streets in towns, and, from experiments that have been made, promises to be successful.

Inclined Planes. Where the inclination of the road is greater than that for which the ordinary power is calculated, the ascent must be effected by means of an additional power, the amount of which can be readily computed, since, in those parts, no additional friction of the cars or wheels is to be provided for, and only the additional resistance arising from gravity is to be overcome. If, for instance, the additional inclination is one in ninety-six, or fifty-five feet in a mile, the additional power must be as the weight as one to ninety-six, or as fifty-five to the number of feet in a mile, namely, 5280. In descending planes, so much inclined that the gravity would move the carriages too rapidly for safety, the velocity is checked by means of a break, which consists of a piece of wood of the same curvature as the rim of a set of the wheels, upon which the break is pressed by means of a lever, so adjusted as to be within reach of the conductor, in his position on the carriage.

Power. Gravity, horse power, and steam power have been used on rail-roads. Where the road is sufficiently and uniformly descending in one direction, gravity may be relied upon as a motive power in that direction; but on rail-roads generally, some other power must be resorted to in each direction. At the time of the construction of the Liverpool and Manchester rail-way, much discussion took place, as to the expediency of using stationary or locomotive steam-engines. The result of the deliberations was, that if locomotives could be constructed within certain conditions as to weight and speed, they would be preferable. The directors accordingly offered a premium for the construction of such a locomotive, as should perform according to the conditions prescribed. At the celebrated trial on that road in October, 1829, of which Mr Wood gives a particular account in the edition of 1831 of his work on rail-roads, the locomotive, called the *Rocket*, constructed upon the plan of Mr Robert Stevenson, was found to come within the proposed conditions, and accordingly the decision, in respect to that road, was in favour of locomotives. The opinion in favour of this kind of power on roads of which the inclination does not exceed about thirty feet in a mile, has become pretty fully established. Stationary power can be used to advantage only on lines of very great transportation, as the expense is necessarily very great, and almost the same, whether the transportation be greater or less. Another objection to the use of stationary power is, that its interruption, in any part, breaks up the line for the time, which is not necessarily the case with a locomotive. The alternative, accordingly, is between the use of locomotive steam engines or horses, and the choice must be determined by the particular circumstances of the line of transportation. The advantages of this species of road are illustrated by the action of a horse upon it, compared with his performance upon the best turnpike, being, as Mr Wood assumes in one of his estimates, in the proportion of 7.5 to 1; thus enabling us to dispense with thirteen out of fifteen horses required for transportation on the best common roads. The horse's power of draught is much the greatest at a low rate of speed, since the more rapid the velocity, the greater proportion of his muscular exertion is required to transport his own weight. But it is ascertained, on the Baltimore and Ohio rail-road, that a speed of ten miles an hour may be kept up by horses travelling stages of six miles each, which would perform the whole distance between Baltimore and the Ohio river in thirty-six hours. The whole expense of transportation by horse power, including cars, drivers, and every expense except repairs of the road, on the same rail-road, from January to September, 1831, amounted to about one third of the gross tolls received; and this expense, it was calculated, might be very materially reduced. The average consumption of coke by a locomotive engine, on a passage from Liverpool to Manchester, thirty-two miles, is stated by Mr Wood to be 800 pounds, and the water evaporated 225 gallons per hour, and 450 gallons on the passage. Mr Wood computes that one of those locomotives will perform the work of 240 horses travelling at the rate of ten miles per hour upon a turnpike road, the velocity of the locomotive being fifteen miles per hour. The fact is well established, that where the transportation is sufficient for supplying adequate loads for locomotive engines, and where the road is so constructed that they can be advantageously used, and where fuel is not exceedingly expensive, they afford much the most economical motive power.

The following is an account of the principal railroads projected, constructing or finished, in Europe and America: — The first Railway Act which received the sanction of Parliament was in 1801. The total number of Acts, inclusive of this one, passed in each year, has been as follows:—

1801—1
1802—2
1803—1
1804—1
1808—1
1809—2
1810—1
1811—3
1812—2
1814—1
1815—1
1816—1
1817—1
1818—1
1819—1
1831—1
1823—1
1824—2
1825—5
1826—6
1827— 6
1828—11
1829— 9
1830— 8
1831— 9
1832— 8
1833—11
1834—14
1835—18
1836—35

making in all 164 Acts. These will be classed in chronological order, with the view of affording a view of the progress which the system of communication is making; the total length of rail being 850 miles.

1801. *The Surrey Iron Railway Company* was incorporated "for making and maintaining a railway from the town of Wandsworth to the town of Croydon, with a collateral branch into the parish of Carshalton, and a navigable communication between the river Thames and the said railway, at Wandsworth. In length this railway is about nine miles, and the cost about £60,000. It was erected for the conveyance of lime, chalk, fuller's earth, &c., to London, and the return of coals and manure, it has not answered the expectations of the proprietors: the moving power is from horses alone.

1802. *The Caermarthenshire Railway or Tramroad Company* was incorporated "for making and maintaining a railway or tramroad from *the Flats*, in the parish of Llanelly, in the county of Caermarthen, to certain lime-works called Castell-y-Garreg, in the parish of Llanfihangel-Aberbythick in the said county; and for making and maintaining a dock or basin at the termination of the said railway or tramroad, at or near the said place called *the Flats*." It is sixteen miles in length. Its chief object is the conveyance of limestone, coal, and iron. *Sirhowey Tramroad*. This railway extends from the Monmouthshire canal at Newport through Tredegar Park to Sirhowey Furnaces, a distance of eleven miles. The capital which the company was empowered to raise was £45,000. Its use is almost entirely confined to the conveyance for shipment, on the Monmouthshire canal, of the produce of the Tredegar Iron Works.

1803. *The Croydon, Merstham, and Godstone Railway* is a continuation of the Surrey Railway, and commences on the west side of Croydon, runs by the side of the Brighton road to Merstham, and thence to the town of Reigate. A branch road from Merstham is carried to Godstone Green. The length of the whole is 15¾ miles, the cost of its construction was £90,000. The railway is a double line throughout, with a pathway on each side, twenty-four feet wide. Its principal object is the conveyance of lime and coal to and from London, in wagons drawn by horses.

1804. *The Oystermouth Railway* begins at Swansea, at the terminus of the Swansea canal, and is carried in a south-westerly direction to Oystermouth, a distance of about six miles; a branch is carried northward from Swansea, on the west side of the canal, to Morriston. The capital of the company is £12,000. This railroad passes through a district rich in minerals.

1808. *The Kilmarnock Railway* runs between the town of Kilmarnock, in Ayrshire, and the Troon, a distance of 9¾ miles. The capital of the company, raised under the Act of incorporation, is £40,000. Its object, in which it has proved successful, was to open a cheap conveyance for coal, lime, and merchandise, to and from the various large works in its neighbourhood.

1809. *The Bullo Pill, or Forest of Dean, Railway*, proceeds from the river Severn, near the town of Newnham, to the summit of the hill above Churchway Engine, in the forest of Dean, in the county of Gloucester; there being three short branches from the main line to different coal mines in the forest, the length is about 7½ miles, capital of the company, by its Act of incorporation, is £125,000. The forest of Dean belongs to the Crown, to which a rent is reserved of £100 per annum, and a guinea a week towards payment of her Majesty's inspectors. The business of this railway consists in the conveyance of the timber, coal, iron ore, &c., in the forest to the river Severn. *The Severn and Wye Railway*, commences at Lidbrook on the Wye and terminates at the Lower Verge, both in Gloucestershire; it is connected with the Severn at Nass Point, by a canal one mile in length. Its extent, including nine branches, laid from the main line to coal and other mines, is about twenty-six miles. The joint stock of the company is £110,000. The company pays to the Crown for the ground occupied by the main line and branches in the forest of Dean, £310 per annum, and one guinea a week towards the expense of inspectors. This railway affords means for conveying for shipment the timber of the forest.

1810. *The Monmouth Railway* is also connected with the forest of Dean, and runs from Howler Slade to the town of Monmouth. Several branch railways communicate with various quarries and collieries near to the main line. The subscribed capital is £22,000.

1811. *The Berwick and Kelso Railway Company* was incorporated for the purpose of making and maintaining a railway from Spittal, in the county of Durham, to Kelso, in Roxburghshire. The company was empowered to raise £130,000. Twenty-seven years have elapsed since the incorporation of the company, without its having proceeded in the execution of the work, and it does not at present appear likely that this railway will ever be completed. *The Hay Railway* commences at the wharf of the Brecknock and Abergavenny canal, near Brecon, and ends at the village of Parton Cross, in the parish of Eardisley, in Herefordshire, taking a course of twenty-four miles through a mountainous district. The capital of the company is £50,000. This railroad affords facilities for the transit of their mineral and other products, through the Brecknock and Abergavenny canal, or by the Kington railroad, which joins it at Parton Cross, through the Leominister canal. *The Llanfihangel Railway* commences on the bank of the Brecknock and Abergavenny canal, two miles north-west from Abergavenny, and ends at Llanfihangel Crucorney, also in

Monmouthshire, a distance of about 6¼ miles. The capital subscribed is £20,000. Its uses are similar to those made of the Hay railway.

1812. *The Grosmont Railway, or Tramroad,* commences at the termination of the Llanfihangel railway, and ends at Llangua Bridge, on the road between Abergavenny and Hereford, a distance of nearly seven miles, in the course of which there is a difference in the level of 166 feet. The capital raised is £13,000. *The Penrhynmaur Railway* commences at the Penrhynmaur coal-works, and is carried to Red Wharf, in the parish of Llanbedgroch, in the county of Anglesea, with a branch which follows the shore of Red Wharf Bay for a short distance northward. In length, it is rather more than seven miles. Its capital of £10,000, was provided by the earl of Uxbridge and Mr Holland Griffith.

1814. *The Mamhilad Railway* commences in the parish of that name, at the bank of the Brecknock and Abergavenny canal, and ends at Usk Bridge, likewise in the county of Monmouth, a distance of rather more than five miles. The capital £6,000, in shares of £50 each.

1815. *The Gloucester and Cheltenham Railway* commences at the basin of the Gloucester and Berkeley canal, in the city of Gloucester, and ends at the Knapp toll-gate at Cheltenham, a distance of about nine miles. The capital is £50,000.

1817. *The Mansfield and Pinxton Railway* commences at Bull's head Lane in the town of Mansfield, Nottinghamshire, and ends at Pinxton Basin, near to Alfreton in Derbyshire, where it communicates with a branch of the Cromford canal. A branch begins about a mile and a half from Pinxton Basin, and passes eastward about a mile and a half to the Cromford canal, a short distance from the Codnor Park works. It is 8¼ miles long; capital £32,800. This line passes through a country abounding with minerals.

1818. *The Kington Railway* is a continuation of the Hay Railway, which it joins at Parton Cross in Herefordshire, and is carried to Kington in the same county, and thence to the Lime-works, near Burlinjob, in Radnorshire. In length, it is about fourteen miles; capital, £23,000. It is used for the conveyance of coal, iron, lime, and agricultural products.

1819. *The Plymouth and Dartmoor Railway* commences at the Sound at Sutton Pool, a short distance south of Plymouth, and ends at Bachelor's Hall, in the parish of Lydford, near to the prison, erected for the custody of prisoners of war, on Dartmoor; it has a branch to the lime-works at Catsdown, and altogether its length, through a very circuitous course, is about thirty miles. The capital raised for this work was £35,000.

1821. *The Stratford and Moreton Railway Company* was incorporated "for the purpose of making and maintaining a railway or tramroad from Stratford-upon-Avon, in the county of Warwick, to Moreton-in-Marsh, in the county of Gloucester, with a branch to Shipston-upon-Stour, in the county of Worcester. The length of the main line is about sixteen miles, and of the branch 2¼ miles; capital £50,000. The principal use made of this railway is for conveying coal, stone, and agricultural produce. *The Stockton and Darlington Railway* was the first constructed public railway in England, upon which locomotive steam-engines have been used as the moving power. It begins near the town of Stockton, on the left bank of the river Tees, whence it is carried in a southerly direction for about four miles. A branch is continued in the same direction through Egglescliffe to Yarm Bridge, while the main line turns to the west, and afterwards to the north-west, by the town of Darlington, whence its course is nearly north to the point of junction with the Clarence railway at Sim Pasture. Turning again to the north-west it then passes the town of West Auckland, and ends at Witton Park colliery, about [illegible] miles and a half west of Bishop's Auckland. The main line is about twenty-five miles long, and there are four branches to the west of Stockton, and a fifth to the east of that town, and the whole extent of railway forty miles. The extension to the Tees' mouth commences at Stockton and crosses the river Tees into Yorkshire, by a suspension bridge, [illegible] feet wide within the piers, and thirty feet above low-water mark. The joint stock of the company is divided into 1,000 shares of £[illegible] each, in addition to which permission is given in the Acts to borrow £150,000 on bond. The scheme has in every way proved eminently successful.

1824. *The Redruth and Chasewater Railway Company* was incorporated for making and maintaining a railway or tramroad from the town of Redruth in the county of Cornwall, to Point Quay in the parish of Feock, in the same county, with several branches therefrom: and also for restoring, improving, and maintaining the navigation of Restrougett Creek, in the same county. The main line of this railway begins at the east side of the town of Redruth, whence it proceeds south-eastward round the mountain of Carn-Marth; then north-easterly to Twelve Heads, and then again south-eastward to Point Quay, which is a small shipping port at the head of Carreg-road. The length of this main line is nine miles and a quarter, besides which there are four branches, amounting together to rather more than five miles; the capital is £[illegible] and the object of the undertaking is the conveyance of the rich mineral products of the district for shipment. *The Monkland and Kirkintilloch Railway* begins at Palace Craig, in the parish of Old Monkland, and traverses a distance of ten miles in a northerly direction to Kirkintilloch, in Dumbartonshire. There is a branch at Howes to a [illegible] three-quarters of a mile from the main line. The capital raised, in £50 shares, is £25,000. The object of the projectors, which has fully succeeded, was to open a means of transport for the coal and iron of the district to the Forth and Clyde canal. This line is also connected with the Garnkirk and Glasgow, and the Ballochney railways.

1825. *The Rumney Railway Company* was incorporated 'for making and maintaining a railway or tramroad from the northern extremity of a certain estate called Abertyswg, in the parish of Bedwelty, in the county of Monmouth, to join the Sirhowey railway, at or near Pye Corner, in the parish of Bassaleg, in the same county.' This end of the line is about two miles and a half west from Newport. The work takes its name from the river Rumney, along the bank of which it runs, and the iron works called by the same name, near to which it begins. The length of the railway is 21[illegible] miles; capital £47,100, in shares of £100 each. It is used for the conveyance of the mineral produce of the district. *The West Lothian Railway* begins at the Edinburgh and Glasgow Union Canal near [illegible]hall, in the parish of Uphall, and proceeds by Whitburn to Shotts; its length, including branches, is about twenty-three miles. The capital raised was £40,700, in shares of £[illegible] *The Cromford and High Peak Railway* begins at the Cromford canal, one mile south of Cromford, and ends at the Peak Forest canal at Whaley Bridge. Its length is about thirty-four miles in its course it passes over some high land, its greatest elevation being 990 feet above the level of the Cromford canal, the ascent is accomplished by means of several inclined planes, up which the wagons are drawn by stationary steam-engines, and in its course the railway passes through a hill by means of a tunnel 638 yards long. The capital is £164,000, divided in shares of £100 each. By means of this railroad a convenient communication is opened for traffic between the counties of Derby, Nottingham, and Leicester, and the town of Manchester and port of Liverpool. Contrary to the now almost universal pratice in the construction of railways, cast-iron rails have been adopted in preference to malleable iron. They are cast in lengths of four feet each, which weigh 84 lbs., or 63 lbs. per yard. Fifty-two bridges and archways have been built. *The Nanttle Railway* commences at the slate-quarries near Nanttle Pool, in the county of Caernarvon, and proceeds first to the west and then to the north as far as the shipping quay at Caernarvon. The joint-stock capital of the company is £20,000, in shares of £100 each. *The Portland Railway* is a short line of little more than two miles, beginning at the priory lands in Portland Island, and ending at the stone piers, Portland Castle. The capital is £5,000, in £50 shares. *The Duffryn-Llynvi and Port Cawl Railway* begins in the parish of Llangoneyd to a bay called Perth Cawl, in the parish of Newton Nottage, both in Glamorganshire. Its course is first to the south and then to the west, and its length 16¾ miles. From near the commencement the line is one continued descent, at first of more than fifty feet in a mile, but afterwards of fifteen feet, and then of twenty-eight feet per mile. The capital is £60,000, divided into £100 shares. This railway opens a communication between many large iron and coal mines, and quarries of limestone and freestone, and the Bristol Channel.

1826. *The Ballochney Railway* begins at a branch of the Monkland and Kirkintilloch railway, 1½ mile west of Airdrie, in Lanarkshire, and proceeds to Ballochney in the parish of New Monkland, in the same county. The main line is four miles long, and near to the middle of its course is a branch a mile and a quarter long, leading to some coal-pits near the village of Clerkston. The capital, raised, was £18,425, divided in shares of £25 each. The traffic on this railroad is chiefly confined to the supplying of coal to Glasgow, and the conveyance of coal and iron-stone to the furnaces in its neighbourhood. *The Dulais Railway* begins at Aber-Dulais, runs parallel with the Dulais river on its western bank, to Ynis-y-bout, when it crosses the river and follows its course on the eastern side to some lime-works at Cwm-Dulais, all in the parish of Cadoxtone juxta-Neath, in Glamorganshire. Its length is about 8¾ miles, the capital is £10,000; it is used for the conveyance of iron, iron-stone, lime, and coals. *The Dundee and Newtyle Railway* begins on the north side of the town of Dundee, and proceeds in a northerly course for eleven miles to Newtyle. It passes through a hilly district. The wagons employed to carry goods are assisted up five inclined planes by stationary steam-engines, but coaches with passengers have of late been impelled by locomotive engines. The capital is £40,000, but the cost of the work has exceeded this by £10,000. This railway is found to be useful in connecting the fertile district of Strathmore with Dundee, and the navigation of the Tay: goods are conveyed by it at one-third the rate formerly charged on the turnpike road.

The Edinburgh and Dalkeith Railway begins on the south side of the city of Edinburgh, near Salisbury Craig, whence it proceeds eastward to Redrow, it thence crosses the north Esk river, about half a mile on the west side of Dalkeith, and thence to the banks of the south Esk river, near Newbattle Abbey. There are three branches—one from a place called Wanton Walls to Fisher Row Harbour in the Firth of Forth; another from Cairney to the collieries near Musselburgh, and a third from Neddrie North Mains by Portobello, to Leith Harbour. The main line is 10¾ miles long, and the branches are 6½ miles. The capital raised is £125,000, in shares of £50 each. The object of this work was to open a better and cheaper communication than previously existed between the collieries and limestone quarries in the district through which it passes, and the Scottish capital, as well as the port of Leith. *The Garnkirk and Glasgow Railway* begins at Cargill colliery, near Gartsherrie Bridge, in Lanarkshire, where it joins the Monkland and Kirkintilloch railway, and proceeds in a westerly direction to the junction of the Forth and Clyde and the Monkland canals, near Glasgow, on the road between Glasgow field and Keppoch. Its length is about 8¼ miles; and the cost of construction about £40,000. This railway was opened for use in the summer of 1831. The power employed is the locomotive steam-engine. The object of this work is the conveyance of passengers and the product of the Lanarkshire coal-field to Glasgow, for the use of the inhabitants, and for shipment to other parts. *The Heck and Wentbridge Railway Company* was incorporated 'for making and maintaining a railway or tramroad from Heck-bridge, in the parish of Snaith, to Wentbridge, in the parish of Kirksmeaton, all in the West Riding of the county of York.' From Wentbridge, which adjoins the turnpike-road between Doncaster and Ferry-bridge, the course of this railway is rather circuitous, in a north-east direction, until it ends at the Knottingley and Goole canal, which is part of the Aire and Calder navigation, a distance of about 7½ miles. The capital is £18,900, in shares of £100 each. It is used to convey the stone procured at Wentbridge and Smeaton for shipment to the London market.

The Liverpool and Manchester railroad. The commencement of the railroad at Liverpool is in the company's yard in Wapping. Here the lower entrance of the great tunnel is accessible through an open cutting, twenty-two feet deep and forty-six feet wide, being a space sufficient for four lines of railway, with pillars between the lines, to support the flooring, &c. of the warehouses of the company, which are thrown across this excavation, and under which the wagons pass to be loaded or discharged through hatchways communicating with the stores above; wagons loaded with coal or lime pass under the warehouses to the open wharves at the Wapping end of the station. Proceeding along the tunnel, the line of railway curves to the south-east, till it reaches the bottom of the inclined plane, which is a perfectly straight line, 1980 yards in length, with a uniform rise of three fourths of an inch to a yard. The railway from Wapping to the commencement of the inclined plane is level; the whole rise, therefore, from Wapping to the tunnel mouth at Edgehill, is 123 feet. The tunnel is twenty-two feet wide and sixteen feet high, the sides being perpendicular to the height of five feet, surmounted by a semicircular arch; the total length is 2250 yards. The height, from the roof of the tunnel upwards to the surface of the ground, varies from five to seventy feet. The whole length of this vast cavern is lighted with gas, and the sides and roof are white-washed to add to the effect of the illumination. At the eastern end of the tunnel, the railroad emerges into a spacious area forty feet below the surface of the ground, cut out of the solid rock. From this area there returns a small tunnel, 290 yards in length, fifteen feet wide and twelve feet high, parallel with the large one, but inclining upwards in the opposite direction, and terminating in the company's premises, in Crown street, at the eastern boundary of Liverpool; this is the principal station for the railway coaches, and the depot for coals for the supply of the higher districts of the town. In September, 1831, the company resolved to construct a new tunnel in order to be able to dispense with the omnibuses, which are employed to convey passengers from the town to the station on the railroad from which the carriages for passengers start. The new tunnel is to be one and a third mile in length, twenty-five feet high, twenty-two feet wide, and to have an inclination of one foot in 106. The roof is to be coated with Roman cement. The time which will be employed in conveying passengers through this tunnel will be three minutes. The expense is estimated at less than £100,000. Proceeding eastward from the tunnels, the road passes through a Moorish archway, which connects the two engine-houses, and forms the grand entrance to the Liverpool stations. The traveller is now upon the open road to Manchester; the line of the railway is perfectly level, and slightly curved. Crossing Wavertree-lane, the railway descends for five and a half miles, at the rate of four feet per mile. The road, a little beyond Wavertree-lane, is carried through a deep marl cutting, under several massive stone arch-ways, thrown across the excavation to form the requisite communications between the opposite sides of the railroad. Beyond the marl cutting is the great rock excavation through Olive mount, about half a mile to the north of the village of Wavertree. Here the traveller passes through a deep and narrow ravine, seventy feet below the surface of the ground, over which are thrown several bridges; the road winds gently to the south-east. Emerging from the Olive mount cutting, he approaches the Roby embankment, which stretches across the valley for about two miles, varying in height from fifteen to forty-five feet, and in breadth, at the base, from sixty to 135 feet. The railroad next crosses the Huyton turnpike, and proceeds, in a slightly curved direction, to the bottom of the inclined plane at Whiston, between seven and eight miles from the company's station in Liverpool. This plane rises three eighths of an inch in a yard. It is a mile and a half long, in a straight line; the inclination is hardly perceptible, except by the decrease in the speed of the carriages. At the top of the Whiston plane, the road for nearly two miles is exactly level. About half a mile from the top of the inclined plane, the turnpike road from Liverpool to Manchester crosses the line of the railroad in an acute angle of thirty-four degrees, by a stone bridge built on the diagonal principle, each stone being cut to a particular angle, to fit into a particular place. The span of the arch measured at the face is fifty-four feet, while the width of the railway underneath, measured from wall to wall, is only thirty feet—each face of the arch extending diagonally forty-five feet beyond the square. Passing over the summit level at Rainhill, the traveller arrives at the Sutton inclined plane, which descends in the opposite direction, and is similar, in extent and inclination, to the Whiston plane, the top level being eighty-two feet above the base of each plane. Parr Moss is the next object of attention. This moss is about twenty feet deep; the materials forming the railroad, as they were deposited, sank to the bottom, and now form an embankment in reality twenty-five feet high, though only four or five feet above the surface of the moss. Over Sankey valley and canal, the railway is carried along a magnificent viaduct of nine arches, each fifty feet span, built principally of brick with stone facings; the height from the top of the parapets to the water in the canal being seventy feet, and the width of the railway between the parapets, twenty-five feet. The approach to this structure is along a stupendous embankment, formed principally of clay. A few miles beyond Newton is the great Kenyon excavation, from which about 800,000 cubic yards of clay and sand were dug. Near the end of this cutting, the Kenyon and Leigh junction railway joins the Liverpool and Manchester railroad by two branches pointing to the two towns respectively. The former railroad joins the Bolton and Leigh railroad, and thus forms the connecting link between Bolton, Liverpool and Manchester.

From the Kenyon excavation, the Liverpool and Manchester railroad passes over the Broseley embankment, Bury lane, and the small river Glazebrook, to Chat Moss. This moss was so fluid that a rod of iron would sink into it by its own gravity. It comprises an area of about twelve square miles, varying in depth from ten to thirty-five feet. Beyond Chat Moss, the road traverses the Barton embankment, crossing the low lands for about a mile between the moss and the Worsley canal, over which it is carried by a neat stone bridge. The immediate approach to Manchester is through a portion of Salford. Over the river Irwell, the railway is carried by a handsome stone bridge, consisting of two arches, each fifty-eight feet span, and then over a series of arches to the company's station in Water street and Liverpool road in Manchester. This railroad consists of two tracks of rails, and is thirty-two miles in length. The whole number of bridges is twenty-five, and the number of large culverts, thirty-six. The rails are edge rails. It was constructed in four years, and opened Sep. 15, 1830. This road is constructed on the most approved principles. On the clay and stone, on which the road is formed, a layer two feet thick, of broken rock and sand, is deposited, one foot below the sleepers, and one foot distributed between them. The sleepers, or blocks on which the rails of the road rest, are composed of hard free-stone, from Peel, in Lancashire, on the excavated part of the road (about eighteen out of the thirty-two miles); while, on the raised embankments and the mosses, the rails are supported by sleepers of oak or larch. The stone blocks are about two feet over, and about a foot and a half thick; for the reception of the iron chairs, two holes are drilled in each block, and filled up with hard oak pins; the chairs are then fastened on by two large spikes driven through them into the oak; which process is found to be so effectual, that it is almost impossible to separate a chair from a sleeper when thus fastened.

The following statement, contrasting the anticipations of the projectors, with the actual results as shown to the end of 1835, exhibits the manner and degree in which the experience thus acquired may be made useful by parties embarking in similar projects. It is collected from the evidence given before parliament in 1825 and 1826, previous to the passing of the act of incorporation; and from the half-yearly reports of the directors of the company, upon which the dividends have been declared by the proprietors:—

Evidence in 1825—6.	*Results in 1835.*
1.—The capital of the com- any is L.510,000, with power › borrow L.127,500. Lord tafford has 1,000 shares, or ie-fifth of the whole con- rn. He appoints three di- ctors: twelve are elected the other shareholders. eposit L.5 per share. No rson allowed (as an original bcriber) to hold more than shares. The scrip, or cer- cate, declares the name of person to whom it was nted, and that no transfer llowed until the act is ob- ied.	1.—There has been expended on construction of the rail and works, to 31st December 1835— Road, tunnels, &c. L.885,463 Warehouses and stations . . . 248,518 Locomotive engines, coaches, and wagons . . . . . 61,175 L.1,195,156 The money was raised by— Original shares L.510,000 Additional ditto 290,000 Borrowed from Exchequer Loan Commissioners, at 3½ per cent. 100,000 Borrowed from individuals, at 3½ and 4 per cent. 300,000 L.1,200,000
—It is proved that the es of communication be- en the termini are not cient, and that great de- take place. The prices charged are per ton. — The railroad engages to carry at per ton. on . . 15s. . . 11s. . . 10s. . . 9s. r . . 12s. . . 9s. rn goods 10s. . . 11s. tonnage rates to be ed 5 per cent. for every per share, the company s above L.10 per share. fare in coaches, 10s. ide, ... 6s. oad fares 7s. 6d. to 3s. 6d.	2.—The public have benefited by the railway in the reduction of charges as follows, in the last year:— 2s. 6d. each on 500,000 passengers L.62,500 2s. 6d. each on 450,000 tons of goods by all conveyances 55,250 2s. per ton on 1,240,000 tons of coal, for the supply of Liverpool and Manchester, the price of which has been reduced in consequence of the reduction of charge per railroad 124,000 Total per annum L.241,750 Besides a rapidity of communication which, in a commercial country, is invaluable. The 10 per cent. clause has not yet come into operation.
The number of passen- xpected is half the the coaches can take, was found to be from 00 per day. Fares 10s. 6s. outside. They ur inside and twelve e.	3.—The greatest number of passengers the coaches could carry, in 1825, was 600 per day; average 450. They paid, on an average, 7s. 6d. each, and were four to five hours on the road— Total receipt gross, annually L.61,320 In 1835 the railroad took upwards of 1,500 per day, at 5s. each: average 1½ hour on the road— Total receipts L.120,334. Thus doubling the sum received, at two-thirds the previous charge.
he net income expec- Per ton. assengers . L.20,000 ttle . . . 5,000 ods . . . 27,500 als . . . 10,000 L.62,000	4.—The sum received from passengers, average 5s. each L.120,334 87,000 sheep, 4d. each 950 108,000 pigs, 10d. each 4,850 Goods 84,206 Coal 17,088 L.227,428 Expenses of engines, duty, interest of money, &c. 143,809 Net receipt L.83,619
Proposed railroad a and integral part the termini specified.	5.—There are branch railways from the Manchester line to Wigan, Bolton, St Helen's, Warrington, and Runcorn.
competing line in in progress, or in ation.	6.—Application has been made to parliament for a new line, but without success.
re are two inclined ½ mile long each— of 1 in 90, the other ntended to be work- onary engines.	7.—The inclined planes are considered defects on the road. They are worked by additional powerful locomotive engines, which help the trains up.
Moss is considered st difficulty in the engineering department, being a soft or flow moss of 20 to 40 feet deep. An eminent opposing engineer says, 'no man in his senses would attempt a railway over Chat Moss.' He calculates it will cost L.227,000 to cross it.	8.—Chat Moss has not been found difficult. It is four miles across, and cost to complete it L.40,000.
9.—It is intended to have two tunnels at the Liverpool terminus. Strata, red sandstone.	9.—There are two tunnels, one 300 yards long, inclination 1 in 72: the other 2,300 yards, inclination 1 in 48.
10.—The line is favourable; no curve greater than one mile radius, except at the termini.	10.—Curves generally favourable.
11.—Length of main line, 31 miles.	11.—The line is 31 miles; 5 miles shorter than the turnpike-road.
12.—The line is considered favourable.	12.—With the exception of the two inclined planes, the line is favourable. The steepest gradient, exclusive of the planes, is 1 in 849.
13.—The line is intended to cross the turnpike and other roads on the level frequently; but as the speed anticipated is 6 to 10 miles per hour, no great inconvenience is expected.	13.—The line crosses roads on the level 17 times, and requires vigilant gatemen for the public safety, because the engines travel at from 20 to 30 miles an hour. The expenses of lodges, gates, and gatemen at each crossing may be set against the cost of a bridge.
14.—The sum of L.510,000 is considered sufficient to complete the work.	14.—The works have cost L.1,200,000. This includes L.50,000 paid for engineering and parliamentary expenses, and L.248,518 in warehouses, stations, &c., and L.61,135 for engines, carriages, and wagons.
15.—The expenses are expected to be 33 per cent.	15.—The expenses amount to 62 per cent. on gross receipts. In this are included the cost of collecting and delivering goods, interest of money, and duty on passengers.
16.—Satisfactory evidence produced that the receipts will pay the expenses, and a fair remuneration.	16.—The net revenue, after paying all charges and expenses, is L.83,620, or rather more than 10 per cent. on the shares.
17.— Landowners—Assents 152 Neuter 97 Dissents 86 335 Occupiers—Assents 302 Neuter 66 Dissents 128 496 Miles—Assents 11 Neuter 5 Dissents 15 31	17.—No land-owner would now consent to have the line taken from him.
18.—Engineers examined in favour of the bill—Mr Rennie, Mr Stephenson, Mr Cubitt, Mr Rastrick, and Mr Vignoles. Against it—Mr Giles, Mr Leather, Mr Wild, Mr Smith, and Mr Palmer. Evidence most contradictory.	18.—With the exception of the additional cost, the evidence in favour of the bill has been more than confirmed.
19.—The petitioners against the bill were three water-companies, all contending that additional communication was not required.	19.—The line of road was altered to avoid the property of some dissentients, to their disappointment at the present day. One of these, a lady, has land near the station at Manchester. Her surveyors thought the value of it would fall from 6d., the price then given, to 4d. per yard, chief rent; whereas it has risen to 1s. 6d.
20.—The bill excited so much interest, that the committee sat during Mr Adam's opening speech, and the first part of the evidence in the body of the house of Commons. In the year 1825, the bill went into committee on 21st March, and remained in it	20.—In proof of the great safety of railroad travelling, on the 17th of April, 1836, a locomotive engine, going at the rate of 20 miles an hour with a train of carriages, broke its axletree, ran off the road down an embankment of 15 feet; two of the carriages were overturned, when only

until 1st June. The committee sat 38 days.

On the 30th May, the Committee voted the preamble proved.

On the 1st June they voted the first clause, containing the names. The second clause, that the company be empowered to make a railway, was negatived. The bill was consequently abandoned, but was obtained the following year.

Stress was laid by its opponents upon the inconvenience and dangers to arise from using engines. one person was slightly hurt in attempting to get out of the window.

The fatal accidents have been very few, and have in almost every instance arisen from the persons who met with the same acting in opposition to the directions given by the railway directors.

From the register of the company, it appears that the disbursements amount to fifty-eight per cent. of the gross receipts, a result considerably higher than is usually expected by railway proprietors.

It appears that the number of passengers conveyed along the line from its opening in September 1830, to 30th June 1836, was 2,393,767, being on an average 1,132 persons daily. During 1831 it is probable that a greater number of persons were attracted to the railway through curiosity than have since been so attracted.

In 1832 the number was	356,945
1833 —	386,492
1834 —	436,637
1835 —	473,847

And in the first half of 1836 the passengers were 222,848, being an excess of 17,000 over the corresponding half of 1835.

Since the beginning of 1831 an account has been kept, by which it appears that, in five years and a half, the number of trains with passengers has been 34,281, or, on the average, a small fraction more than seventeen trips daily, the average number of persons conveyed each time being 67·72, or nearly 67¾. The number of trips in the same time with goods and coals was 26,562, and the number of tons conveyed 1,468,310, being on the average 13·22 trips daily, and the average weight conveyed at each trip 55¼ tons.

Early in 1832, it was determined to form another tunnel also under the town from Edge Hill to Lime street, which should be appropriated to the use of passengers only. The excavation of this tunnel presented considerable difficulties, but these have been overcome, and, the whole being completed at the cost of £150,000, it was opened for use on the 15th of August 1836.

1827. *The Canterbury and Whitstable Railway* begins on the north side of the city of Canterbury, adjoining the river Stour, and proceeds by St Dunstan's and St Stephen's, through Clowes Wood to Whitstable Bay, in the county of Kent. The length is six and a fourth miles, formed into a series of inclined planes, a great part of which are of too great an inclination to allow of locomotive power, and accordingly three stationary engines are provided: on a small portion of the line, which is nearly level, locomotive engines are used. A mile and a quarter from Canterbury is a tunnel twelve feet wide, twelve feet high, and about half a mile long. The highest point, which occurs about midway on the line, is 220 feet above the level of the sea at Whitstable. The capital was £31,000; but this proving inadequate to the completion of the work, power was obtained from parliament to create £40,000 additional stock, by the creation of £50 shares, which were not to be issued at a less price than twenty pounds each.

The Johnstone and Ardrossan Railway was constructed in place of so much of an intended canal from Glasgow and Paisley to Ardrossan, which had been completed only as far as Johnstone. It begins at the canal wharf at Johnstone, and is carried south-west by Lochwinnoch and afterwards along the banks of the river Rye to Kilwinning; it then turns to the west through the collieries by Kerrylaw, and thence northward of the town of Saltcoats to the harbour of Ardrossan. The railway is 22¼ miles in length. The capital is £95,600. It is chiefly used for the export of coal for the supply of the north and east coast of Ireland, and for the importation of agricultural produce for the supply of Glasgow and Paisley.

1828. *The Bristol and Gloucestershire Railway* is nine miles in length; it begins at Cuckold's Pill on the east side of Bristol, and is carried in a course, through various collieries, to Coalpit heath, in the parish of Westerleigh, Gloucestershire. The capital of the company is £45,000, divided into shares of £50 each. The immediate object of the work is the cheaper supply of stone and coal to the city of Bristol, but there appears a great probability that the line will be extended so as to embrace the original designs of the projectors, which was the establishment of a railroad connexion between Bristol and Birmingham. *The Bolton and Leigh Railway* begins at the Manchester, Bolton, and Bury canal, near the town of Bolton-le-Moors, in Lancashire, and proceeds in a south-west direction through various collieries to the branch of the Leeds and Liverpool canal, which communicates with the duke of Bridgewater's canal at Leigh. The length of the railroad, including the extension to the Manchester line, is little more than nine miles. The capital is £69,000, in shares of £100 each. *The Bridgend Railway* was constructed in order to enable the town of that name in Glamorganshire to participate in the advantage derived from the Duffryn and Llynvi railway. It begins at the east bank of the river Ogmore, close to Bridgend, and proceeds to its junction with the Duffryn Llynvi line, near the village of Cefn Gribbwr. The railway is four and a half miles long, and rises in the distance 190 feet: the capital employed is £6,000, divided into £20 shares. *The Slenelley Railway.* This railway extends from Slangeneck collieries to Slenelley harbour, descending to the floating dock. The length is four miles. The floating dock is capable of containing about fifty sail of colliers. *The Clarence Railway*, in the county of Durham, begins at Samphire Beacon, on the river Tees four miles north-east of Stockton, and proceeds to Sim Pasture, where it joins the Stockton and Darlington railway. The main line is only fifteen and a half miles long. There are six branches extending more than thirty miles; these lead from various parts to the city of Durham, to Stockton, to Bishop Auckland, to the lime and coal works at Sherburn, to Byer's Green, and to Chilton. The capital is £200,000, divided into shares of £100. Several valuable coal-fields and lime-stone quarries have been more effectually and cheaply connected with the shipping part of Stockton by means of this railway.

1829. *The Warrington and Newton Railway* proceeds in a course directly north from Warrington to the south side of the Liverpool and Manchester railway at Newton, a distance of about four and a fourth miles. The capital is £53,000 in £100 shares. *The Wishaw and Coltness Railway* begins at Chapel, in the parish of Cambusnethan and joins the Monkland and Kirkintilloch railway at Old Monkland, all in the county of Lanark: it has several branches leading to different collieries. The capital is £60,000.

1830. *The Leeds and Selby Railway* begins at the east side of Marshlane, Leeds, and is carried eastward in nearly a straight line to the town of Selby, where it ends on the banks of the Ouse, its entire length being a small fraction under twenty miles. The capital is £210,000, in £100 shares. The object of this work was to facilitate the transmission of the manufactures of the West Riding of Yorkshire towards Hull, and the reception of the raw materials of manufacture which are principally received through that port. Before the opening of the Leeds and Selby railway, the number of persons going and returning by coach during the summer did not exceed 400 weekly, while the average number passing on the railway during the summer of 1835 was 3,500 weekly. The wagons and coaches on the railway are propelled by means of locomotive engines. When the communication shall be completed, as is intended, to Hull, there is reason for expecting a still greater traffic upon this line. *The Leicester and Swannington Railway* begins in the town of Leicester, at the Leicestershire and Northamptonshire Union canal. Its course is first north-west through a tunnel a mile and a quarter long; on leaving this it turns to the south-west for about three and a half miles, when it again proceeds north-westerly to the north end of the village of Swannington. Its length is 15¾ miles. The capital is £90,000, in shares of £50 each. It is used for the supply of coal and limestone to the town of Leicester. The quantity of coal conveyed upon it in 1835 was 135,000 tons.

1831. *The Dublin and Kingstown Railway* was constructed for the more intimately uniting Dublin with its suburbs Merrion, Black-rock, Booter's-town, Monk's-town, and Kingstown, the last of which is distant five miles and two-thirds from Westland-row, where the railroad begins in Dublin, and also the providing easy access to and from the steam-packets for travellers passing between Dublin and the coast of England. The railroad was opened for traffic on the 17th December, 1834, between which day and the 1st March, 1836, when the last report of the Directors was made, the number of passengers carried amounted to about 1,237,800, being on the average above 2,800 persons daily. At its commencement the rails are placed at an elevation of twenty feet from the ground, and are carried over and across the streets of Dublin by flat elliptical arches. The breadth of this viaduct is sixty feet between the parapets, and is calculated to receive four lines of rails, the two central lines for trains of passengers going and returning, and the exterior lines for lower vehicles with coal, granite, timber, and general merchandise. When past the Circular Road, the rails are brought to the level of the road, the boundary on each side is marked by a green sod bank, and protected by quickset hedges and a deep trench. From Merrion to Black-rock the road is elevated across the strand, and at high water has the appearance of a long mole stretching into the sea. The capital stock of the company is £200,000, divided into shares of £100 each. The cost of constructing the railroad and stations, locomotive engines, carriages, &c., and the expenses of obtaining the act of incorporation, have together amounted to about £237,000, or upwards of £40,000 per mile. This railroad has been almost wholly confined to passengers. It yields about eight per cent. per annum upon the amount of capital paid by the shareholders.

1833. *The London and Greenwich Railway* is the first executed railroad having its commencement in the metropolis. It connects the city of London with the populous towns of Deptford and Greenwich, by a line which shortens the distance nearly one-third. It begins at the east side of the south foot of London Bridge, and is carried in nearly a straight line to the High street of Deptford, whence it is continued with a gentle curve across the Ravensborne river to its terminus, about 200 yards from the church at Greenwich. The rails are laid throughout on a viaduct, composed of about 1,000 arches, each of eighteen feet span, twenty-two feet high, and twenty-five feet in width from side to side. To avoid even the appearance of danger in passing rapidly along a viaduct twenty-two feet above the ground, a parapet wall is built on each side, about four feet high. A branch railway, 750 yards long, is carried from the main line at the High-street, Deptford, to the river side, where a pier is being constructed to facilitate the embarking and landing of passengers by steam-vessels. The capital is £400,000, divided into 20,000 shares of £20 each. This work is so far advanced towards completion, that the line is open for passengers between London Bridge and Deptford, and trains of carriages are dispatched in each direction every half hour.

The principal railways for which acts of parliament have been obtained since the erection of those we have described, may now be referred to. The *London* and *Birmingham* railway, part of which was expected to be open in the month of July this year (1837). The *Birmingham* and *Manchester* railway is already opened, and it is worthy of remark respecting it that the locomotive engines have attained a speed on some parts of the line of not less than sixty miles an hour. The *Newcastle* and *Carlisle* railway is opened to a very considerable extent, and the remainder is rapidly hastening to completion. The *Southampton*, *Grand Union*, and *North Union* railways are likewise in a very advanced state. The same is to be said of the *Great Western* railway. The *Glasgow* and *Edinburgh* railway works are expected to commence early next year, and also those of the *Glasgow* and *Ayr* railway. A bill has been granted for the *Glasgow* and *Greenock* railway; but there are many doubtful of the success of this speculation. The *Paisley* and *Renfrew* railway has been open since the month of April last, chiefly for the transport of passengers.

For a great portion of the information on British Railways given above, we are indebted to a very valuable article in the Companion to the Almanac for the year 1837, published under the superintendence of "The Society for the Diffusion of Useful Knowledge."

France. The first railroad in France was a small one at Mount Cenis, constructed, in 1783, by Wilkinson, an Englishman, for the use of the foundries of Creusot. The *St Etienne and Andrezieux railroad* extends from St Etienne, which is the seat of extensive iron manufactures, and in the neighbourhood of rich coal-mines, to Andrezieux, on the Loire. It was commenced in 1825, and is the first railroad, of any extent, that has been constructed in France. The road consists of but one track of rails, and, with its branches, is about twelve miles and three fifths in length. The rails are of the edge kind, formed of cast iron. The curves of the road are from 250 feet to 333⅓ feet radius. The cost was 74,095 francs a kilometre, which is equal to 3280 feet 11 inches. The transportation upon it is effected by means of horses. The yearly transportation amounts to from 60.000 to 80,000 tons. This road is connected with the railroad from Roanne to Andrezieux.

The Roanne and Andrezieux railroad. This enterprise completes the grand system of communication between the south and the north, from the basin of the Rhone to those of the Loire and of the Seine, and will remedy the great difficulties in the navigation of the Loire above Roanne. It was undertaken principally with the view of facilitating the transportation of coal from St Etienne to the basins of the Loire and Seine, and will form a continuation of the railroad from the Loire to St Etienne. At Roanne, the Loire becomes navigable both in the ascent and descent. This railroad has only one track; the rails are of wrought iron; the curves in the road have 666⅔ feet radius. It was estimated that the annual transportation upon the road would be from 160,000 to 180,000 tons. The cost was 50,746 francs per kilometre.

The Lyons and St Etienne railroad extends from Lyons to St Etienne, following the river Gier and the Rhone, thus connecting two of the principal manufacturing cities of France. It is a double track railroad, and is thirty-four miles and four fifths in length. The rails are of wrought iron, supported on stone; the curves of this road have at least 1666 feet radius. The rout is divided into three divisions. The first division extends from Lyons to Givors. The principal works on this division are the bridge over the Saone, the deep cut at Pierre Bénite, the passage of Vernaison, and the tunnel of the Mulatiere. The second division extends from Givors to Rive de Gier. The tunnel of Rive de Gier is 3020 feet in length. The third division extends from Rive de Gier to St Etienne. It is connected by a branch road with the railroad from St Etíenne to the Loire. The tunnels upon this railroad are fourteen in number, and their aggregate length 13,123 feet. The shortest of these tunnels will contain two tracks, and will be sixteen feet four and a half inches wide; the other will be only ten feet in width, and will contain only one track. The cost of this road was 9,939,000 francs. It was commenced in 1826, and finished in 1831. The annual transportation is estimated at 317,000 tons. Locomotive engines, manufactured by Seguin, are used upon this road, which are said to be superior in power to the similar English engines, and are much lighter and cheaper. The locomotives of Seguin cost 10,000 francs, produce 400 kilogrammes of steam per hour (about 882 pounds), and weigh only 6000 kilogrammes (about 13,230 pounds).—The *Paris* and *Versailles railroad* was commenced in 1827. It extends from the road near the *Hopital des Invalides* at Paris to Versailles. It is intended only to convey travellers to the royal palace. The carriages contain six persons, drawn by one horse. Upon an average, 600 to 800 persons travel daily from Paris to Versailles.—The *Epinac railroad.* A company has been formed for the purpose of constructing a railroad from Epinac to the canal of Bourgogne. Epinac is situated in the department of Saone and Loire, near Autun. The railroad will be about seventeen miles and three fifths in length, and will establish a communication between the canals of the Centre and of Bourgogne. By this means, the collieries of Epinac will be able to supply with coals Franche Comte, Bourgogne, Champaigne, and, generally, all the country traversed by a part of the Saone, the canal Monsieur, the canal of Bourgogne and the Yonne; and, when the canal of Bourgogne is finished, they will be able to supply Paris with coals at a price much less than that of any now consumed there. A railroad is formed from Paris to Rouen, with branches to Havre and Dieppe, connecting the metropolis with a large manufacturing town, and with the seaports on the Channel. The cost of a railroad, with a double track, from Paris to Havre, was estimated at 118,000 francs per kilometre of 3280 feet, and the annual transportation between these two cities is about 300,000 tons. It has also been determined to construct a railroad from Paris to Pontoise. Measures were adopted to effect this object in the latter part of the year 1831. Railroads have been projected from Paris to Lyons, from Strasburg to Paris, and from Calais to Paris.

Germany. The Danube and Moldau railroad. The Danube and the Moldau have been connected by a railroad extending from Munthausen, in Austria, to Budweis, in Bohemia. It is seventy-five miles in length, and has a single track. It is constructed of iron tracks, laid upon rails of wood, and cost £135,000. This work was commenced in 1826. It produces to the proprietors an annual income of ten per cent. A single horse draws upon it a load of ten tons. It has been determined by the governments of Hanover and Brunswick to construct a railroad uniting the cities of Harburg and Luneburg with Celle and Brunswick. The chevalier Baader has proposed to unite the Danube and the Rhine by a railroad. The project of uniting these two rivers by a canal was first proposed by Charlemagne; and the project has lately been revived in Germany. The distance by a canal would be seventy-eight geometrical leagues, and the cost would be 8,000,000 florins. Baader proposes to substitute a railroad which would be only thirty-two geometrical leagues in length, by means of which boats might be transported from Donauwert to Markbreit on the Mein in thirty hours. The route proposed commences at Donauwert, and proceeds along the left bank of the Wornitz till it arrives opposite Hasburg, situated on the right bank; thence passing near Hopping, Schwanehoff, Wornitz, Oettingen, Bellerhaus, and Diebach, it terminates at Markbreit on the Mein.

Russia. In Russia, railways have long been in use.

Spain. A railroad from Jarez to Puerto de Santa Maria and San Lucar has been projected. The estimated cost is £40,000; and it is proposed to raise that sum in 4000 shares, at ten pounds each. It is under the direct patronage of the king and queen, the former having subscribed for sixty shares, and the latter for forty shares. The list also contains the names of four grandees and two ministers. At present, all the sherry wine which is exported is carried, at a great expense, from Jarez to the place of shipment; it is to be hereafter transported on the railroad. If the undertaking is successful, it will probably lead to the introduction of railways in other districts where they are equally wanted. Corn, in the interior of Spain, is almost valueless, from the cost and delay in transporting it to the coast.

United States. The Quincy railroad. This is the first work of the kind which has been attempted in the United States. It was constructed solely for the transport of granite, and commences at the granite quary in Quincy, and descending gradually terminates at the Neponset river, which flows into Boston harbour. It is a single track railroad, three miles in length. The ascent of the hill on which the quarry is situated, is overcome by a self-acting inclined plane. The sleepers are of granite, seven and a half feet long, and laid eight feet apart. The distance between the rails is five feet. The rails are of pine, twelve inches deep, with a covering of oak, on which are laid the thin plates of wrought iron upon which the cars traverse. The least radius of curvature is 300 feet. When it was first constructed, the usual load for one horse was ten tons, moving at the rate of three miles an hour. It has now (1837) been in operation ten years. The *Boston* and *Lowell railroad*. This railroad commences at Boston, near the entrance to the Warren bridge, on the westerly side of the bridge. The railroad crosses Charles river by a wooden viaduct, and, passing through Woburn, terminates at the basin of the canal in Lowell; from thence there are branches along the several canals to the factories. The Boston and Lowell railroad company was incorporated in June, 1830.

The *Boston* and *Worcester railroad*. A company for the purpose of constructing a railroad from Boston to Worcester was incorporated in June, 1831, by the legislature of Massachusetts. The length of the route is about forty-three miles. It is also proposed to continue this road to Connecticut river, and to construct a branch road to Milbury. The *Boston* and *Providence railroad*. A company was incorporated by the same legislature in June, 1831, with a capital stock of 1,000,000 dollars, for the purpose of constructing a railroad from Boston to the boundary line of Massachusetts, in the direction of Providence. The *Boston* and *Taunton railroad*. A company was incorporated in June, 1831, by the legislature of Massachusetts, with a capital of 1,000,000 dollars, for the purpose of constructing a railroad from Boston to Taunton, and from Taunton to any part of Taunton river at which the waters are navigable by vessels of heavy burden, with liberty to extend it from Taunton to the line of Massachusetts in the direction of Providence. The *Hudson* and *Mohawk railroad*. The company by which this railroad was constructed was incorporated by the legislature of New York in 1826, with a capital of 300,000 dollars, with liberty to increase it to 500,000 dollars. This increase has recently taken place. On August 12, 1830, the ground was broken at Schenectady for the purpose of commencing the construction of a double track road. With two slight exceptions, the road between the Albany and Schenectady planes is perfectly straight. The line passes principally over high table land, where there is little or no population. It is about sixteen miles in length. The railroad commences at the termination of the city line on the Hudson river, and about thirteen acres of land are owned by the company in the vicinity, part of which will include the wharves which are now constructing for the accommodation of the transportation on the road. The road crosses South Pearl street, under a handsome stone arch, and passes thence up the hill with an inclination of one foot in eighteen, until it reaches the summit, 185 feet above the Hudson. At this place a building is erected which contains a double stationary engine of twelve horse power, for hauling up the cars. The road then proceeds north-westerly up to the head of Lydius street, to strike which it takes a curve of 4000 feet radius, and passes over two heavy and high embankments, and through some deep cuttings near the alms-house. From the head of Lydius street (where the travel at present terminates), it proceeds in the same direction, crossing the heavy embankment called the Buel viaduct, ascending a plane for about three miles, of one foot in 225. Afterwards ascending by two other planes at different points, and crossing several waterways, upon embankments, it proceeds to the summit at Schenectady. There are in all six principal embankments. About four miles from Schenectady there is a curve in the road of 23,000 feet radius. Just at the summit is a smaller curve, with a radius of 1100 feet. There is also another plane of three miles, where the ascent is one foot in 270; and another of one and a half mile, where it is one in 450 feet. The descent from the Schenectady summit to the level of the Hudson is 335 feet. At this point a double stationary engine is placed. A plane overcomes a height of 115 feet, with an inclination like that near the Hudson, and, running down a heavy embankment, strikes the canal about half a mile from the principal street in Schenectady; but the track is prolonged upon a level to within sixty rods of the same. The soil through which the road passes is sandy. Some considerable elevations are cut through, and several ravines crossed. The slopes left by the cutting, or formed by the embankments, are to be covered with sods. No settling of the road has taken place, except to a very slight degree in some of the embankments, which may be easily rectified. The road was constructed in the following manner:—After the grading is finished, under each line of the rails, square holes are dug at the distance of three feet from centre to centre, capable of containing nine cubic feet of broken stone. In clay, the holes are connected by a neck. In these holes the broken stone is placed and rammed down, so as to form a solid mass. The stone, which is principally grauwacke, is broken into pieces that will pass through a ring of two inches diameter. On this foundation, stone blocks, dressed upon the upper side only, are placed. The next step is to drill the holes in the face of the stone. In these drillings, small plugs of locust wood, about four inches long and about an inch in diameter, are loosely placed. Into these plugs are driven the iron spikes which pass through and hold down the cast iron chairs. The chairs are double or single. The double chairs are of sufficient length to pass across, beneath the rail, and are used in the proportion of one to three single chairs, which are on each side of the rail, but do not pass under it. The rails are of wood, from twenty-one to twenty-four feet long and six inches square, hewed out of Norway and white pine. These rails are placed in the iron chairs, and are wedged with wooden wedges, on the outer side, into a perfectly true line. On these lie the iron rails, which are made of wrought iron. They are two inches and a half wide at the bottom, and rounded off to 1 7-8ths on the top; their thickness is 9-16ths of an inch. These bars are tongued and grooved, and are secured to the wooden rail by iron spikes driven through oval openings. The expansion and contraction of the metal are provided for in these openings, and also by the tongues and grooves. Where two bars join an iron plate is placed underneath; and it is remarked that, although additional strength is gained by this, yet the iron rails wear faster at these places than at any others. At the distance of twenty-one feet, tie pieces, as a further security, are laid down to bind the rails to each other, and to keep them in their proper position. Broken stone is also laid down between the rails, and at the sides of the road. Upon the embankments, the rails are laid without stone blocks, which are proposed to be put down after the earth has settled. The other track, which is on the south side of the one now in use, is in a state of active preparation. Both locomotive engines and horses are used upon this road. A locomotive has travelled upon it with a load of eight tons, at the rate of thirty miles per hour. The number of passengers in October, 1831, averaged 387 per day. The *Schenectady* and *Saratoga railroad*. This railroad extends from Schenectady to Ballston, and thence to Saratoga. The route is admirably adapted for railroad purposes. There is no inclination greater than one foot in 400. The execution of this work was undertaken by an incorporated company, with a capital stock of 180,000 dollars. The total income is estimated at 72,000 dollars, and the net revenue at 51,000 dollars. This railroad was commenced in the summer of 1831. The *Ithaca* and *Susquehanna railroad*. The legislature of New York have authorized the construction of a railroad from Ithaca, near the south end of Cayuga lake, to the Susquehanna river, at Owego. The distance is about twenty-eight miles. The *Ithaca* and *Catskill railroad* is to extend from Ithaca to Catskill, on the Hudson. The distance is about 167 miles. The *Catskill* and *Canajoharie railroad*. This railroad extends from Catskill, on the Hudson, to Canajoharie, on the Mohawk, a distance of seventy-five miles. It was commenced in 1831, in the vicinity of Catskill. The *Harlem railroad* extends from Harlem river to the city of New York, a distance of about five miles. It is purposed that the contemplated railroad from New York to Albany, running near the boundary line of the state of New York, commence at the northern termination of this railroad. Railroads have been projected, extending from Schenectady to Buffalo, passing through Utica and Salina; from some point opposite the city of New York, through the southern counties of the state, by the way of Owego, and through the valleys of the Susquehanna and Chemung rivers, to lake Erie, at some point between Cattaraugus creek and the Pennsylvania boundary line; from the city of New York to Albany, passing on the eastern side of the Hudson, as already mentioned, with branches to Litchfield in Connecticut, and to Berkshire county in Massachusetts; from Utica to the Pennsylvania boundary line; from Buffalo to the Pennsylvania line; from Rochester to the Alleghany river; from the Catskill and Canajoharie railroad to the Susquehanna river; from Buffalo to the Cayuga lake; from Utica to the Cayuga lake; from Utica to Oswego; from Geneva to Ithaca; from Copperstown to Clairsville; from Rochester to Carthage; from Rochester to Danville; from Troy to Whitehall; from Jamaica to Brooklyn; from Whitehall to the Vermont line, &c. &c. The *Camden* and *Amboy railroad* commences at Camden, on the Delaware, opposite to Philadelphia, and passes through Burlington, Bordentown, Highstown, Spottswood, over South river, and terminates at Amboy. The whole distance from Camden to Amboy, in a direct line, is sixty miles; by the railroad the distance is sixty-one miles and ten chains. The country through which it passes is very level. Between Bordentown and Amboy, there is a cut sixty feet deep at the deepest point, extending nearly two miles, with varying depth. The soil taken from the excavation has been, with great labour, placed on the top of the banks, there being no valleys near, to be filled up. The culverts and viaducts, in the vicinity of Bordentown, are constructed of stone. The embankments are sodded, which is necessary from the light nature of the soil. The binding gravel used upon this railroad was formed by grinding the small and smooth stone found under the soil, in a steam mill constructed for this purpose. It is calculated that 500,000 dollars per annum will be received for the conveyance of light freight and passengers. The expense of a single track, that is, two lines of rails, was estimated at 8000 dollars per mile. The execution of this enterprise was undertaken by the Camden and Amboy railroad company, united, in pursuance of an act of the legislature of New Jersey, to the Delaware and Raritan canal company. The company having been incorporated for the purposes of transportation as well as for constructing the railroad, preparations have been made for fulfilling that part of their obligations, by the purchase of the line of steamboats on the Delaware and Raritan, &c. As the Delaware is frequently closed with ice during a part of the winter, and the trade of Philadelphia is, in consequence, directed to New York, it is supposed that vessels destined for Philadelphia may put into Raritan bay, which is open at all seasons, and that the cargoes may be thence conveyed at once upon the railroad to the place of their destination. In order to secure this object, the company has purchased large lots on the Raritan and the Delaware, for the convenience of ships, steam-boats, &c., and it is believed that steam-boats can be so constructed as to cross the Delaware between Camden and Philadelphia, at all seasons of the year. The *Patterson* and *Hudson river railroad* extends from Patterson, on the Passaic, to Jersey city and the Hudson river, opposite New York, fourteen miles. After the expiration of fifty years, from the year 18[illegible], the state of New Jersey has a right to take the same at an appraised value. The *Elizabethtown and Somerville railroad* extends from Elizabethtown to Somerville. It was undertaken by the Elizabethtown and Somerville railroad company, incorporated by the legislature of New Jersey in 1830, [illegible], with a capital stock of 200,000 dollars, with liberty to increase it to 400,000 dollars. The *West Jersey railroad* and transportation company was also incorporated at the same session, with a capital stock of 500,000 dollars, with liberty to increase it to 2,000,000 dollars. The object of the company is the construction of a railroad from the Delaware river in the county of Gloucester, or from some point on the Camden and Amboy railroad to some point on the same river, in the township of Penns Neck, in the county of Salem. A charter was also granted to a company to construct a railroad connecting the Morris canal with the Patterson and Hudson river railroad. The *Mauch Chunk railroad* was the first railroad constructed in Pennsylvania. It was commenced in January, 1827, and finished on the succeeding May. It extends from the coal mines near Mauch Chunk, along the side of the mountain, down an inclined plane of various declivities to the Lehigh river. The elevation of the coal mines above the Lehigh, at the point where the coal is delivered into the boats, is 936 feet. The road within half a mile of the mine, rises 46 feet, when it reaches its extreme point of elevation, 982 feet above the water. At the bank of the river there is an abrupt termination of the mountain, upon which is constructed an inclined plane 700 feet long, with a declivity of [illegible] feet, below which there is still a farther descent of 25 feet down a chute, through which coal is conveyed into the boats. Its entire length, from the river to the mines, is nine miles, and its branches to the ends, and the sidelings, four and a half miles more. It consists of a single track. The least radius of curvature is 437 feet. The railroad has a continued descent from the summit, so that the cars descend by their own gravity. The rails are of timber, covered with plates of iron, and resting on cross sleepers, at the distance of four feet from each other. The coal is transported in cars, fourteen of which are connected together, each containing a ton and a half of coal. A single conductor rides on one of the cars, and regulates their movement. From 300 to 340 tons a day are regularly discharged into the river. The empty wagons are drawn back by mules, who ride down the railway in cars; and so strong is their preference of this mode of travelling down, that, in one instance, when they were sent up with the coal wagons without the cars, the workmen were not able to drive them down, but were actually obliged to drag up the cars for them to descend in. At first the wagons descended at the rate of fifteen or twenty miles an hour; but it was necessary to reduce the speed, as it injured the machines, and by agitating the coal, involved the driver in a cloud of dust. The cost of this railroad was 3050 dollars per mile. The *Mount Carbon railroad* company was incorporated in the spring of 1829, and the railroad was begun in the succeeding October. It commences at mount Carbon. At the termination, the road is elevated upon thirty-one piers of masonry erected upon the landings. The road passes thence through the gap of Sharp mountain, following the valley of the Schuylkill to Morrisville. It here leaves the Schuylkill at its junction with the Norwegian creek, stretching up the valley of the latter, and crossing it several times; hence it runs directly through Pottsville to the Forks, a distance of 6208 feet from the piers. The east branch is 14,200 feet in length. It passes through the Peach mountain tract, and terminates upon the Flowery Field tract, &c. The west branch commences at Marysville, and is 16,400 feet in length. This railroad has a width of eighteen feet surface, occupied by a double track from the head of both branches to the commencement of the piers at mount Carbon, where a third track is added. The iron plates on which the wheels run, are two inches wide by three-eighths in thickness, beveled on the edge and having the nail-holes countersunk, the beads being trimmed off, to prevent jarring. The cost of this railroad was 100,000 dollars. The *Schuylkill valley railroad* commences at Port Carbon, and terminates at Tuscarora, a distance of ten miles. There are fifteen lateral railroads intersecting it, the distances of which combined, amount to about thirteen miles. The main stem consists of a double track. The laterals have but a single track. The cost of the main stem was 5500 dollars per mile; that of the laterals, 2600 dollars per mile. The *Schuylkill railroad* is thirteen miles in length, consists of a double track, and cost 7000 dollars per mile. The *Mill creek railroad* commences at Port Carbon, and extends up Mill creek four miles. This road consists of a single track, and cost about 14,000 dollars. There are about three miles of lateral railroads, intersecting the main stem, which cost about 2000 dollars per mile. The *West Branch railroad* commences at Schuylkill Haven, and terminates at the foot of the Broad mountain. The length of the road, including the west branch, is fifteen miles. The main stem has a double track; the cost was upwards of 150,000 dollars. There are also about five miles of lateral road intersecting it, which consist of a single track; the average cost of the laterals was about 2000 dollars per mile.

The *Pinegrove railroad* extends from the mines to the Swatara feeder, a distance of five miles. This road cost about 30,000 dollars.

The *Little Schuylkill railroad* commences at Port Clinton, and extends up the stream to the mines, at Tamaqua, a distance of about twenty-three miles.

The *Lackawaxen railroad* commences at the termination of the Lackawaxen and Delaware and Hudson canal, and connects that canal with the coal bed in Carbondale. It is sixteen miles in length, and overcomes an elevation of 800 feet. This rise is surmounted by five inclined planes, in three and a half miles, each from 2000 to 3000 feet in length. The cars are drawn up by stationary engines. The railroad consists of a single track of wooden rails, capped with iron. The cost was 6500 dollars per mile.

The *Alleghany portage railroad* is intended to connect the eastern and western sections of the Pennsylvania canal, and complete the direct line of communication between Philadelphia and Pittsburg. The route adopted commences at Frankstown, and, leading upwards along the valley of Blair's gap run, crosses the Alleghany mountains at Blair's gap summit, and descends in the valleys of Laurel run and the Little Conemaugh to Johnstown, a distance of thirty-eight and a half miles, or in a right line of nearly thirty and three fourths miles. The summit is 1397 feet above Frankstown, and 1137 feet above Johnstown, and is to be surmounted by means of eleven inclined planes, six of which are to be on the eastern, and five on the western side of the mountains. The sections between the inclined planes are graduated at an inclination not exceeding thirty feet per mile, and the curvatures are generally limited to a radius of 603 feet, except in four instances; the most abrupt curvature has a radius of 410 feet. The cost of the entire route was estimated at 612,000 dollars. This railroad is constructed by the state of Pennsylvania. In March, 1831, an appropriation of 700,000 dollars was made for the construction of this railroad, and the extension of the Juniata division of the Pennsylvania canal from Huntingdon to Hollidaysburg, about two and a half miles beyond Frankstown.

The *Central railroad* extends from Pottsville down the valley of the Shamokin creek to Sunbury, which is near the junction of the Susquehanna with its western branch.

The *West Chester railroad* leads from the borough of West Chester, which is twenty-three miles west of Philadelphia, to Paoli, where it joins the Philadelphia and Columbia railroad.

The *Philadelphia, Germantown and Norristown railroad* is about nineteen miles in length, extending from Philadelphia to Norristown, on the Schuylkill.

The *Philadelphia and Delaware county railroad* extends from Philadelphia south-westerly, along the western margin of the river Delaware.

The *Philadelphia and Columbia railroad* is intended to connect the Delaware navigation at Philadelphia with that of the Susquehanna at Columbia, passing through the counties of Delaware, Chester and Lancaster. The principal summit on this railroad is the Mine ridge, which is 599 feet above the Delaware at Philadelphia. There are two inclined planes, one at Columbia, which is 660 yards in length and ninety feet in height, and the other, which is 180 feet in height, at the Schuylkill, near Peter's island, in the vicinity of Philadelphia. At the foot of the latter inclined plane, the Schuylkill is to be crossed by a bridge 900 feet in length, which is now constructing. From the Mine ridge gap summit, at Henderson, westward, to the head of the inclined plane at Columbia, the distance is twenty-nine miles, and the ascent and descent is 848$\frac{1}{2}$ feet. From the same summit, eastward, to the head of the inclined plane at the Schuylkill, the distance is fifty miles, and the ascent and descent 940 feet. The whole length is 82$\frac{3}{4}$ miles. It terminates in Philadelphia at the intersection of Vine and Broad streets. The sum of 600,000 dollars was appropriated by the legislature of Pennsylvania, in March, 1831, towards the completion of this work. It has been stated that in 1832 the whole number of railroads in Pennsylvania, of greater or less extent, is sixty-seven.

The *Newcastle and Frenchtown railroad* extends from Newcastle, on the Delaware, to the Elk river, near Frenchtown. It consists of a single track, with the requisite number of turn-outs, and is nearly sixteen and a half miles in length, and is only 853 yards longer than a perfectly straight line drawn between its *termini*. It consists of six curves and six straight lines. The curves vary in length from 1939 feet to 8296 feet. The *radii* of the three smallest curves is 10,560 feet; the radius of the largest curve is 20,000 feet. The graduation of the road varies from a perfect level to ascents and descents of ten feet six inches to sixteen feet four inches, to the mile; at one place, for about 4000 feet, the slope is at the rate of twenty-nine feet to the mile. The whole amount of excavation is about 500,000 cubic yards of earth, exclusive of the side drains. The amount of embankment is about 420,000 cubic yards. The total cost of the railroad, including the land for its location, wharves, and depots at both ends, locomotives, &c., was estimated at 400,000 dollars.

The *Baltimore and Susquehanna railroad* was commenced in 1830. It extends from Baltimore to York. A distance which in consequence of the uneven surface of the country, will not be less than seventy-six miles.

The *Baltimore and Ohio railroad* is intended to unite the city of Baltimore, a central point on the Atlantic coast, with the Ohio river—the great navigable highway of the Western States. The ceremony of laying the first stone was performed on the 4th of July, 1828; but it was not until the autumn of that year that active operations towards the construction of the work were begun. It commences at the head of the basin in Baltimore. The railroad in the city is a single track, the rails of which are placed at equal distances between the curb stones of the side walks, and consists of blocks of stone, sunk as low as the level of the street, with grooves in them for the flanges of the wheels, to run with an iron bar for the track, secured in the mode adopted on other parts of the road. The whole street is paved, and is slightly convex. On this part of the road, horse power alone is to be used. From the basin the railroad passes to the depot in Pratt street. The line between Pratt street and the Potomac is sixty-seven and five eighths miles in length. The Carrollton viaduct over Gwyn's falls is constructed of granite. The whole exterior is hewn. It consists of two arches, and is 312 feet in length. Its height, from the foundation to the top of the parapet, sixty-three feet nine inches; from the surface of the water to the top of the parapet, fifty-one feet and nine inches. The width of the railway travelling path is twenty-six feet six inches; the chord of the arch, springing from the abutments, eighty feet three inches. It is a structure of great solidity and beauty. The bridge across the Patapsco is also of stone, and consists of two arches, of fifty-five feet span each and two of twenty feet span each. It is 375 feet in length. There are also several extensive embankments and deep cuts. The ridges, culverts, &c., contain, altogether, 47,300 perches of masonry. The cost for graduation and masonry was 605,912 dollars. At the Forks of the Patapsco, the road reaches an elevation of nearly 300 feet above tide. The lateral road to Frederick commences near the western end of the bridge over the Monocacy, and, pursuing the western margin of the river upward for about one mile, diverges from it to the north-west, and, after crossing the land between that river and Caroll's creek, terminates at the depot at Frederick. The length of this branch is three miles 130 poles. The estimated cost of graduating the entire line of the main road between Baltimore and the Point of Rocks, including the lateral road to Frederick, and of laying a double set of tracks upon the main stem, and a single set on the lateral road, is 1,906,853 dollars, or 27,128 dollars per mile. From Jan. 1, to Sep. 30, 1831, the number of passengers on that portion of the road between Baltimore and Ellicott's mills was 81,905; and within the same period, [illegible] tons have been transported upon it, yielding an income of 31,405 dollars and involving an expenditure of 10,994 dollars. Transportation is effected by horses and by steam locomotives.

The *Baltimore and Washington railroad* is a branch of the Baltimore and Ohio railroad, and its execution was undertaken by the Baltimore and Ohio railroad company. The length from the point of its intersection with the main stem, near Elkridge landing, to Washington, will be about thirty-three miles.

The *Manchester railroad* is in Chesterfield county, Virginia. It extends from Manchester to the coal mines. It consists of a single track, and is thirteen miles in length.

The *Petersburg and Roanoke railroad* was undertaken to counteract the injurious effect which the Dismal Swamp canal has upon the trade of Petersburg.

The *Charleston and Hamburg railroad* extends from Charleston to Hamburg, on the Savannah river, opposite Augusta. It consists of two divisions: the eastern division, from Charleston to Edisto river, is sixty-two and a half miles in length; the western division, from Edisto to Hamburg, is seventy miles in length. The road is constructed of wood, with tracks of iron, and is designed for steam locomotives. This enterprise was undertaken by the South Carolina canal and railroad company, which has, however, received pecuniary assistance from the state of South Carolina. A second railroad, of about the same length, is also embraced within the objects of the company. It is to extend from Charleston to Columbia.

The *Lexington and Ohio railroad* was commenced in 1831. It is to extend from Lexington to Frankfort, and thence to the Ohio river just below the falls, near Shippingport, which is distant two miles from Louisville. It will be about eighty miles in length. The Louisville canal, round the falls of the Ohio, terminates also at Shippingport. The Lexington and Ohio railroad company, by which this enterprise is undertaken, was incorporated by the legislature of Kentucky, in 1830, with a capital stock of 1,000,000 dollars.

The *Tuscumbia railroad* was constructed in order to avoid the Muscle shoals, and extends from Tuscumbia to Decatur. It was commenced in [illegible]. It consists of a single track of rails, and cost about 3500 dollars per mile. It is also proposed to extend the Lynchburg and New river railroad to Knoxville. Railroads have also been projected from Nashville to Franklin, and from Columbia to the Tennessee.

The *lake Pontchartrain railroad* is about [illegible] miles and a half in length, and extends from lake Pontchartrain to New Orleans. It consists of a single track. It is perfectly straight, and nearly level, the ascent and descent being only [illegible] inches. The cost was 15,000 dollars per mile. The company, by which it was constructed, was incorporated, in January, 1830, with exclusive privileges for twenty-five years. The road was finished and opened on April 16, 1831. The company have constructed an artificial harbour and breakwater in the lake, at the termination of the railroad. The port is called *Port Pontchartrain*.

RAIN. This meteorological phenomenon depends upon the formation and dissolution of clouds. The humidity suspended in the atmosphere is derived from the evaporation of water, partly from land, but chiefly from the vast expanse of the ocean. A surface of lake, of pasture, cornfield or forest [illegible] ports a continual evaporation, augmented only by the dryness of the air, and the rapidity of its successive contacts. Even ploughed land will supply nearly as much moisture to the atmosphere as a sheet of water of equal dimensions. If the whole of the waters, which fall from the heavens, were to return again, the evaporation from the ground might be sufficient alone to maintain the perpetual circulation. But more than one third of all the rains and melted snows are carried by the rivers to the to the ocean, which must hence restore this continued waste. The air, in exhaling its watery store, is rendered quite damp; but it may afterwards become dry, on being transported to a warmer situation. Such is the case with the sea-breeze, particularly in summer. It arrives on the shore cold and moist; but as it advances into the interior of the continent, it grows milder and drier. The moisture deposited by a body of air in minute globules, which remain suspended or subside slowly in the atmosphere, constitutes a *cloud*. When it comes near us, whether it hovers on the tops of the hills or spreads over the valleys, it receives the name of a *fog*. The production of rain has, from the earliest times, engaged the attention of philosophers; but it was reserved for doctor James Hutton, of Edinburgh, to afford the true solution of the problem. His theory of rain was made known in 1787; since which period it has been greatly neglected by writers upon meteorology, until within a very few years. We shall now give an outline of doctor Hutton's views. Air, in cooling, it is known, has the property of depositing the moisture it contains. But how, it may be asked, is it cooled in the free atmosphere, unless by the contact or commixture of a colder portion of the same fluid? Now the portion of air which is chilled must, in an equal degree, warm the other. If, in consequence of this mutual change of condition, the former be disposed to resign its moisture, the latter is more inclined to retain it; and, consequently, if such opposite effects were balanced, there could on the whole be no precipitation of moisture. The separation of moisture, on the mixing of two masses of damp air at different temperatures, would therefore prove, that the dissolving power of air suffers more diminution from losing part of the combined heat, than it acquires augmentation from gaining an equal measure of it; and, consequently, this power must, under equal accessions of heat, increase more slowly at first than it does afterwards, thus advancing always with accumulated celerity. The quantity of moisture which air can hold, thus increases in a much faster ratio than its temperature. This great principle in the economy of nature was traced by doctor Hutton from indirect experience. It is the simplest of the accelerating kind, and perfectly agrees with the law of solution, which the hygrometer has established. Suppose equal bulks of air in a state of saturation, and at the different temperatures of fifteen and forty-five centesimal degrees, were intermixed; the compound arising from such union will evidently have the mean temperature of 30°. But since, at these temperatures, the one portion held 200 parts of humidity, and the other 800, the aggregate must contain 1000 parts, or either half of it, 500; at the mean or resulting temperature, however, this portion is only capable of suspending 400 parts of humidity, and, consequently, the difference, or 100 parts, amounting to the two hundredth part of the whole weight of air, must be precipitated from the compound mass. In this example, it has been assumed that the portions of differently heated air were saturated with moisture before mixing; but it is only required that they should approximate to this condition. The effect, however, of simple commixture would, in most cases, be very small. To explain the actual phenomena, we must have recourse to the mutual operation of a chill and of a warm current driving swiftly in opposite directions, and continually mixing and shifting their surfaces. By this rapidity, a larger volume of the fluid is brought into contact in a given time. Suppose, for instance, the one current to have a temperature of 50°, and the other that of 70° Fahr.; the blending surfaces will therefore assume the mean temperature of 60°. Consequently the two streams throw together 200 and 334.2 parts of moisture, making 567.1 parts for the compound, which, at its actual temperature, can hold only 258.6 parts; the difference, or 8.6 parts, forms the measure of precipitation, corresponding to the 2325th of the whole weight of the commixed air. It would thus require a column of air thirty miles in length to furnish, over a given spot, and in the space of an hour, a deposit of moisture equal to the height of an inch. If the sum of the opposite velocities amounted to sixty miles an hour and the intermingling influence extended but to a quarter of an inch at the grazing surfaces, but there would still, on this supposition, be produced, in the same time, a fall of rain reaching to half an inch in altitude. These quantities come within the limits of probability, and agree sufficiently with experience and observation. But in the higher temperatures, though the difference of the heat between the opposite strata of air should remain the same, the measure of aqueous precipitation is greatly increased. Thus, while the mixture of equal masses of air, at the temperatures of 40° and 60°, is only 6.6, that from a like mixture of 80° and 100° amounts to 19. This result is entirely conformable to observation, for showers are most copious during hot weather and in the tropical climates. The quantity of rain precipitated from the atmosphere thus depends upon a variety of circumstances,—on the previous dampness of the commixed portions of the fluid,—their difference of heat,—the elevation of their mean temperature,—and the extent of the combination which takes place. When the deposition is slow, the very minute aqueous globules remain suspended, and form clouds; but if it be rapid and copious, those particles conglomerate, and produce, according to the temperature of the medium through which they descend, rain, mist, snow, or hail. The foregoing theory tallies precisely with what we experience in the connexion of rains with the variable nature of the winds. Steady dry weather is always accompanied by a steady direction of the wind; whereas, in rainy weather, the winds are unsteady and variable. The heavy rains that fall in India always take place during the shifting of the monsoons; and while they last, the winds are always veering.—The annual quantity of rain is greatest at the equator, and gradually diminishes as we approach the pole. This will be evident from the following table, showing the annual depth of rain in different latitudes:

	Lat. N.	*Fall of Rain.*	
Grenada,	12°	126	inches.
Cape Françoise,	19° 46'	120	"
Calcutta,	22° 23'	81	"
Rome,	41° 54'	39	"
England,	50° to 55°	31	"
Petersburg.	59° 16'	16	"
Uleaborg	65° 1'	13½	"

On the contrary, the number of rainy days is smallest at the equator, and increases in proportion to the distance from it. From north latitude 12° to 43°, the mean number of rainy days is 78.

From 43° to 46° the mean number is 103
" 46° " 50° . . . 134
" 50° " 60° . . . 151

Hence it is obvious that the rain falls in very heavy showers in warm climates, and that it becomes more and more gentle as we advance towards the pole. Consequently, in hot climates, the air must be much less loaded with moisture, and the rate of evaporation much greater than in cold climates. For when rain falls very heavy, a great portion of it runs off by the surface, and flows into the sea. But this happens to a much less extent when the fall of rain is more gentle.

RAINBOW. To what has been said on this subject in the article *Optics* we will only add, that in a stormy sea, in which the water is frequently sent up into the air in large drops, the rays of the sun form in them inverted rainbows, of which from twenty to thirty are frequently visible at the same time. They usually have but two colours; yellow upon the side towards the sun, and pale green upon the other side. The appearance of two rainbows, intersected by each other, which sometimes takes place on the seacoast, when the rain-cloud is over the water, is perhaps the effect of the image of the sun reflected from the surface of the water. In the morning, we often see the colours of the rainbow in the dew-drops on the meadows, where the bow is hyperbolical or elliptical. Rainbows likewise have sometimes been observed in the night, which arise from the refraction and dispersion of the coloured rays of the moon in the drops of rain; they are, however, very faint, and usually form only white and yellow bows. The bishop of Spalatro, Antony de Dominis, gave the first accurate explanation of the principal rainbow, in a treatise which appeared at Venice in the beginning of the seventeenth century; but we are indebted to Newton for the complete elucidation, on mathematical principles, of this bright appearance of the heavens (*Optica*, London, 1706, quarto). See *Iris*.

RAINGUAGE, OR PLUVIOMETER; a machine for measuring the quantity of rain that falls. There are various kinds of rainguages: one of the best is a hollow cylinder, having within it a cork-ball attached to a wooden stem, which passes through a small opening at the top, on which is placed a large funnel. When this instrument is placed in the open air, in a free place, the rain that falls within the circumference of the funnel will run down into the cylinder, and cause the cork to float; and the quantity of water in the cylinder may be seen by the height to which the stem of the float is raised. The stem of the float is so graduated as to show, by its divisions, the number of perpendicular inches of water which fell on the surface of the earth since the last observation. It is hardly necessary to observe that, after every observation, the cylinder must be emptied. A very simple rainguage, and one which answers all practical purposes, consists of a copper funnel, the area of whose opening is exactly ten square inches. This funnel is fixed in a bottle, and the quantity of rain caught is ascertained by multiplying the weight in ounces by 173, which gives the depth in inches and parts of an inch. In fixing these guages, care must be taken that the rain may have free access to them. Hence the tops of buildings are usually the best places. When quantities of rain, collected in them at different places, are compared, the instruments ought to be fixed at the same heights above the ground at both places, because, at different heights, the quantities are always different, even at the same place. See *Rain*.

RAJAH; the hereditary princes of the Hindoos, who, before the subjugation of the country by the Moguls, governed the various countries of Hindostan, as they still continue to do in some instances, though they are generally dependent on the Europeans. They belong to the caste of Cashatriya, or Chehteree. (See *Caste*, and *Hindoos*.) In the East Indian islands, especially in the interior of them, where the arms of foreign conquerors have never penetrated, there are yet many independent rajahs. The following cut represents an Indian rajah, seated with his two attendants behind.

Rajah is the prefix to many geographical names in the East Indies.

RAJASTHAN (or the central and western Rajpoot states) extends from 22° to 30° north latitude, and from 69° to 78° east longitude, comprising 350,000 square miles. It consists of seven states, belonging to the British dominions. This country was comparatively but little known to Europeans, until the publication of a valuable work on it by colonel Tod, who had been for a long time in authority there. The work is of much interest to the geographer, the historian, the lover of poetry, and the linguist, and brings to light curious traces of institutions similar to those of Europe. Were other remote countries of the East explored in the same spirit, many more such analogies would probably be found. See the *Annals and Antiquities of Rajasthan, by Lieut. Col. James Tod, late Political Agent to the Western Rajpoot States* (4to, London, 1829).

RAJPOOTANA. See *Rajasthan*.

RAKE; a term applied to the masts when they are out of a perpendicular situation; as, That ship's mainmast *rakes* aft.

RAKING; the act of cannonading a ship on the stern, or head, so that the balls range the whole length of the decks, which is one of the most dangerous incidents that can happen in a naval action. This is frequently called *raking fore and aft*, and is similar to what is termed by engineers *enfilading*.

RALEIGH, OR RALEGH, SIR WALTER, a distinguished warrior, statesman, and writer, in the reigns of Elizabeth and James I., was the second son of a gentleman of ancient family in Devonshire. He was born in 1552, in that county, and was sent to Oriel college, Oxford, where his proficiency gave a high opinion of his capacity. His active disposition and martial ardour led him, at the age of seventeen, to join a body of gentlemen volunteers raised to assist the French Protestants. He subsequently accompanied the forces sent under general Norris to assist the Dutch, and afterwards accompanied his half-brother Sir Humphrey Gilbert in a voyage to Newfoundland. On his return, he distinguished himself in the Irish rebellion, and was rewarded for his services by a considerable estate in Ireland. His favour at court was advanced by a well-known act of gallantry. The queen, in a walk among a crowd of courtiers, having come to a spot in which the path was obstructed by mire, Raleigh immediately took off his rich plush cloak, and spread it on the ground for a foot-cloth. In 1584, his active disposition was manifested in a scheme for the discovery and settlement of those parts of North America not already appropriated by Christian states. By his interest, he obtained a very extensive patent for this purpose; and, with the help of friends, two ships were fitted out. These vessels having carried home cargoes that sold well, a second expedition of seven vessels followed, under the command of Sir Richard Grenville, Raleigh's kinsman. The latter enterprise terminated in the settlement of Virginia, so called in honour of queen Elizabeth, and is said to have first introduced tobacco and potatoes to Europe. In the mean time, he was honoured with knighthood, and rewarded by several lucrative grants, including a large share of the forfeited Irish estates. He was one of the council to whom the consideration of the best means of opposing the Spanish armada was intrusted, and was among the number of volunteers who joined the English fleet with ships of their own. In 1589, he accompanied the expelled king of Portugal in his attempt to reinstate himself, for which service he received several additional marks of favour and emolument; for, although fond of glory, he was almost equally so of gain. On his return from Portugal, he visited Ireland, and contracted an intimacy with Spenser, who celebrated Sir Walter under the title of the Shepherd of the Ocean, and to his Faery Queen prefixed a letter to him explanatory of its plan and design. The latter, in return, introduced the poet to Elizabeth. In 1592, he commanded an expedition with a view of attacking Panama; but was recalled by the queen, and, soon after, incurred her displeasure by an amour with one of her maids of honour, the daughter of Sir Nicholas Throckmorton. Although he made the best reparation in his power, by marrying that lady, he was imprisoned for some months, and banished the queen's presence. To recover favour, he planned an expedition to Guinna, in which he embarked in February, 1595, and reached the Orinoco; but was obliged, by sickness and contrary winds, to return, after having done little more than taken a formal possession of the country in the name of Elizabeth. In 1596, he had so far regained favour that he had a naval command under the earl of Essex, with whom a difference ensued, that laid the foundation of a lasting enmity between them. Sir Walter was subsequently fully restored to the good graces of Elizabeth, who nominated him to the government of Jersey. He witnessed the ruin of his antagonist, the earl of Essex, whose execution he urged, and personally viewed from a window in the armoury. (See *Devereux*.) The speedy death of the queen, which this very catastrophe hastened, put a period to his prosperity. James I., whom, with some other courtiers, he sought to limit in his power of introducing the Scots into England, resented that attempt, and disliked him as the enemy of his friend the earl of Essex. Although received with external civility at court, he was deprived of his post of captain of the guards, and evidently discountenanced. This treatment preyed upon his high spirit; and, a conspiracy having been formed for the purpose of placing upon the throne the lady Arabella Stuart, Sir Walter was accused of participating in it by lord Cobham, to whose idle proposals he had given ear, without approving them. By the base subservience of the jury, he was brought in guilty of high treason, even to the surprise of the attorney-general Coke himself, who declared that he had only charged him with misprision of treason. Raleigh was reprieved, and committed to the Tower, where his wife, at her earnest solicitation, was allowed to reside with him, and where his youngest son was born. Though his estates, in general, were preserved to him, the rapacity of the king's minion, the infamous Car, seized on his manor of Sherborne, upon a flaw found in his prior conveyance of it to his son. It was not until after twelve years' confinement that he obtained his liberation, during which interval he composed the greater part of his works, and especially his History of the World. He was only released, at last, by the advance of a large sum of money to the new favourite Villiers (see *Buckingham*); and, to retrieve his broken fortunes, he planned another expedition to America. He obtained a patent under the great seal for making a settlement in Guiana; but, in order to retain a power over him, the king did not grant him a pardon for the sentence passed upon him for his alleged treason. How far Raleigh knowingly deceived the court by his representations of rich discoveries, and gold mines, it is impossible now to ascertain; but, having reached the Orinoco, he dispatched a portion of his force to attack the new Spanish settlement of St. Thomas, which was captured, with the loss of his eldest son. The expected plunder, however, proved of little value; and Sir Walter, after having, in vain, attempted to induce his captains to attack other Spanish settlements, arrived at Plymouth in July, 1618. In the mean time, the Spanish ambassador had produced such an effect upon James (see *James I*), who was seeking the hand of the Infanta for his son Charles, that Raleigh was arrested, and committed to the Tower. James had reason to be offended with the conduct of Raleigh against a power in amity with himself, and might have tried him for this new offence; but, with his usual meanness and pusillanimity, determined to execute him on his former sentence. Being brought before the court of king's bench, his plea of an implied pardon by his subsequent command was overruled; and, the doom of death being pronounced against him, it was carried into execution the following day (October 29, 1618), in Old Palace-yard. His behaviour at the scaffold was calm; and, after addressing the people at some length in his own justification, he received the stroke of death with perfect composure. Thus fell sir Walter Raleigh, in the sixty-sixth year of his age, by one of the most odious acts of the disgraceful reign of James I. As a politician and public character, this eminent person is open to much animadversion; but, in extent of capacity and vigour of mind, he had few equals, even in an age of great men. His writings are on a variety of topics, poetical, military, maritime, geographical, political, and historical. Most of his miscellaneous pieces have ceased to be interesting, but his History of the World is one of the best specimens of the English of his day, being at once the style of the statesman and the scholar. The compass of the work did not admit fulness of narrative, but he is often an acute and eloquent reasoner on historical events. The best edition is that of Oldys (1736, 2 vols., fol.). Of his miscellaneous works, an edition by Doctor Birch was published in 1748, in two volumes, octavo.

RALLENTANDO, ALSO **RITARDANDO**, OR **LENTANDO** (*Italian*), in music, indicates that the time of the passage over which it is written, is to be gradually retarded.

RALPH, James, a native of Philadelphia, in North America, came to England as a literary adventurer in 1725, in company with Benjamin Franklin. In 1728, Ralph published a poem, entitled "Night," to which Pope thus alludes in the Dunciad:

> "Silence, ye wolves, while Ralph to Cynthia howls,
> Making night hideous,—answer him, ye owls!"

He afterwards attempted the drama, but without success; and having produced a tragedy, a comedy, an opera, and a farce, he took up the employment of a party writer. In 1742, he published an Answer to the Memoirs of Sarah, Duchess of Marlborough; and in 1744, appeared his History of England, during the reigns of Charles II., James II., William III, &c., (2 vols., folio), which, as a work of research, is by no means destitute of merit. He was at length connected with the politicians and literary men who were attached to the service of Frederic, prince of Wales; in consequence of which, Ralph is said to have become possessed of a manuscript written by the prince, or under his direction, to which so much importance was attributed, that a gratuity or a pension was bestowed on the holder, as a compensation for surrendering it. He obtained a pension after the accession of George III., but he did not long enjoy it, as his death took place in 1762. Besides the works mentioned, he published a treatise on the Use and Abuse of Parliaments (2 vols., 8vo.); the Case of Authors by Profession (8vo.); and a number of political pamphlets.

RAM; Battering. See *Battering Ram.*

RAMBERG, John Henry, distinguished for his paintings and etchings, was born in 1767, in Hanover. He first showed his talent by drawings of scenes in the Hartz mountains. These drawings became known to the king of England, his sovereign, as elector of Hanover, who induced him to come to London, where he provided for him. He remained there nine years, and perfected himself under Reynolds. Murphy, Bartolozzi, and other engravers of the first rank in England, engraved drawings of his. In 1788, the king sent him to Italy, whence he returned to Hanover, where he was appointed painter to the court. Few painters and designers have produced so many works as he has; but this rapidity prevented the full development of his talent. Ramberg distinguished himself particularly in the humorous caricature. The drawings to the magnificent edition of Wieland's works are all by him: some he etched himself.

RAMBOUILLET, a village of France, thirty miles south-west of Paris, and near the extensive forest of the same name. Here is situated a royal castle, with extensive grounds, and several large buildings connected with it. The castle has a fine library, and there is a celebrated breed of merino sheep here, introduced by Louis XVI. in 1786. Rambouillet was bought by that prince in 1778, and was one of his favourite residences. It was also the favourite resort of Charles X. for hunting, and here he retired when obliged to abandon St. Cloud, after the revolution of 1830. He was, however, forced to quit Rambouillet for Cherbourg, by the approach of a Parisian force on the night of August 3d.

RAMEAU, Jean Phillippe, an able French theorist in the science of music, was a native of Dijon, and born in 1683. Having, at an early age, acquired some skill in music, he joined a strolling company of performers, by whose assistance a musical entertainment of his composition was represented at Avignon, in the eighteenth year of his age. He was afterwards appointed organist in Clermont cathedral, applied himself to the study of the principles of his profession, and, in 1722, printed the first fruits of his investigation in a treatise, entitled *Traité de l' Harmonie.* Four years after appeared his *Nouveau Système de Musique Théorique,* which was followed by his *Génération Harmonique.* In 1750, he published his celebrated *Dissertation sur le Principe de l'Harmonie,* in which he reduces harmony to one single principle—the fundamental bass, on which he proves all the rest to depend. This work procured him an invitation from the court to superintend the opera at Paris. He possessed a great facility in adapting words to music, and piqued himself so much upon this talent, that he is said to have declared he would set a Dutch gazette, if it was required of him. His remaining theoretical works are, Remarks on the Demonstration of the Principles of Harmony; Reply to a Letter of M. Euler (both printed in 1752); On the Instinctive Love of Music in Man (1754); On the Mistakes of the Encyclopædia with Respect to Music (1755); and a Practical Code of Music (1760). He was also the author of six operas, *Hippolyte et Arici, Castor et Pollux, Dardanus, Samson, Pygmalion,* and *Zoroaster,* besides a great variety of ballets and other minor pieces. Louis XV. acknowledged his merits by the grant of a patent of nobility, and the order of St Michael. Rameau's theory is formed on the base of M. D'Alembert's celebrated treatise on music in which all the laws of harmony are derived from the relations of the three subordinate tones heard along with any musical tone, i. e. the octave, twelfth, and seventeenth major. Rameau died at Paris, in 1764.

RAMILLIES; a village of Belgium, in South Brabant, thirteen miles north of Namur, and twenty-six south-east of Brussels. May 23, 1706, the duke of Marlborough (see *Churchill*) gained here a signal victory over the French under marshal Villeroy and the duke of Bavaria. The numbers were about 60,000 on each side: the loss of the allies was [illegible] men, that of the French 15,000. The consequence of the battle was the immediate evacuation of Flanders by the French.

RAMLER, Charles William, a German lyric poet, translator, and critic, was born at Colberg, in 1725, studied at Halle, and was appointed a professor in the royal military school for young noblemen in Berlin, in 1748. In 1790, he became co-director of the theatre of Berlin. He died in 1798. Ramler appeared at a period poor in poets, and attached his fame to that of Frederic the Great, whom he celebrated as Horace did Augustus. From this circumstance, and from his occasional imitations of Horace, he has been called the German Horace, but is greatly below his model. Ramler had little poetical genius, but he did much to polish German versification. His ideas respecting German prosody were, however, very deficient. He translated many of the classics. His poetical works appeared in two volumes (Berlin, 1800, 4to and 8vo.); a pocket edition, in the same place (1825, 2 vols., 12mo.) Ramler wrote also in prose. The words to Graun's celebrated oratorio (the Death of Jesus) are by him.

RAMMELSBERG. See *Hartz.*

RAMMER is a cylindrical block of wood nearly fitting the bore of a cannon, and fastened on a wooden staff, or on a stiff rope well served with spun yarn. It is used to drive the charge of a cannon home, or to the innermost part of it. The rope-rammers are most general in ships of war.

RAMMOHUN ROY, an Indian rajah, who ditinguished himself by his literary attainments and his conversion from the ancient Hindoo faith to a belief in Unitarian Christianity, was born about the year 1780, at Bourduan, in the province of Bengal. The first elements of his education he received under the paternal roof, where he also acquired a knowledge of the Persian language. He was afterwards sent to Patna to learn Arabic; and here, through the medium of translations of Aristotle and Euclid, he studied logic and mathematics. When he had completed these studies, he went to Calcutta to learn Sanscrit, the sacred language of the Hindoo scriptures, the knowledge of which was indispensable to his caste and profession as a Bramin. (See *Caste*, and *Bramin*.) About the year 1804 or 1805, he became possessed, by the death of his father and of an elder and younger brother, of the whole family property, which is said to have been very considerable. He now quitted Bourduan, and fixed his residence at Mourshedabad, where his ancestors had chiefly lived. Shortly after his settlement at this place, he commenced his literary career by the publication of a work in the Persian language, with a preface in Arabic, which he entitled, Against the Idolatry of all Nations. The freedom with which he animadverted on their respective systems gave great umbrage, both to the Mahommedans and the Hindoos, and created him so many enemies that he found it necessary to remove to Calcutta, where he again took up his residence in the year 1814. Two years previously to this period, he had begun to study the English language; but he did not then apply to it with much ardour or success. Being some years after appointed dewan, or chief native officer in the collection of the revenues, and the duties of his office affording him frequent opportunity of mixing with English society, and of reading English documents, he applied to it with increased attention, and very soon qualified himself to speak and write it with considerable facility, correctness and elegance. He afterwards studied the Latin, Greek and Hebrew languages. A careful study of the sacred writings of the Hindoos had convinced him that the prevailing notions respecting the multiplicity of deities, and the superstitious devotion to the licentious and inhuman customs connected with them, were grounded upon a gross perversion of their religion. These original records appeared to him to inculcate a system of pure Theism, which maintained the existence of one God, infinite in his perfections and eternal in his duration; and that it required from its professors a mental rather than a corporeal worship, accompanied by strict and exemplary virtue. Having embraced these views of the Hindoo theology and morals, he became anxious to reform the creed and practice of his countrymen, and determined to devote his talents and his fortune to this important and honourable undertaking. The sacred books or Vedas (see *Indian languages* and *literature*) contain the religious documents of the Hindoos. This work Rammohun Roy translated from the Sanscrit into the Bengalee and Hindoo languages, and distributed the translation gratuitously. This he afterwards published in English, for the purpose of proving to his European friends, "that the superstitious practices which deform the Hindoo religion, have nothing to do with the pure spirit of its dictates." But, as might be expected, his benevolent conduct, and zeal for the good of his fellow men, exposed him to many personal inconveniences. He had, nevertheless, the gratification of witnessing the beneficial effects of his labours. From the perusal of the New Testament, in his "long and uninterrupted researches into religious truth, he found (he says) the doctrines of Christ more conductive to moral principles, and better adapted for the use of rational beings, than any other which had come to his knowledge." As the most likely method of acquiring a correct knowledge of his doctrines, he determined upon a careful perusal of the Jewish and Christian scriptures in their original languages. From this undertaking he rose with a full conviction that the Christian religion is true and divine. In 1820, he accordingly published a work, entitled the Precepts of Jesus the Guide to Peace and Happiness, consisting chiefly of a selection of moral precepts from the Evangelists. In this undertaking he was governed by the consideration, that historical and some other passages are liable to the doubts and disputes of free-thinkers and anti-Christians, especially miraculous relations, which are much less wonderful than the fabricated tales handed down to the natives of Asia, and would consequently be apt at best to carry little weight with them. Rammohun Roy, in his doctrinal views, was a Unitarian, holding, however, the pre-existence and superangelic dignity of Christ, and considering the doctrine of the Trinity as a species of polytheism, objectionable in itself, and calculated to prevent the adoption of what he considered the Christian faith by the natives of Hindoostan.—See *Correspondence relative to the Prospect of the Reception of Christianity in India*. This work was followed by the First, Second, and Final Appeal to Christians, in reply to the animadversions of Dr Marshman, Baptist missionary at Serampore, who defended the Trinitarian views of the deity of Christ, and the atonement. In 1833, Rammohun Roy visited England, where he was seized with a fever, which proved fatal. He died at Stapleton Grove, the residence of Dr Lant Carpenter, near Bristol, on the 27th September of that year. When in the extremities of death, he went through the rites of the Braminical religion, in order that his children might not lose their property and caste. For the same reason, he was privately interred at Stapleton Grove, instead of a christian cemetery.

RAMPANT, in heraldy; a term applied to a lion, leopard, or other beast, that stands on his hind legs, and rears up his fore feet in the posture of climbing, showing only one half his face, as one eye, &c. It is different from *salient*, in which the beast seems springing forward.

RAMSAY, Allan, next to Burns, the most distinguished among the modern Scottish poets, was born on the 15th of October, 1686, at Leadhills, in Lanarkshire. His father was superintendent of lord Hopetoun's mines there, and his mother, Alice Bower, was the daughter of a gentleman in Derbyshire. All the education which Allan ever received was at his native parish school in Crawfordmuir, where it is probable he merely went through the common routine of instruction to be had at such seminaries. The death of his father in early life prevented him, it is to be supposed, from receiving any thing like a liberal education, and forced him to seek, while yet a youth, a means of livelihood in the Scottish capital. There he became bound as an apprentice to a *wig-maker*—an occupation which the greater part of his biographers are very anxious to distinguish from a *barber*, but with what degree of justice we know not. Allan himself, it would seem, was not ashamed of his trade, but continued in it long after his apprenticeship had ceased; nor did he abandon it for the more congenial pursuit of bookselling, until he had held for some time a name in the poetical world. The exact period when he commenced bookseller we cannot ascertain; but he is said to have been the first who established a circulating library in Scotland. The library still exists; and is now perhaps the most extensive of the kind in Britain. His first shop, as we learn from the imprint of some of his books, was, "at the sign of the Mercury, opposite to Niddry's Wynd;" but in 1726, he removed to a house at the east end of the Luckenbooths, and, instead of Mercury, adopted for his sign the heads of Ben Johnson and Drummond of Hawthornden. In 1720, he published a collection of his poems, in one vol. quarto, which was so liberally subscribed for, that he is said to have cleared by it 400 guineas. The greater part of the pieces in this collection had previously appeared, at different periods, in the form of sheets or half-sheets; and so popular had their author become, that it was quite customary for the good people of Edinburgh to send their children with coppers for "Allan Ramsay's last piece." In 1724, the first volume of "The Tea-Table Miscellany, a Collection of Songs," appeared, which was soon followed by a second and third volume. The rapid sale of this compilation induced Ramsay to publish another, entitled, "The Evergreen, being a Collection of Scots poems wrote by the Ingenious before 1600," which was equally successful. His next publication, established his fame upon a sure and lasting basis. In 1725, appeared "The Gentle Shepherd"—the best pastoral perhaps in any language. Its success was instantaneous and unprecedented; edition followed edition with great rapidity; and it was not long till it was known by every lover of poetry, and —what bespeaks a higher popularity—till it had taken a place on the shelf of almost every cottage in Scotland. In 1728, a second quarto volume of his poems appeared; and in 1730, his "Thirty Fables," which concluded his public poetical labours. The "Fables" are undoubtedly the best of Ramsay's lesser productions. Among them stands "*The Monk and the Miller's Wife*;" a story which, although previously told by Dunbar, "would of itself," as a competent judge has remarked, "be Ramsay's passport to immortality as a comic poet." He was now at the height of his celebrity: his acquaintance was courted by many distinguished individuals, and his shop was the common resort of the literary characters and wits of Edinburgh. An extract from a letter to a friend, which he wrote about this period, gives us a very enviable view of his later years:—"Half a century of years have now rowed o'er my pow, that begins now to be lyart; yet, thanks to my author! I eat, drink, and sleep, as sound as I did twenty years syne. Yes, I laugh heartily too, and find as many subjects to employ that faculty upon as ever. Fools, fops, and knaves, grow as rank as formerly; yet here and there are to be found good and worthy men, who are an honour to human life.......My gude auld wife is still my bed-fellow. My son, Allan,* has been pursuing your science [painting] since he was a dozen years auld," &c......."I have three daughters, one of seventeen, one of sixteen, and one of twelve years old; and no waly-draggle among them —all fine girls. These six or seven years past I have not written a line of poetry. I e'en gave over in good time, before the coolness of fancy, that attends advanced years, should make me risk the reputation I had acquired." In 1736, he took a principal part in the erection of a theatre in Carrubber's Close, by which he came to considerable pecuniary loss; and it is remarked by his biographers, that this was perhaps the only unfortunate project in which he ever was engaged. In 1743, his wife died, to whom he had been married above thirty years; and soon after this, with the idea of relinquishing his shop, he built a house on the north side of Castle-hill, in rather a whimsical style of architecture. Here he spent the last twelve years of his life in a calm and pleasant manner; although he did not give up his shop until within three years of his decease. He died on the 7th January, 1758, aged seventy-two; and was buried in Greyfriars' Churchyard, where a monument to his memory is erected.

RAMSAY, Andrew Michael, better known by the name of the Chevalier de Ramsay, was born at Ayr, in 1686. He was the son of a baker in opulent circumstances, who was able to give him a good education. After spending some time at the universities of Edinburgh and St Andrews, he went to Leyden, the university of which was at that time the common resort of the literary youth of Scotland. In 1710, he repaired to Cambray, on a visit to the celebrated Fenelon, who received him into his house as an inmate of the family, and by whom he was persuaded to embrace the Catholic faith. Fenelon's influence procured him the preceptorship to the duke de Chateau-Thiery and the prince de Turenne. He was afterwards engaged to superintend the education of Prince Charles Edward Stuart and his brother Henry, afterwards Cardinal de York, and for this purpose he removed from Paris to Rome in 1724. Later in life, he visited his native country, and offered to settle a handsome annuity on his relations, which they refused to accept, on the ground of his having renounced the Protestant faith. He died, while residing with the family of Marshal Turenne, at St Germain en Laye, on the 6th May, 1743. The Chevalier de Ramsay, during his life, published several works, which give him a respectable place both in French and English literature. The chief of these are, a Life of Viscount Turenne, a Life of Fenelon, the Travels of Cyrus, and a large work on the principles of Natural and Revealed Religion.

RAMSAY, David, M. D., an eminent American physician and popular historian, was born April 2, 1749, in Lancaster county, Pennsylvania. His father was an Irish emigrant, and a respectable farmer. He studied medicine in Philadelphia, till the year 1772, when he commenced the practice of his profession in Maryland, and, after a year, removed to Charleston, South Carolina, where he soon acquired celebrity. He laboured zealously with his pen to promote the independence of his country. For some time he attended the army in the capacity of a surgeon, and was at the siege of Savannah. He was a leading member of the legislature of South Carolina, from 1776 to the conclusion of the war. In 1782, he was elected a member of the continental congress, and continued in that body till the close of the war. In 1785, he was elected to represent the Charleston district in congress, and was chosen its president, *pro tempore*. In the following year, he again returned to his profession and his literary pursuits. In 1785, he published a history of the revolution in South Carolina, which was translated and published in France. In 1790, he published the History of the American Revolution, which passed through two large editions; in 1801, the Life of Washington; in 1808, the History of South Carolina. He also left, among his manuscripts, a History of the United States, from their first settlement as English colonies to the end of the year 1808; and a series of historical volumes, entitled Universal History Americanized, or an Historical View of the World, from the earliest Records to the Nineteenth Century, with a particular Reference to the State of Society, Literature, Religion, and Form of Government of the United States of America. The first was published early in 1817, with a continuation to the treaty of Ghent, by the reverend Samuel Stanhope Smith, and other literary gentlemen (in 3 vols., 8vo.) The latter, which had occupied doctor Ramsay's leisure during more than forty years, was published in 1819 (12 vols., 8vo.) He died May 8, 1815, in consequence of wounds received two days previous from the pistol of a maniac, in open day, within a few paces of his dwelling.

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* Who afterwards became a distinguished portrait painter, as well as intelligent political writer. He was born in 1709, and died in 1784.

RAMSDEN, Jesse, an eminent mechanist and optician, was born at Halifax, in Yorkshire, in 1738. He applied himself to engraving, and, in the course of his employment, having to engrave several mathematical instruments, finally constructed them himself. He married a daughter of Mr Dolland, the celebrated optician, and opened a shop in the Haymarket, whence he removed to Piccadilly, where he remained until his death, in 1800. Ramsden obtained a premium from the board of longitude, for the invention of a machine for the division of mathematical instruments; he also improved the construction of the theodolite, the pyrometer for measuring the dilatation of bodies by heat, the barometer for measuring the height of mountains, &c.; also the refracting micrometer, and transit instrument and quadrant. He made great improvements in Hadley's quadrant and sextant, and procured a patent for an amended equatorial. Mr Ramsden, who was chosen a fellow of the royal society in 1786, was distinguished during the whole of his life by an enthusiastic attention to his own profession, which formed his amusement as well as his occupation; and such was his reputation, that his instruments were bespoken from every part of Europe; and ultimately to obtain the fulfilment of an order, was deemed a high favour.

RAMSGATE; a fashionable bathing place in the isle of Thanet, five miles from Margate, and seventy-two east of London. It has an excellent artificial harbour, formed by immense piers, extending 800 feet into the sea; more than 300 sail have been sheltered in it at once. Ramsgate derives its principal importance from the great resort of persons hither for sea-bathing, for which purpose the beach is particularly suited, in consequence of the smoothness of the sands, the limpid clearness of the water, and the salubrity of the air, and beauty of the prospects. Here are bathing-houses, conveniently and handsomely fitted up, where cold, warm, shower, and vapour-baths are provided, together with other accommodations for visitors. On the west cliff are the Isabella warm sea-water baths, the water for the use of which is raised 110 feet through an aperture in the rock, by means of machinery. Here are assembly-rooms, public libraries, and reading-rooms; and the inns, taverns, lodging and boarding-houses in general, afford good accommodations. The erection of the harbour tended greatly to the improvement of the commerce of this port, but the trade in timber from the Baltic, formerly carried on here, has been discontinued. The coasting-trade is considerable, much coal being imported; and off the coast the fishery is extensively prosecuted by large vessels from the western ports, and by some small-craft belonging to Ramsgate. In 1829, there were seventy ships belonging to this port, the burden of which altogether amounted to 4397 tons. Steam packets pass hence to London every day during the season. Here are two large yards for ship-building, rope-walks, and naval store-houses. The markets are often visited by persons bringing for sale, from France, fruit, eggs, and other articles. Population of the town and parish in 1831, 7,985.

RAMUS, Peter, a philosopher of the sixteenth century, was a native of France. He went to Paris about 1523, when he was but eight years old, and became a lackey in the college of Navarre. Such was his strong inclination for learning, that he not only devoted to study all the time he could spare in the day, but also a part of the night. After attending a course of philosophy, he was admitted to the degree of M. A., on which occasion he contested the infallibility of Aristotle. His opinions excited violent opposition, and the partisans of the Aristotelian philosophy had recourse to the civil power, in order to silence their adversary. His publications were prohibited, and ordered to be burnt before the royal college of Cambray, and he was commanded to abstain from teaching his doctrines, in 1543. Having obtained the patronage of the cardinal De Lorraine, the prohibition of lecturing was withdrawn in 1547; and, in 1551, he was appointed royal professor of rhetoric and philosophy at Paris. His spirit of free inquiry ultimately led him to become a Protestant. This change obliged him to flee from Paris; but, in 1563, he was restored to his chair. In the massacre of St Bartholomew's, 1571, Ramus was one of the victims. His works, relating to grammar, logic, mathematics, &c., are numerous.

RANA. Under this head we shall not go into a description of this genus of reptiles, but shall confine ourselves to an account of the frogs which make so important a part of it. Toads the reader will find described in a separate article. The muzzle of frogs terminates more in a point than that of toads. The nostrils are visible at its summit. The teeth are very small; the eyes large and brilliant, and surrounded with a yellow circle; the ears are placed behind them, and covered by a membrane. The muscles of frogs are considerable in relation to their bulk, and peculiarly elastic, strong, irritable, and sensible to the action of galvanism. Their general sensibility does not appear to be great; they are killed with difficulty; the heart contracts and dilates a long time after the death of the animal, and even when it has been extracted from the body. The ordinary mode of progression is by leaps. Frogs feed on the larvæ of aquatic insects, on worms, small mollusca, flies, &c., and always choose a prey which is living and in motion. They are useful in gardens by destroying great quantities of small slugs. These reptiles are usually found during the summer on the ground in humid places, in the grass of meadows, and on the banks of streamlets, into which they continually leap and dive. They swim well and without difficulty by means of their hinder feet, the toes being united by a membrane. At the close of warm rains in the fine season, they frequently spread themselves through the country. To this is owing the popular belief in the rains of frogs—a very ancient prejudice. Frogs are distinguished by a peculiar cry, termed *croaking*, particularly during rain and hot weather, in the morning and evening. During the feudal *régime* in France, when the castles were surrounded with water, it was the occupation of the slaves or villains to strike the water of the dikes morning and evening to prevent the frogs from disturbing the repose of their masters. Even up to the period of the revolution, this custom existed in many places. As soon as the summer is over, and the weather begins to be a little cold, the frogs lose their natural voracity, and cease eating. As the cold increases, they sink into the mud of deep waters, the holes of fountains, and sometimes even into ground not covered by water, and pass the winter in profound lethargy. The female lays annually from six to twelve hundred eggs; and frogs can live a great number of years if they escape their enemies,—serpents, pikes, vultures, storks, &c.,—which destroy immense quantities of them. In France they are much used for food, and in Germany also. The continental physicians employ their flesh, variously prepared, in the treatment of a number of diseases. There are numerous species of this animal. The *green frog* (*rana esculenta*) is about two or three inches long, without reckoning the hinder feet. It abounds in stagnant waters on the continent of Europe and in Asia, but is less common in England than the *rana temporaria*. It seldom comes to land, and never removes from the banks of streams, ponds, or lakes. The *rana temporaria*, or common frog of England, is tolerably abundant throughout Europe, prefers wooded and mountainous situations, and frequents meadows and gardens during fine weather. It is generally found on land in summer. At the approach of winter, it retires into fountains and ponds of pure water, but does not bury itself in the mud at the bottom. The *rana clamitans*, found in Carolina, of an obscure colour, is the liveliest of all known frogs. It croaks continually, and never removes far from the shore. The *rana pipiens*, or *bull frog*, is the largest species of this genus, being three or four inches broad, and six or eight in length, without including the feet; with the limbs extended, it measures about eighteen inches. It inhabits North America, particularly the southern part of the United States. Its cry is very deep and hoarse. It is very fond of young ducks and goslings, which it swallows whole. On level ground, it makes leaps of from six to eight feet. The *rana gruniens*, if distinct from the preceding species, is fully as large. It is found in the West Indies, and is said to be able to clear, with a leap, a wall five feet high. The *rana paradoxa* is found at Surinam, and in other countries of South America. As the adult animal is less than the tadpole, in consequence of the loss of an enormous tail, and of some envelopments of the body, some observers formerly supposed that the animal passed from the frog to the tadpole state, and was subsequently transformed into a fish; this error, however, is completely refuted.

RANCE. See *Trappe, La.*

RANELAGH ROTUNDA and GARDENS; near Chelsea, built and opened for musical performances, in 1742. Degenerating into a scene of licentiousness, it was shut up in 1803, since which the buildings have been wholly demolished.

RANGE, in gunnery; the path of a bullet, or the line it describes from the mouth of the piece to the point where it lodges. *Range* is also the distance to which a bomb or cannon ball is thrown from a piece of artillery by the explosion of gunpowder. The flight of a shot is distinguished by artillery men into two different ranges, of which the first is called the *point-blank*, and the second the *random shot*. To these also may be added the *ricochet*, or *rolling* and *bounding shot*. The point-blank range is the extent of the apparent right line described by a ball discharged from a cannon. The random shot is when, by letting the breech down upon the bed of the carriage, the ball is carried to its greatest possible distance, and describes a curve in its flight. The ricochet is fired by elevating the piece from three to six degrees, and only charging it with a quantity of powder sufficient to carry the shot along the face of the works attacked. The shot thus discharged, so as to go just over the parapet, rolls and bounds about, killing, maiming, or destroying all it meets in its course, creating much more disorder, by going thus slowly, than if thrown from the piece with greater violence. As one of the effects of the bomb results from its weight, the range of mortars is extremely different from that of cannon, because the former is not pointed at a certain object, like the latter, but inclined to the horizon at a certain angle, so that the bomb, being thrown up obliquely, may fall upon the place intended: hence it appears that the mortar has no point-blank range, or, at least, that no use is made of it. *Ricochet* signifies *duck and drake*—a name given to the bounding of a flat stone thrown almost horizontally into the water. It was the opinion of engineers formerly, that, by charging the pieces high, the ball was thrown to a greater distance: hence the pieces were charged with two thirds, or even the whole weight of the shot, in order to impel it with greater velocity; but it has been discovered since, that the half or one third of the weight of the ball is the fittest charge for the piece. It may not be amiss to observe here, that the range of cannon is greater in the morning and at night than at noon, and in cold than in hot weather. The reason is, that, at these times, the air being less heated, gives less way to the dilatation of the powder, which being, by these means, confined, as it were, to a smaller sphere of action, must have a stronger effect in proportion. When the lengths of cannon are proportionable to the height of the charge, the shot will be discharged with the same velocity, whatever the calibre may be. The greatest distance to which a shell can be thrown, with the strongest charge, is little more than about 1800 or 2000 fathoms.

RANGER; an officer of a forest, appointed to drive the deer back from the purlieus, to prevent trespasses, &c.

RANGOON (formerly *Dagoon*); a city of Birmah, in Pegu; 600 miles south-east of Calcutta; lon. 96° 9' E.; lat. 16° 47' N. It is the principal port of the Birman empire, situated on a branch of the Irrawaddy, or Ava, called the *Rangoon river*, thirty miles from the sea, and was founded in the year 1755, by Alompra, king of Birmah, who had taken the country from the king of Pegu. The river is commodious for building ships, and the forests of Birmah and Pegu yield teak wood. The population has been estimated at 30,000, but is not more than 12,000. It was taken by the English in 1824, but restored. The American Baptist missionary society has a mission here.

RANK. In the article *Ceremonial of European Powers*, we have spoken of the former and present arrangement of rank among them. As to the distinctions of rank among individuals, these will always be more marked in proportion as the government of a country is arbitrary, and the civic spirit dead. The Roman and Byzantine imperial courts exhibit a striking instance of the importance attached to these distinctions, when compared with the vigorous period of republican Rome. In Russia, the most absolute government in Europe, the people are divided into fourteen classes; and whoever becomes a member of one of the eight highest, receives nobility for himself and family. The rank of all these classes is estimated with reference to military degrees; thus a doctor of medicine, if we are rightly informed, is equal in rank to a captain of infantry. In a country where the mania for titles is carried to such excess as in Germany (see *Counsellor*, *Ceremonial*, and the note to article *Majesty*), it may easily be imagined that there must have been an abundance of contested questions respecting rank.

In the seventeenth and eighteenth centuries, these prevailed there, and in other countries of the European continent, to a ridiculous extent. There are, in England, above sixty degrees of precedency; but these are intended principally to designate the order to be observed in processions, and on other occasions of ceremony, and have little to do with determining the respect which is paid to men in society.

RANK, in war, is a row of soldiers placed side by side; while FILE is a number drawn up in a direct line behind each other.

RANUNCULUS; a genus of plants containing about 150 species, almost exclusively inhabiting the northern hemisphere. The species of *ranunculus* are herbaceous plants, with entire lobed or dissected leaves, and usually terminal flowers, of a yellow colour, but, in a few species, white. The calyx consists of five caducous leaves. There are five petals, and numerous stamens, surrounding a cluster of one-seeded capsules. Almost all are acrid and caustic, poisonous if taken internally, and, when externally applied, will raise blisters, which are followed by deep ulcerations, if left on too long. Beggars sometimes avail themselves of this property to produce ulcers, in order to excite pity. This acrid principle is destroyed by desiccation or immersion in hot water.—The *R. Asiaticus* is a native of the Levant and North Africa, and was first brought to Europe by the crusaders. It is now a favourite ornamental plant, which has produced innumerable varieties, of every shade and combination of colours excepting blue. The flowers are double and semi-double, and often two inches or more in diameter.

RANZ DES VACHES (in German, *Kuhreihein*) is the name of the celebrated national air, which the herdsmen of the Alps in Switzerland sing or play when they drive out the herds. It consists of a few simple intervals, is entirely adapted to the simple life of these people and their instrument (the *Alpenhorn*, horn of the Alps), and has an uncommon effect in the echoes of the mountains. This effect becoming intimately associated with the locality of Switzerland, explains the many anecdotes of the home-sickness caused by the sound of the *Ranz des Vaches*, when heard by Swiss in foreign countries. There are, however, variations in the melody, and we find, even in Rousseau's *Dictionnaire de Musique*, several *Ranz des Vaches*. In 1815, appeared at Berne, the second edition of a complete collection of these airs. Appenzell is said to have the most genuine and original *Ranz des Vaches*.

RAPE (*brassica napus*); a cruciferous plant, with small yellow flowers, belonging to the same genus with the cabbage and turnip, and cultivated, to a considerable extent, in many parts of Europe. There are two varieties, the rape and cole, the latter distinguishable by its greater height, fewer branches, and its being more soft and tender. Both are frequently sown intermixed. When sown separately, the cole is usually used as fodder for sheep, and the rape allowed to remain for the seed. The harvest commences in the month of August, when the pods are yellow, but before perfect maturity; and, as the seed is easily shed, it is customary in some places to thresh the plants in the field, upon a large cloth. Oil is obtained from the seeds by pressure, and is used in large quantities for various economical purposes, for making the soap called *green soap*, for burning in lamps, by clothiers and others; also in medicine, &c., &c. It is apt to become rancid, though there are means of purifying it. The oil-cake is sometimes employed for fattening oxen, or as a manure. The roots may be eaten as a substitute for turnips, but they have a stronger taste. The stalks are generally burnt, and the ashes, which are very rich in alkaline matter, are collected and sold. A mixture of rape and millet seed is frequently employed as food for cage birds. This plant grows wild in many parts of Europe. The radical leaves are lyrate, and the superior ones very smooth, and embracing the stem.

RAPE CAKE. See *Rape* and *Manure*.

RAPHAEL, or RAFFAELLO SANZIO or DE' SANTI, the greatest painter of the modern, or, as he is considered by many, the last of the ancient school of art, was born at Urbino, on Good Friday, March 8, 1483, and died at Rome, on Good Friday April 7, 1520. A Madonna and Child, painted by him on the wall of the yard of his father's house, without his having received any instruction (which painting was subsequently transferred, together with the portion of wall on which it was painted, to a room in the house, where it may still be seen), convinced his father, Giovanni Sanzio, an indifferent painter, of his own incompetency to do justice to the talents of his son, and induced him to place him in the school of an abler master. At his request, Perugino received the young painter into the number of his pupils. Raphael soon surpassed his numerous compeers, and in a short time, so completely acquired his teacher's manner, that it is difficult to distinguish the works of the two belonging to this period. This is shown by Raphael's first works,—the Coronation of the Duke Niccolo da Tolentino, a Crucified Saviour, between two Angels, a Holy Family, a Betrothal of Mary, and, particularly, the Crowning of Mary, for the Franciscan convent in Perugia,—all executed by him between his fifteenth and eighteenth years. During this time, the painting of the library of the cathedral at Sienna was intrusted to Pinturicchio, who had been a fellow pupil of Raphael, and now invited him to assist in this labour. Raphael had already completed a great part of the cartoons for this purpose, when he learned that the cartoons of Michael Angelo and Leonardo da Vinci, which had been prepared by these two great artists in consequence of the prize offered by the city of Florence, were publicly exhibited in that city. Burning with desire to behold them, he hastened to Florence. These cartoons, and Florence itself, then the seat of all that was beautiful, made a deep impression on his youthful sensibilities; and he derived great advantage from the acquaintance of many young artists of distinction, Ghirlandaio, San Gallo, &c. Although Raphael's biographers do not expressly say that he studied assiduously in Florence, the works of the earlier masters, Cimabue, Masaccio, Giotto, Verochio, Ghiberti, as Michael Angelo and Leonardo da Vinci had done, the fact is evident from the pictures executed by him while there, among which a Madonna and Child (now in the Tribuna at Florence) is highly commended by Vasari. The death of his parents obliged Raphael to hurry home; and while he was arranging his father's affairs in Urbino, he completed, in his hours of leisure, several paintings, e. g., two Madonnas, a St George, and probably its pendant, the St Michael (now in Paris), Christ praying in the Garden (in Paris), and, in 1504, the Marriage of Mary (*Lo Sposalizio*, now in Milan). His love for Perugia soon induced him to return thither. He there sustained his reputation by several paintings—a Madonna for the church of the Frati de' Servi, a Mater dolorosa, over which he delineated, in a second picture, God the Father (now in the Palace Colonna, at Rome) with some other easel-pieces, and a Christ, with God the Father, surrounded by several Saints, for the small Camaldulian convent, which was his first painting in fresco. All these works partake somewhat of the style of his master, and do not exhibit the grandeur, dignity, and power of his later performances, but are distinguished for the sensibility and feeling belonging to the earlier school. His desire for further improvement drew him a second time to Florence, where he zealously pursued his study of the old masters above mentioned, and where his acquaintance with Fra Bartolomeo gave him a more correct knowledge of colouring. He seems to have spent the whole time of his residence in that city in his studies; at least it is known that he executed there nothing but a few portraits and the cartoon for his Entombing of Christ. This picture itself he painted in Perugia, whence it was afterwards transferred to the Borghese palace at Rome. It is a miracle of composition, design and expression, and was surpassed, in these respects, by few of his subsequent performances. After finishing it, Raphael returned, for the third time, to Florence, where his studies became again his chief employment; at least we are able to point out, with certainty, as having been executed at this time, only the excellent Madonna, called *La Bella Giardiniera* (now in Paris), and another Madonna, with the Fathers of the Church (now in Brussels), neither of which was entirely finished by Raphael. His repeated residence in Florence had the greatest influence, not only on himself, but on the whole of the modern school of art. He found that Cimabue, Giotto, Fiesole, and the Florentine artists of the time, could not only compete with his teacher, Perugino, in all the departments of art, but that some of them—Masaccio, Fra Filippo Lippi, Mariotto Albertinelli, Ghirlandaio and Fra Bartolomeo—surpassed him in excellence of composition, correctness of design, and liveliness of colouring. In the works of Ghirlandaio, and above all of Masaccio, he found, what he most desired, a grander style in forms, drapery, and outline. As Raphael had already acquired the excellences of the greatest masters of his time in Romagna, he now possessed himself of those of the Florentine school, for which he ever entertained a great esteem. A striking proof of this was his copying, in his *loggie*, without the least alteration, two figures by Masaccio, which may still be seen in the Carmelite monastery at Florence, namely, Adam and Eve driven from Paradise by the Angel. Pope Julius II. had employed Bramante in rebuilding St Peter's, and in the embellishment of the Vatican. At Bramante's suggestion, Raphael was, in 1508, invited to Rome. The pope received him with distinguished favour, and the artists of Rome with the greatest respect. Here he executed the *Disputa*, or Dispute of the Fathers of the Church, on the wall of the second chamber, called the *stanza della Segnatura*, next to the great hall of Constantine. Between this painting and his Entombing of Christ there is a similarity, which is not the case with his later performances. In the grouping, also, he has adhered to the style of his earlier predecessors; but the *Disputa* is by far the more perfect of the two. All is life, motion, action: the variety of the characters is admirable; every stroke is full of meaning. If we divide Raphael's works into several periods, the first comprising his earlier performances, executed in the manner of Perugino, the second comprising those which he executed in Urbino, Florence, &c., we recognise in the *Disputa* the transition to the third manner, which is still more clearly manifested in the School of Athens, the second grand painting in this chamber. This painting (which was probably preceded by the Parnassus, the third great painting of the room) displays far more freedom of handling, and more manliness and energy. By it Raphael gained so completely the favour of the pope, that he caused almost all the frescoes of other artists in the Vatican to be effaced, that the rooms might be adorned by him. Raphael painted in their stead, in the above-mentioned *stanza*, the allegorical figures of Theology, Philosophy, Justice, and Poetry, in the corners of the ceiling; the Fall of Adam, Astronomy, Apollo and Marsyas, and Solomon's Judgment, all having reference to the four principal figures of the apartment; and, lastly, on the fourth wall, over the windows, Prudence, Temperance, and Fortitude; below them, the emperor Justinian, delivering the Roman law to Tribonian, and Gregory X. giving the Decretals to an Advocate, and, under them, Moses and an armed allegorical figure. In 1511, all the pieces of the first *stanza* or hall were finished. According to Vasari's account, he now executed several less important but excellent frescoes (Isaiah in St Augustine's, the Prophets and Sibyls in Sta-Maria della Pace, and the celebrated *Madonna di Foligno* in the Vatican). The progress which Raphael made, in his peculiar style, is shown by his next painting in the *stanza*, the Expulsion of Heliodorus from the Temple. Here the style is far more earnest, grand, bold, and energetic, the execution far more spirited and masterly. This was followed, in 1514, after the accession of the new pope, Leo X., by his Leo the Great stopping the Progress of Attila, the Deliverance of Peter from Prison, and, on the ceiling of this *stanza*, Moses viewing the burning Bush, the Building of the Ark, the Sacrifice of Isaac, and Jacob's Dream. Nearly contemporary with them are the following easel-pieces: the famous *Madonna del Pesce* (in the Escurial), which was transferred, in Paris, from wood to canvass; his equally beautiful Cecilia, which is said to have been finished by Giulio Romano; a Holy Family, called *La Perla* (in the Escurial); Ezekiel's Dream; among several Madonnas, that called *Dell' Impannato;* Christ bearing the Cross, known by the name of *Lo Spasimo di Sicilia* (now in Madrid); Christ in Glory, surrounded by saints; *I cinque Santi;* his own portrait (now in Munich); the portrait of Leo X. (now in Paris), &c. Albert Durer, induced by Raphael's reputation, is said to have made him an offer of his friendship, and to have sent him several of his own etchings, with his portrait, and to have received, in return, a number of drawings by Raphael's hand. With the Conflagration of the Borgo (*Incendio del Borgo*), extinguished by the Prayers of Leo, Raphael began the third *stanza* of the Vatican. This work is a master-piece for strength and truth of expression, beauty of forms, excellence of grouping and variety. It was followed by the Coronation of Charlemagne, Leo III.'s Vindication of Himself before Charlemagne, and the Victory of Leo IV. over the Saracens at Ostia (on which, however, Raphael's scholars were employed in working from his designs). He next completed the galleries (*loggie*) of the Vatican palace, by which the rooms communicate, and which had been left unfinished by Bramante, and furnished designs for the paintings and stucco-work with which they were to be adorned. The execution of the paintings (excepting four done by himself) Raphael intrusted to Giulio Romano and some of his other pupils, and the stucco-work to John of Udine. In this way was formed a complete series of works of art, which have exalted the palace of the Vatican into a temple of the arts. The pope, charmed with the excellence of these performances, committed to Raphael the decoration of another *stanza* of the Vatican with images of the saints and apostles, appointed him superintendent of all the embellishments of this palace, and loaded him with marks of honour. During this time, Raphael produced many other excellent pieces, prepared designs for several palaces in Rome and other cities of Italy, and finished the Madonna for the church of St Sixtus in Piacenza (now in Dresden), unquestionably one of the master-works of his pencil. The loftiness, dignity, and sublimity, combined with sweetness, grace, and beauty, which reign in this picture, render it inimitable. Other works of this period are St Michael, the portraits of Beatrice of Ferrara, of his beloved Fornarina, of Carondelet (now in England), of count Castiglione, and of the beautiful Joanna of Arragon (both in Paris). Of the last there are two excellent copies, which are often represented as the work of the artist himself, one in the possession of count Fries at Vienna, the other of Wocher at Basle. To this time, also, belong the frescoes in the Farnesina, representing the life of Psyche in twelve pictures, and Galatea, all, except the last, executed by his scholars; also the designs from the fable of Psyche, altogether different from the former, thirty-eight in number, and the Madonna della Seggiola (now in Paris). It was probably at a later period that Raphael prepared for Augustino Ghigi designs for the building and decoration of a chapel in Sta-Maria del Popolo, and for Leo X. the celebrated cartoons (see *Cartoons*) for the tapestry of one of the chambers of the Vatican. These tapestries were afterwards annually exhibited in the Vatican, on the festival of *Corpus Christi*, but have lately been dispersed. This is the more to be lamented, since they have often been preferred to the *stanze* of Raphael, in point of composition, loftiness of character, variety of expression, grouping, attitudes, &c. For painting the fourth *stanza*—the hall of Constantine, in oil—Raphael left only a few sketches, especially of the battle between Constantine and Maxentius, which were used by Giulio Romano and his other scholars, to whom the labour was eventually entrusted. The pictures, however, of Justice and Benignity, in this hall, were probably executed by his own hand. Several easel-pieces also seem to have been executed by him about this period; among others, John in the Desert (of which there exist several copies, namely, in Florence, in London, in the gallery of the king of the French, in Vienna, and in Darmstadt: the copies are so good, and so much alike, that the original cannot be distinguished, and is not known); his Madonna and Child, on whom an angel is strewing flowers, and a St Margaret. Raphael's last and unfinished painting—the Transfiguration of Christ—is in the Vatican. Although critics have objected to this painting that it contains two subjects, and consists of two pictures, every one must concede that it is the most perfect masterpiece which modern art has produced. The composition is so noble, the design so perfect, the expression so elevated and sublime, the characters so various, the colouring (as far as it proceeds from Raphael) so true and vigorous, that it surpasses all his other works in these points. The head of Christ, in which this combination is most admired, is said to have been his last labour. Attacked by a violent fever, which was increased by improper treatment, this great artist died at the age of thirty-seven years. His body was laid out in state in his study, before his Transfiguration, and consigned, with great pomp, to the church of Sta-Maria Rotonda (formerly the Pantheon), where his bones still rest, with the exception of his skull, which was afterwards placed in the academy of St Luke. His tomb is indicated by his bust, executed by Naldini, and placed there by Carlo Maratti, and by the epitaph of cardinal Bembo:—

Ille hic est Raphael, timuit quo sospite vinci
Magna rerum parens, et moriente mori.

All contemporary authors describe Raphael as kind, obliging, modest, and amiable, equally respected and beloved by high and low. The beauty of his figure, and his noble countenance, which inspired confidence, prepossessed the beholder in his favour at first sight. He died unmarried, though by no means averse to women. In accordance with his last will, his property went to his favourite scholars, Giulio Romano and Francesco Penni. When we consider the number of Raphael's paintings, however severe we may be in judging of their genuineness, it seems hardly credible that the entire compass of a human life could be sufficient for their execution. They prove the wonderful fecundity of his genius, and the facility with which he executed. It is moreover to be considered, that Raphael furnished the designs for a great number of pieces executed by his scholars; devoted much study to his most important paintings (as is shown by the numerous sketches of Madonnas, of the school of Athens, of the Dispute of the Fathers, &c.); and, in many cases, first drew all his figures naked, in order the better to adapt the drapery and its folds to their respective attitudes. And if we further reflect that the supervision of the building of St Peter's church, and the preparation of designs for the erection of other churches and palaces, with several other collateral tasks, were imposed on him, we must be struck with the highest admiration of his genius. At first, his design conformably with the taste of the times, and the instruction which he had received, was somewhat stiff and dry. After studying with assiduity nature and the antiques, he formed for himself an ideal, which, by its harmony with nature, touches the feelings, while the Greek ideal rather overpowers by its loftiness. In his manhood, his pencil acquired greater freedom, and his figures became full of life and motion. His drapery, always simple and light, in his latest pieces generally forms large masses, and is excellently arranged so as not to conceal the parts intended to be shown. In foreshortening, and in perspective, he was imperfect. In colouring, he was at first dry; till, taught by Fra Bartolomeo, he consulted nature alone. Although, in this department of the art, he never reached the excellence of Correggio or Titian, his colours always appearing too heavy and dull, yet his St John in Florence, the Fornarina, and his Transfiguration, show how far he had advanced; and only from these pictures can we form a judgment; for his other works, of the best period, were generally executed by his scholars, or, at most, retouched by him. The distribution of light and shade Raphael understood very well; but, with respect to the *chiaro-scuro*, he is by no means to be compared with the above-mentioned great colourists. On the other hand, composition and expression must almost be considered as Raphael's exclusive property; and in these respects he has never found a rival. He always selected the moment of action which expressed most clearly the dispositions of the actors. Avoiding all unnecessary exertion of strength, all excess, occupied solely with the object to be represented, he endeavoured to give to his persons just so much motion as was requisite. Thence it is that we frequently find in his works straight, simple attitudes, which are, nevertheless, so beautiful in their place, and leave so much room for the expression of feeling. Unlike other artists, he first meditated on the whole of the scene to be represented, and the general character of the expression; next proceeded to the figures, and lastly to the single parts of them. In this way, his figures possess a harmony which many other artists have aimed at in vain. The most distinguished of his scholars were Giulio Pipi Romano, Francesco Penni il Fattore, Polidoro Caldara di Caravaggio, Benvenuto Garofalo, John of Udine, Bartolomeo Ramenghi il Bagnacavallo. These, with their followers, and later imitators, constitute the Roman school, founded by Raphael, which has ever been distinguished above others for the excellences which belonged to its founder. The latest Lives of Raphael are those of Braun (Wiesbaden, 1815), of Fuseli (Zurich, 1815), and of Quatremere de Quincy (Paris, 1825). Marco Antonio (Ant. Raimondi) engraved Raphael's drawings, and Raphael himself is said to have etched the outlines of some of the plates. A *Catalogue des Estampes gravées d'après Rafael, par Tauriscus Eubœus* (count Lepell), appeared at Frankfort on the Maine, in 1819; and the *Etudes calquées et desinées d'après 5 Tableaux de Raph., accompagnées de la Gravure au Trait et de Notices hist. et crit.*, by Emer. David (Paris, 1822). These five pieces are the *Agnus Dei*, *La Perle*, *La Visitation* (since engraved by Desnoyers), *La Vierge au Poisson*, and *Lo Spasimo*, which were carried to France in 1813, were retouched there, and returned to Spain in 1815.

RAPIN DE THOYRAS, PAUL, a historian, born at Castres, in Languedoc, in 1661, studied law under his father, who was an advocate, until the revocation of the edict of Nantes drove him to Britain, and subsequently to Holland, where he entered a company of French cadets. In 1689, he followed the prince of Orange into Britain, and distinguished himself at the battle of the Boyne. In 1707, he settled at Wesel, in the duchy of Cleves, and devoted himself to the composition of his History of England. He died at Wesel in 1725. His great work, *L'Histoire d'Angleterre* (Hague, 10 vols., 4to, 1725—1726), has been twice translated into English; and Tindal continued it up to 1760. It is prolix and unanimated, but impartial, and contains much solid information.

RAPP, JOHN, count of, a French general during the revolutionary war, was born in Alsatia, in 1772. In 1788, he entered the military service. As aid of general Desaix, he accompanied him during the campaigns in Germany and Egypt. After Desaix had fallen at Marengo, Rapp became aid to Bonaparte, to whom he had carried information of Desaix's death. In 1802, he executed the commission which he had received from the first consul to exhort the Swiss to a cessation of hostilities, and to proffer the mediation of France in the conflict of parties, which had destroyed the tranquillity of the country since its occupation by the French armies. The Swiss submitted to Bonaparte's decision. In the following year, Rapp was despatched to the mouth of the Elbe to superintend the erection of works to protect the country against the landing of the British. On the breaking out of the war against Austria, in 1805, he accompanied Napoleon, and, after the battle of Austerlitz, where he threw the Russian guards into confusion by a bold attack with his cavalry, and took prince Repnin prisoner, he was made brigadier-general. In the war with Prussia and Russia, he also fought with reputation, and, in the summer of 1807, received the chief command in Dantzic, in the room of general Lefebvre. With the exception of a short interruption in 1812, when he distinguished himself in Russia, he remained seven years commander of Dantzic, which he defended after the retreat of the French army from Russia, till 1814, during a severe siege, in which he displayed great talent and brilliant courage, and not till all means of defence were exhausted, and he was compelled by famine, did he capitulate. He was taken, as a prisoner of war, to Kiew. Returning to France in 1814, he was received with distinction by the king, and, in March, 1815, was intrusted with the command of the first *corps d'armée*, destined to retard the progress of Napoleon. But when the defection of the whole army rendered all resistance impossible, Rapp also went over to Napoleon, who made him commander of the army of the Rhine, which occupied the lines on the Lauter and from Weissenberg, and extended along the Rhine as far as Huningen. After several battles with an enemy of superior force, Rapp retreated under the cannons of Strasburg. When Louis XVIII. returned a second time to Paris, Rapp retained the command of the fifth division, granted him by Napoleon, till September of the same year, when the army was disbanded. He retired to his estates, but soon returned to Paris. When the news of Napoleon's death arrived, Rapp was about the person of the king. The information moved him so strongly, that he expressed his feelings aloud:—"I am not ungrateful," he said, and immediately withdrew. The king, informed of his conduct, sent for him, and thus addressed him:—"Rapp, I know that you are greatly affected at this information: this does honour to your heart, and I only love and esteem you the more for it." Rapp died in 1821, being at the time lieutenant-general of the cavalry. After his death appeared the interesting *Mémoires du Général Rapp, écrits par Luimême* (Paris, 1823). See *Mém. des Contemporains*, 1st No.; these are genuine; a former edition was declared spurious by the widow of the general.

RAPPAHANNOCK; a river of Virginia, which rises in the Blue ridge, and runs east-south-east about 180 miles, and flows into Chesapeake bay, twenty-five miles south of the Potomac. It passes the towns of Falmouth, Fredericsburg, Port Royal and Leeds, and is navigable to Fredericsburg, 110 miles, for vessels of 130 or 140 tons.

RARITAN; a river of New Jersey, formed by two branches which unite twenty miles above New Brunswick. It becomes navigable two miles above that city, at a place called *Brunswick Landing*. It passes Amboy, and then widens into Raritan bay, which is immediately connected with the ocean.

RAS; Arabian for *head*, and prefixed to names of promontories or capes.

RASCIANS, OR RAITZEN; a Sclavonic tribe, which formerly inhabited Servia and Illyria, but at present is spread through Sclavonia, Lower Hungary, Transylvania, Moldavia, and Walachia. They profess the Greek faith, but many of them have joined the Catholic church.

RASH (*exanthéma*); an eruption of the skin. It consists of red patches on the skin, diffused irregularly over the body. Portions of the cuticle are often elevated in a rash, but the elevations are not acuminated. The eruption is usually accompanied with a general disorder of the constitution, and terminates in a few days by cuticular exfoliations.

RASPBERRY. The common cultivated raspberry (*rubus idæus*) has a woody root, from which arise several upright stems, attaining the height of three or four feet, and rough with numerous fine prickles: the inferior leaves are pinnate, composed of five oval acute toothed leaflets, green above, and whitish and downy beneath; the superior ones are ternate; the flowers are white, and rather small.

supported on slender branching peduncles, which arise from the axils of the superior leaves: they are succeeded by a well known fruit, composed of numerous rounded succulent grains, and of a delicious flavour. It grows wild in rocky places, throughout the colder parts of the northern hemisphere. Several varieties are cultivated, differing in the size and colour of the fruit, either red, flesh-coloured, or yellow. One variety bears twice a year. A light soil is best suited to the culture of the raspberry, and an eastern or western exposure, slightly shaded. It is generally propagated by suckers, which the old roots give out in profusion; and the time of planting continues from November till the middle of March. A distance of three feet in every direction should be left round the stocks, and no more suckers should be suffered to remain than are intended to bear the following year, unless young plants are wanted; and if very large fruit is the object, no suckers should be left. On the other hand, when the strongest suckers are wanted, the fruit-bearing shoots should be cut down. Raspberries have a grateful subacid taste, and, unlike most fruits, do not undergo the acetous fermentation in the stomach; their perfume is very delightful. They are much used in cookery and confectionary, as well as in desserts: with sugar they are made into jam and jelly, and also into cakes. The juice, mixed with a certain portion of sugar and brandy, constitutes the liquor called *raspberry brandy;* and it is sometimes manufactured into wine. In some parts of Europe, a white vinegar is prepared by infusion, which is converted into a sirup, by adding the requisite quantity of sugar. The genus *rubus* belongs to the natural order *rosaceæ*, comprehending the different sorts of blackberries and dewberries, as they are termed. One of them, the flowering raspberry (*R. odoratus*), is a highly ornamental shrub, distinguished by its very large bright red flowers, and is frequently cultivated in gardens, both in Europe and America.

RASTADT; a town with 4200 inhabitants, in the grand-duchy of Baden, on the river Murg, about nine miles from Carlsruhe. The beautiful castle Favourite was, until 1771, the residence of the margraves of Baden-Baden. At the congress of Rastadt, 1713, prince Eugene (for Austria) and marshal Villars (for France) began the negotiations which put an end to the Bavarian war of succession by the peace of Rastadt, March 6, 1714. The second congress at Rastadt was opened Dec. 9, 1797, for the purpose of concluding peace between France and Germany, and was dissolved by the emperor of Germany, April 7, 1799. (See *Congress*.) The French ministers, Roberjot, Bonnier, and Jean de Bry, set out to return, April 28, 1799, but, about 200 paces from the suburb, were attacked by a troop of hussars. Roberjot and Bonnier were killed, their papers taken, and their persons plundered; Jean de Bry and the secretary Rosenstiel escaped to Rastadt. The diet at Ratisbon ordered an inquiry into the affair, which it left to the emperor. This, after being prosecuted for some time with spirit, was at length dropped. It is now generally believed that though the hussars had orders to take the papers from these ministers, the killing was probably caused by their wish to plunder.

RAT. The common brown or Norway rat, now so extensively diffused, was introduced into Europe from Asia in the eighteenth century (as late as the year 1750). There are few parts of the world, now visited by navigators, where this animal has not been introduced; and the immediate consequence of its introduction has been, that all the native rats have been destroyed, or obliged to withdraw beyond the reach of this subtle and implacable enemy. Prior to the year above mentioned, this rat, now so notorious for its ravages, was almost, if not wholly, unknown in Europe. It was conveyed to Britain about the period above mentioned, in the timber-ships from Norway; and hence it has received one of its common names. The brown rat takes up its residence about wharfs, store-houses, cellars, granaries, &c., and destroys the common black rat and mouse, or entirely expels them from the vicinities it frequents. To chickens, rabbits, young pigeons, ducks, and various other domestic animals, it is equally destructive, when urged by hunger and opportunity. Eggs are also a very favourite article of food with this species, and are sought with great avidity; in fact, every thing that is edible falls a prey to their voracity, and can scarcely be secured from their persevering and audacious inroads. In the country, they take up their abodes according to convenience and the abundance of provisions, infesting especially mills, barns, and out-houses, or residing in holes along the banks of races or other water-courses. The brown rat swims with great facility, and dives with vigour, remaining under water for a considerable time, and swimming thus to some distance. When attacked, and not allowed an opportunity of escaping, he becomes a dangerous antagonist, leaping at his enemy, and inflicting severe and dangerous wounds with his teeth. The most eager cat becomes immediately intimidated in the presence of one of these rats thus penned up, and is very willing to escape the dangers of an encounter. The brown rat is amazingly prolific, and, but for its numerous enemies, and its own rapacious disposition, would become an intolerable pest. Happily for the world, in addition to man, to the weasel, cat, some species of dog, &c., rats frequently find destructive enemies in each other, both in the adult and young state. The strongest of the species prey upon the weaker, and are the most merciless destroyers of their own kind.[*] The weasel and the terrier are the most efficient rat-killers, as the first can pursue the enemy to his most secret retreat, and the second derives from his superior strength and activity, a very decided advantage in the contest. The cat, though in general a very useful auxiliary in lessening the number of this species, is very liable both to be foiled and worsted in her attempts. As these rats bring forth from twelve to eighteen at a litter, we have good reason to rejoice that so many animals have an instinctive animosity against so noxious a marauder. The cunning of these rats is not less than their impudence; it is almost impossible to take them in traps, after one or two have been thus caught, as the rest avoid it with scrupulous care, however tempting may be the bait it contains. The surest way to remove them is by poison, which, however, they frequently detect and avoid. The powder of *nux vomica*, mixed with some wheat flour, or oatmeal, and scented with oil of rhodium, is found very effectual in destroying them. Arsenic is very commonly used in the same way for this purpose; but the fatal accidents which frequently occur when this poison is kept about the house, in consequence of the label being either removed or changed, and the arsenic administered to members of the family instead of some other medicine, render it a very objectionable resource. The brown rat measures about nine inches, and is of a light brown colour, intermingled with ash and tawny. The colour of the throat and belly is of a dirty white, inclining to gray. It has pale, flesh-coloured, naked feet, with a tail of the same length as the body, and covered with small dusky scales, with short hairs thinly scattered between.—The *black rat* was much more common previous to the introduction of the brown rat than at present. It is now found only in situations to which the brown rat has not extended, and is almost as injurious and destructive, resembling it closely in manners and habits. It is of a deep iron-gray, and indeed nearly of a black colour above, and of an ash colour on the lower parts of its body. Its legs are nearly naked, and on its fore feet, instead of the rudimental thumb, it has a claw. The length, from the nose to the root of the tail, is seven inches; the tail itself is almost eight inches long. It has been a matter of dispute, whether this animal was introduced into Europe from America, or was originally taken hence to that quarter of the world. Blumenbach, who has devoted much attention to the subject, states it as his opinion that the black rat was carried from Europe to America. Garcilaso de la Vega states, that it was first introduced into South America by the Europeans, about the year 1544, and Geraldus Cambrensis speaks of them in Europe previous to the discovery of America.

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[*] "It is a singular fact in the history of these animals, that the skins of such of them as have been devoured in their holes have frequently been found curiously turned inside out, every part being completely inverted to the ends of the toes. How the operation is performed it would be difficult to ascertain; but it appears to be effected in some peculiar mode of eating out the contents."—Bewick, *Hist. of Quadrupeds.*

RATAFIA. See *Liqueur*.

RATAN (*calamus*); a genus of palms, but widely differing in habit from the rest of that family, and, in this respect, somewhat resembling the grasses. The species have all perennial, long, round, solid, jointed, unbranching stems, extremely tough and pliable, often ascending among the branches of trees, but without prickles or tendrils. They grow in profusion along the banks of rivers in tropical Asia and the neighbouring islands. All the species are very useful, and are applied to various purposes: the fruit and young stems of all furnish nutriment, and a drink is obtained from the liquid which flows from wounds made in the spadix. One species is even cultivated for its fruit, which is about the size of a walnut, and covered with scales. Certain species furnish cables, cords and withes of exceeding strength; others are split into strips for making the seats and backs of chairs, baskets, and other light and elegant articles of furniture; those which are larger and firmer, and whose joints are more distant, afford elegant walking-sticks; in short, the economical purposes to which the various species of ratans are applied, are very numerous, even in northern climates. A trade in ratans, to considerable extent, is carried on from several of the East India islands to China, which is the principal market for them.

RATE; the name of the classes into which ships of war are divided in the navy, according to their force and magnitude: thus the *first rate* comprehends all ships of 100 guns and upwards; *second rate* includes all ships carrying from 90 to 98 guns, upon three decks; *third rate* consists of ships from 64 to 80 cannon; *fourth rates* consist of ships from 50 to 60 guns, upon two decks and the quarter-deck. All vessels of war under the fourth rate are usually comprehended under the general names of *frigates*, and never appear in the line of battle. They are divided into two rates, viz. *fifth rates*, mounting from 32 to 40 or 44 guns; and *sixth rates*, of from 20 to 30 guns.

RATEL (*ratelus mellivorus*); a species of animals allied to the gluttons, inhabiting the southern part of Africa. It lives on honey, which it procures in great quantities, the bees in that part of the country making their nests in burrows in the ground, which have been deserted by some animal. Sparrman gives an extraordinary and almost incredible account of its sagacity, viz. that it will ascend the highest part of the desert it inhabits to look about, placing one foot above its eyes, to prevent their being dazaled by the sun. The reason he assigns for its choosing this elevated situation is, that it may the better hear and see the honey guide cuckoo, which lives on bees, and serves as a guide to their hives. From the toughness of its hide and the stiffness of its hair, it is admirably defended, not only from the stings of bees, but also from the attacks of more formidable adversaries. The ratel has a blunt nose; no external ears; a rough tongue; short legs, furnished with long and straight claws, deeply grooved beneath: the crown of its head and upper part of its body is gray; the rest is black, except that from each ear a dusky line extends to the tail. The length of the body is forty inches; of the tail, twelve; of the anterior claws, an inch and three quarters.

RATION, in the army; a portion of ammunition, bread, drink and forage, distributed to each soldier for his daily subsistence, &c. The officers have several rations, according to their quality and the number of attendants they are obliged to keep.

RATIONALISM, in the philosophy of religion; opposed to *supernaturalism*. Both words are chiefly used in Germany See *Supernaturalism*.

RATISBON (in German, *Regensburg*), one of the most ancient cities in Germany, built by the Romans, and called *Reginum*, or *Castra Regina*, was, as early as the second century, a commercial place, as appears from an inscription on a temple brought to light by K. T. Gemeiner. Under the Agilolfingians, it was the capital of Bavaria. After the deposition of this dynasty, it was under the immediate protection of the German kings. It underwent several changes, and, in 1663, was made the permanent seat of the diet of the German empire, and so continued until the dissolution of the same. In 1803, the city and the bishopric of the same name were given to the elector of Mayence who was now styled "arch-chancellor of the empire." The city and bishopric were made a principality, and the former see of Mayence transferred to Ratisbon. When the prince-primate was made grand-duke of Frankfort by Napoleon (in 1810), the principality was given to Bavaria. Ratisbon has, at present, 26,100 inhabitants (mostly Lutherans), and is the chief place of the circle of the Regen. The city lies in a fertile valley, at the confluence of the Danube and the Regen. A bridge 1091 feet long (built in 1135—46) leads over the Danube. The buildings are old; the streets crooked, but clean. The city hall, in which the diet used to assemble, with the library, the cathedral, and several other public buildings, deserve mention. There are several good schools and learned societies. The manufactures consist chiefly of pottery, bleached wax, soap, beer and brandy. Yarn is here dyed Turkish red. There is also considerable commerce. Near the city is the monument, which the late archbishop and prince-primate, Charles von Dalberg, erected in 1817 to the memory of Kepler, who died here, Nov. 5, 1630. Respecting the battle of five days (from April 19 to 24, in 1809), near and in Ratisbon, see *Eckmühl*. On the 23d, the city lost 134 houses by fire, and the loss of property by pillage was estimated at 1,500,000 florins. Lat. 49° 0′ 53″ N.; and lon. 10° 6′ 23″ E.

RATLINES; small lines which traverse the shrouds of a ship horizontally, at regular distances from the deck upwards, forming a variety of ladders whereby to climb or to descend from any of the mast heads.

RATTAN. See *Ratan*.

RATTANY OR RATANHIA ROOT; the root of the *krameria triandra*, a plant belonging to the order *polygalea*, and growing wild in the mountains of Peru and Chili. It is a powerful styptic, and various marvellous properties have been attributed to it. The plant has lately been brought into Europe, and probably will succeed in temperate climates. It is not yet in the English catalogues of introduced plants.

RATTLESNAKE (*crotalus*); a genus of American serpents, celebrated for the danger which accompanies their bite, and for the peculiar appendages to their tail. The scientific name *crotalus* is derived from κροταλον, a bell, rattle, or cymbal. The head is broad, triangular, and generally flat in its entire extent. The eyes are very brilliant, and provided with a nictitating membrane; the mouth very large, the tongue forked at its extremity. The body is robust, elongated, cylindrical, covered above with carinated scales. The tail is short, cylindrical, and somewhat thick. The number of the little bells which terminate it, increases with age, an additional one being formed at every casting of the skin. These bells are truncated, quadrangular pyramids, received within each other in such a manner that only a third part of each is visible, the tip of every bone running within two of the bones below it. Thus they are united by a kind of ball and socket joint, and move with a rattling sound whenever the animal agitates its tail. The noise resembles that made by rumpled parchment, or by two quills of a goose rubbed smartly against each other. The poison fangs are traversed by a canal for the emission of the poison. These fangs, when not used, remain concealed in a fold of the gum; when the animal bites, the fangs are raised. They are two in number, one at each end of the upper jaw. The *crotali* have a fœtid odour; hogs feed upon them, but most animals, especially horses and dogs, dread them. Their principal food is birds and squirrels. They also devour rats, hares, and small reptiles. Their glance has been said to have the power of fascinating their prey so as to make it drop into their mouths; it is probable, however, that they only seize it during the terror and confusion which the sight of them occasions. They creep slowly, and do not bite but when provoked, or for the purpose of destroying their prey; and they sound their rattles some time before attacking their assailants. When seized by the head, they cannot like other reptiles raise their tails and twist themselves round the arm, nor make use of their strength to disengage themselves. They usually rest twisted in a spiral form in the customary paths of wild animals, particularly in those which conduct to the water. The remedies employed against the bite of the rattlesnake, are suction and ligatures, caustics and internal medicines. All the species of *crotali* whose country is well known, are confined to America; and the individuals of this genus have diminished in proportion to the increase of population. Bartram says, that he has seen some rattlesnakes as thick as a man's thigh, and more than six feet long. When the winter is rigorous, the *crotali* pass some time in a lethargic state, near the sources of rivers, in covert places, where the frost cannot reach them. They bury themselves thus, before the autumnal equinox after they have changed their skin; and do not emerge until after the vernal equinox. Many of them are often found together in the same hole. Till the month of July, their bite is comparatively harmless. At Cayenne, and in the hot latitudes, they are in constant activity all the year. They are viviparous, and can live a long time. Some have been mentioned as having forty or fifty pieces in their rattles, and being from eight to ten feet in length. They have great tenacity of life. The *crotalus horridus*, Lin. (banded rattlesnake), is a native of Mexico and South America, and is generally from four to six feet long. The *crotalus durissus* (striped rattlesnake of Shaw) inhabits the temperate countries of North America as far as the forty-fifth degree of latitude; it traverses with ease rivers and lakes by swimming, swelling out its body like a bladder. *Crotalus miliarius* (miliary rattlesnake) is an inhabitant of Carolina, is of small size, and not easily perceived; it is fond of remaining coiled up on the tops of the roots of large trees, or the fallen trunks; lives on frogs, insects, worms, &c.

RAUCOURT, Sophia, a French actress of eminence, whose proper name was Saucerote, was born at Nancy, in 1756, and was the daughter of a theatrical performer. She first appeared on the stage at Paris, in 1772, in the character of Dido, and soon acquired great professional reputation, which she enjoyed till 1776, when she suddenly fled from France to avoid her creditors. Having returned to the Paris stage in 1779, she continued to be one of its principal ornaments, till her imprisonment during the reign of terror, in 1793. She was discharged after six months' confinement, but experienced other persecutions till she obtained the protection of Napoleon. Madame Raucourt died January 15, 1815.

RAVAILLAC, Francis, the murderer of Henry IV. of France, born at Angoulême in 1578, pursued the practice of law, and, at the same time, instructed the children of his native place. His naturally gloomy disposition degenerated into a wild fanaticism, when he began to meddle in religious controversies, which, at that time, continued to distract his unhappy country. Filled with hatred of the new doctrines, he became accustomed to consider the good and humane Henry as the arch enemy of the church, to destroy whom would be a meritorious work. May 14, 1610, he succeeded in his purpose. (See *Henry IV*.) He was seized, condemned to death, and underwent his sentence on the 27th of May. He died under the severest torments of more than an hour's duration, which he endured with tranquility, as he had done the rack, and without betraying any especial repentance, or naming any accomplices.

RAVELIN, in fortification, was anciently a flat bastion, placed in the middle of a curtain, but is now a detached work, composed only of two faces, which make a salient angle, and raised before the curtain on the counterscarp of the place. A ravelin is a triangular work, resembling the point of a bastion with the flanks cut off.

RAVEN. See *Crow*.

RAVENNA; one of the oldest towns in Italy, in the Romagna (States of the Church), capital of a delegation of the same name, forty miles east of Bologna; population 16,000. Ravenna was formerly the residence of the Western Roman emperors, and, after the fall of the Western empire, of the Gothic kings, and still later of the exarchs. (See *Exarchate*.) In 752, it was captured by the Lombards, from whom it was taken by the Frankish king Pepin, and bestowed, with the exarchate, on the pope. From 1440 to 1508, it was in the hands of the Venetians, from whom it was taken by the league of Cambray. Since that time it has belonged to the papal see. It is surrounded with marshes, which, however, have in modern times been partly drained. It had formerly a fine port on the Adriatic, which has been filled up by the accumulation of mud; and the city, though still occupying its former site, is now three or four miles from the sea. In the neighbourhood, towards Forli is the field of battle, on which Gaston de Foix gained a victory over the Spanish and papal troops (1512), and fell. The bones of the emperors Honorius, Constantine, and Valens III., of Galla Placidia, daughter of Theodosius the Great, and of Dante, lie in Ravenna.

RAWDON, LORD. See *Hastings, Francis*.

RAY. The ray, in ichthyology, is a genus of fishes, of which the generic character is that it has fine oblique spiracles on each side, placed beneath the neck; the head is small, pointed, and not distinct from the body; the mouth is beneath, transverse, toothed; the body is broad, thin and flat. The individuals of this genus are all inhabitants of the sea only: they keep at the bottom, and in winter cover themselves with sand and mud. They feed on testaceous animals, fish, or any animal substances which they may happen to meet with. They grow to a large size, sometimes exceeding 200 pounds in weight. The females are the larger, and produce their young alive, only one at a time, which are enclosed in a black, quadrangular, horny shell. The eyes are half covered with a thin membrane, oblong, placed in the upper part of the head; above these, in the place of nostrils, is a broad groove, divided by a reticulate membrane, consisting of crested folds, and closed with a valve. Behind this groove are two small semilunar orifices. The tongue is very broad, short and smooth. The ventral fins are covered with a thick skin, and at the base are connected with the anal. The flesh is generally eatable; the liver is larger, and produces no small quantity of pure oil. This genus includes the electric ray or torpedo, and skates, the sting-ray and thornbacks, and other species.

RAY. See *Optics*.

RAY, JOHN, an English naturalist, born in 1628, was the son of a blacksmith, and received his education at Cambridge, where he obtained a fellowship. After the restoration of Charles II., scrupling to sign the declaration against the solemn league and covenant, he resigned his fellowship, and devoted himself to the cultivation of science and literature. In 1667, he was chosen a fellow of the royal society, to whose Transactions he was a frequent contributor. In 1670, he published a Catalogue of English Plants, which was followed by a Collection of English Proverbs, and (1673) an account of a continental tour. He particularly distinguished himself by his improvements in the classification of plants and animals, in his *Methodus Plantarum Nova* (8vo.); *Historia Plantarum* (3 vols. folio); *Synopsis Methodica Stirpium* (8vo.); *Synopsis Methodica Animalium Quadrupedum*; and a *Sylloge Stirpium Europearum extra Britanniam crescentium*; besides which, he published Willughby's Ornithology, and History of Fishes. He was also the author of a popular work entitled, The Wisdom of God manifested in the Works of Creation (8vo.); and of Miscellaneous Discourses concerning the Dissolution and Changes of the World (8vo.) His death took place January 17, 1705. The Philosophical Letters of Ray, and those of his correspondent, were published in 1718, by Dr W. Derham.

RAYNAL, GUILLAUME THOMAS FRANÇOIS, a French writer, was born in 1713, and at an early age entered the society of the Jesuits. He distinguished himself by his eloquence as a preacher, but, in 1748, quitted the society and went to Paris. Here he gained a subsistence by his pen; but his first works (History of the English Parliament, and History of the Stadtholderate) attracted little notice. His *Histoire Philosophique des Etablissemens et du Commerce des Européens dans les deux Indes* (1770) gained him reputation, although he was himself so sensible of its errors and defects, that he took a journey through France, England and Holland to obtain information; and the new edition (1781) was much improved. His free expressions on arbitrary power, priestcraft and superstition, caused his banishment by the parliament, and the condemnation of his book by the Sorbonne. After residing in Germany and Switzerland, he finally received permission to return, and arrived in Paris in 1788. In the early part of the revolution, Raynal, who was not favourably disposed to the democratic principles of the day, was in a critical situation; but, after the fall of the Jacobins, his condition was somewhat improved. He died in 1796. The *Histoire Philosophique* (new edition, Paris, 1820) has been the most celebrated of his works, but is now little esteemed. Raynal also wrote *Révolution des Colonies Anglaises de l'Amérique Septentrionale* (1781.)

RAYNOUARD, FRANÇOIS JUSTE MARIE, a French poet, born in Provence in 1761, was at first an advocate, and sat in the legislative assembly. He first gained reputation by his *Socrate dans le Temple d'Aglaure*, a poem, which obtained a prize from the institute. His principal work is the *Templiers*, a tragedy (1805); the historical matter appended to which, concerning the trial of the Templars, is valuable. In 1807, Raynouard became a member of the institute, and, in 1817, succeeded Suard as perpetual secretary of the academy. In 1816, he published a selection from the poetry of the Troubadours (3 vols.), with which are connected the elements of the *Lingua Romana*, and a grammar of the language of the Troubadours.

RAZEE. A ship of war cut down to a smaller size.

RAZORS. See *Cutlery*.

RE, OR RI; the Egyptian name for the sun, considered as a divinity. See *Hieroglyphics*.

REACTION. See *Mechanics*.

REAL, opposed to the *ideal*, signifies, 1. the same as true, i. e. actually existing; 2. in philosophy, that which exists independently of our ideas or imagination. Hence *realism*, in philosophy, is the opposite of *idealism*, and is that philosophical system which conceives external things to exist independently of our conceptions of them. The external world is differently explained, and realism is divided into different systems, of which that of Spinoza is one of the most important. He supposes one original reality, and teaches that all other things (*substances*) are but modifications of this one real being, which he conceives to be the Deity.—*Realism* becomes *materialism* (q. v.) if it considers matter, or physical substance, as the only original cause of things, and the soul itself as a material substance. Realism is found, also, in dualism. See *Dualism*, and *Idealism*.

REAL. See *Rial*.

REAL INJURIA. (See *Injuria*) *Real injuria*, in German law, is an injury done to the honour of a man by some act of violence, as beating, throwing out of doors, &c. The laws against duels in the eighteenth century imposed heavy punishments on such *injuriæ*, even confiscation of goods, &c. The more modern laws are milder.

REALGAR. See *Arsenic*.

REALISM. See *Real*.

REALISTS; a philosophical sect, opposed to the *nominalists*. (q. v.)

REARGUARD. The office of the rearguard of an army is to cover the retreat. It must be composed of infantry, with artillery, chasseurs or sharpshooters, and of light cavalry; and one species of troops must aid the other, according to the nature of the ground. The cavalry is effectual in a level country; the infantry assists them if they are repulsed, and occupies the narrow passes; while the chasseurs, or sharp-shooters, keep the assailants in check.

REAUMUR, René Antoine Ferchault de, a philosophic naturalist, was born, in 1683, at Rochelle, studied under the Jesuits at Poitiers, and afterwards went through a course of law at Bourges. But his tastes led him to the observation of nature; and, having made himself acquainted with the mathematical sciences, he went to Paris in 1703. His relative, the president Hénault, introduced him to the *savans* of the metropolis; and, in 1708, he was chosen a member of the academy of sciences, to which he had presented some memoirs on geometry. For nearly fifty years he continued to be one of its most active members, his labours embracing the arts, natural philosophy, and natural history. He was appointed to assist in the descriptive accounts of arts and trades published by the academy; and, in executing his part of the undertaking, pointed out the way to various improvements, by the application of the principles of physics and natural history. He made important observations on the formation of pearls, and discovered in Languedoc mines of turquoise (q. v.); but among his most useful researches must be reckoned those of which he gave an account in his *Traité sur l'Art de convertir le Fer en Acier, et d'adoucir le Fer fondu* (1722). As a natural philosopher, he is principally celebrated for the invention of an improved thermometer, which he made known in 1731. (See *Thermometer*.) The fabrication of porcelain also occupied much of his attention, and led him to the discovery of a kind of enamel, called the *porcelain of Réaumur*, in 1739. His *Mémoires pour servir à l'Histoire des Insectes* place him in the first rank of modern naturalists. He died October 18, 1757.

RECIFE; a city of Brazil, capital of the province of Pernambuco, situated at the entrance of the Capibaribe into the Atlantic. The name of *Pernambuco* is applied to the two cities of Recife and Olinda, which are nearly three miles distant from each other. Population of Recife, 25,000; of Olinda, 4000; lat. 8° 4′ S.; lon. 34° 52′ W. Some parts of Recife are handsomely built, with broad but unpaved streets, and several neat squares. Among the public buildings are an episcopal palace, several handsome churches and convents, hospitals, a theatre, &c. The upper harbour (Mosqueiro) is formed by a chain of rocks running parallel with the city. The lower harbour (Poço) is capable of receiving ships of 400 tons burthen, but is exposed. The commerce, which is extensive, is rapidly increasing. The environs are fertile, and are adorned with many fine gardens and country-seats. The heat of the climate is tempered by sea-breezes, but changes of temperature are very sudden.

RECITATIVE (Italian *recitativo*); a species of musical recitation, forming the medium between song and rhetorical declamation, and in which the composer and performer, rejecting the rigorous rules of time, endeavour to imitate the inflections, accents, and emphasis of natural speech. But, though the rules of time and rhythm are not to be strictly observed, the recitative is written in time, and generally in $\frac{4}{4}$ time. In its approach to speech, therefore, the recitative is mostly syllabic song, i. e., each syllable has generally but one tone, and the tones themselves are less prolonged than in *song* strictly so called. Hence the recitative has not a distinct, developed melody, and a regular modulation; it may, according to the meaning of the words, pass with comparative freedom through the various tones. On the other hand, the tones of the recitative are generally musical tones, of distinct height or depth (we say generally, because in the *recitativo parlante*, in the *opera buffa*, the tones become completely those of speech). When the recitative approaches still more to the strict song, in respect to time and melody, the *arioso* originates. In short, the recitative may be called a *declamation in musical tones*. Such a declamation requires a language between prose and lyric poetry. The recitative consists mostly of narrative and of poetical reflection; but it is capable of passing quickly from subject to subject, serves for dialogue, and to prepare important changes in great musical pieces. For this reason, it is introduced in cantatas, operas, and oratorios, between the songs, and is, as it were, the prose of music. As the music of recitative is free, so the words need not any artificial rhythm. The recitative includes the simple (by some also called the *parlante*) and the accompanied, or, more properly, the *obligato*. In the simple recitative, accompaniment also takes place, but it consists only in simple accords, which are given continuously, or interruptedly. In the *obligato* recitative, the instrumental accompaniment is of more importance. In the recitative, much is left to the singer, in respect to time, rhythm, and melody, which requires in him much musical judgment and knowledge of harmony, in order to agree with the *obligato* accompaniment. The force and beauty of this species of composition depends, in a considerable degree, on the character of the language in which it is used. As that is more or less accented and melodious, the more or less natural and striking will be the recitative. The recitative seems to be much older than the song. Giac. Pesi, Ceccini, and Cl. Monteverde, are celebrated as having introduced the modern recitative, and Cesti and Giacomo Carissimi, masters of the papal chapel, in the first half of the seventeenth century, as improvers of the same. (See the article *Opera*.) Leon. da Vinci and Nic. Porpora are said to have first applied the *obligato* recitative. In the grand and expressive recitative, Gluck and Handel are the chief masters. In the modern opera, Mozart is distinguished, also, in this respect; for instance, in his recitative between Tamino and the priest, in the first act, and the great recitative in Don Juan, "Oh, heaven! what see I?" the latter is *obligato*.

RECKONING, in navigation. See *Navigation*.

RECOGNIZANCE, in law, is an obligation of record which a man enters into before some court of record, or magistrate duly authorized, with particular conditions; as to appear at the assizes, or quarter-sessions, to keep the peace, &c.

RECOIL, or REBOUND; the starting backward of a fire-arm after an explosion. This term is particularly applicable to pieces of ordnance, which are always subject to a recoil, according to the sizes and the charges which they contain. To lessen the recoil of a gun, the platforms are generally made sloping towards the embrasure.

RECONNOITRE (from the French) means, in military language, to inform one's self by ocular inspection of the situation of an enemy, or the nature of a piece of ground. It is one of the most important departments of the military art, and must precede every considerable movement. A penetrating eye, an acute ear, a calm and sagacious judgment, and much knowledge of military operations, are indispensable for reconnoitering with advantage. The commanding general always reconnoitres himself, but he must of course rely much on his aids-de camp, as he cannot go every where himself; nor is he allowed to expose himself so much as is necessary, on some occasions, to obtain the requisite information. The choice of the aids-de-camp is therefore of the utmost importance. Reconnoitering not unfrequently brings on engagements, and considerable bodies of troops often march out to cover the reconnoitering party, and to make prisoners if possible, in order to obtain information from them. The bad success of Napoleon in his last campaigns has been partly ascribed, with much probability, by French writers themselves, to the unceasing activity of the Cossacks, which in many cases prevented the aids-de-camp of the French emperor from obtaining the information which they were commissioned to seek, and induced them to supply from their own invention the deficiences in their observations.

RECORDER; a person whom the chief magistrates of any city or town corporate, having jurisdiction and a court of record within their precincts, associate with them for their better direction in legal proceedings. He is usually a person experienced in the law.

RECTANGULAR FIGURES and SOLIDS are those which have one or more right angles. With regard to the solids, they are commonly said to be rectangular when their axes are perpendicular to the planes of their bases.

RED BAY. See *Laurel.*

RED BOOK OF THE EXCHEQUER is an ancient record, in which are registered the names of those that held lands, *per baroniam*, in the time of Henry II. It has also some things (as the number of hydes of land in many of the English counties) relating to the times before the conquest.

RED BUD. This name is often applied to the *cercis Canadensis.* See *Judas Tree.*

RED CEDAR. See *Juniper.*

RED RIVER, one of the principal branches of the Mississippi, rises at the base of a range of the Rocky mountains, called the Caous mountains, near Santa Fe, in Mexico. There are many streams rising in the same mountains, and flowing separately for three or four hundred miles, and at length uniting to form the Red river. The Blue river, and the False Washita, are the largest branches which it receives within the first four or five hundred miles of its course. Of the tract of country watered by these upper branches, and even of the waters themselves, our knowledge is very limited. The Pawnees are the principal inhabitants of that region. After the river enters Louisiana, the south bank of it is the boundary, for a long distance, between the United States and the province of Texas. From both sides it continues, as it proceeds, to receive large tributaries. A great part of its course is through delightful prairies, of a rich, red soil, and covered with grass, and vines which bear delicious grapes. About a hundred miles above Natchitoches, commences what is called the *Raft.* This is a swampy expansion of the alluvion to the width of twenty or thirty miles. The river divides into a great number of channels, many of them shallow; and for ages these channels have been becoming clogged with a mass of fallen timber carried down from the upper parts of the river. The river finds channels between these extensive masses of timber, and sometimes under them; and there are places where the Raft covers the whole river, so that it can be crossed on horseback. Boats descend by passing round these places. They follow some stream above the Raft, which flows from the river into a distant lake, and then take the outlet by which the lake flows into the river below the Raft. About sixty or seventy miles of the river is thus obstructed. In many places a considerable soil has been formed on the Raft, upon which flourish weeds, flowering shrubs, and willows. This obstruction is of incalculable injury to the navigation of the river, and greatly retards the settlement of the rich and healthful country above it. There is probably no part of the United States, where the unoccupied lands have higher claims, from soil, climate, intermixture of prairies, and timbered lands, position, &c., than the country for nearly a thousand miles above the Raft. Steam boats would ascend to that distance, at moderate stages of the water, if the Raft were removed. The state of Louisiana, and also the general government, contemplate adopting means for its removal. Below the Raft, the river divides into many channels, and fills an immense number of bayous and lakes that lie parallel to it; and the breadth of its principal channel is much less below the Raft than above it. The valley of Red river is three or four miles wide, as far as the Kiamesa, about a thousand miles, following its meanders, from its mouth. It widens as it approaches the Mississippi, and is from six to eighteen miles wide for a great distance from its mouth. Of all the alluvions in the Mississippi valley, none is superior to this. Cotton is at present its staple production, but sugar cane has been introduced, and is expected to succeed better than in any other extensive tract in this valley. The climate and soil, as far as Natchitoches, 200 miles, seem admirably adapted to it. The alluvions of the lower branches of the river are also of similar quality. This valley spreads from west to east; its waters, therefore, never become cold, like those of the Mississippi; the winters are milder, and spring advances much earlier than at New Orleans; and the sugar cane will probably grow better in lat. 31° on Red river and its branches, than in lat. 30° on the Mississippi. The cotton also of this region is the best in the United States, excepting the sea-island. Its indigo and tobacco are the best in Louisiana. The whole length of this noble river is estimated at 2500 miles, following its meanders, and it enters the Mississippi in about 31° 15′ north latitude. It probably discharged its waters into the gulf of Mexico, at some former period, without uniting with the Mississippi; and the Atchafalaya now occupies its former channel. Much of the soil through which the Red river passes in its upper course, is of a reddish colour, which is imparted to the waters, and gives the river its name.

Red river is also the name of a river in the northern part of North America, flowing into lake Winnipeg, and having a course of about 320 miles from the source of its principal branch in Red lake.

RED SEA, or ARABIAN GULF (anciently *Arabicus Sinus*); an extensive gulf of the Indian ocean, dividing Arabia from the opposite coast of Africa, extending in a north-west direction from the straits of Babelmandel to the isthmus of Suez, where it approaches to within sixty miles of the Mediterranean; lat. 12° to 30° N. Its length is about 1400 miles; breadth, where greatest, about 200. This sea was anciently a greater channel of commerce than in modern times. Its navigation is rendered difficult by frequent obstructions from coral rocks either above or under water, by storms, and by the paucity of safe harbours. The principal harbours are Suez, at its head; Cosseir, Suakem, and Massuah on the west side; Jidda, Jambo, Ghonfude, Loheia, Hodeida, and Mocha on the east side. This part of the Indian ocean was called by the Greeks the Erythrean sea, according to some accounts, from a king Erythras, of whom, however, nothing is known. The Greek epithet ἐρυθραῖος. signifies also *red;* hence the appellation *Mare rubrum*, and in English, *Red sea*, not from any such colour in its waters or sands.

REDBREAST (*motacilla rubecula*). This little bird is familiarly known to every child, from the numerous nursery stories, in which it plays a prominent part. The fame of this bird has arisen from its habit of seeking the aid of man during the winter season. During that inclement period of the year, it visits without dread the cottage of the peasant and the palace of the peer, tapping at the windows with its bill, as if to demand an asylum, and repays its hosts by its confidence, gathering the crumbs from the table, and warbling forth its thanks in the softest notes. The moment, however, the spring appears, this familiarity with its protectors ceases, and it again hastens to its native haunts. The redbreast builds its nest at the foot of some shrub, or upon a tuft of grass; it is composed of dried leaves, mixed with hair and moss, and lined with feathers; the female lays from five to seven eggs. Sometimes it covers its nest with leaves, leaving a small passage for egress and regress. The food of the redbreast varies with the season; in the spring it is composed of worms and insects, but in autumn is principally fruit and seeds. Its delicacy in preparing a worm before partaking of it, is somewhat remarkable; it first seizes it by one end in its beak, and beats it on the ground till the inner part comes away; then, taking it in the same manner by the other end, it cleanses the outer part, which is the only portion it eats. From its general familiarity with mankind it has received a *nom de caresse* in almost every nation in Europe; in Britain it is known as the *Robin Redbreast;* in Germany it is termed *Thomas Gierdet;* and in Norway, *Peter Ronsmad*.

REDEMPTION, EQUITY OF. See *Equity of Redemption*.

REDEMPTORISTS; an order founded by Liguori, and restored in Austria in 1820. Beside the usual monastic vows, they bind themselves to labour for the propagation of the Catholic faith, by the cure of souls, and the education of youth.

REDONDILLAS signified formerly a species of versification used in the south of Europe, consisting of a union of verses of four, six, and eight syllables, of which generally the first rhymed with the fourth and the second with the third. At a later period, verses of six and eight syllables in general, in Spanish and Portuguese poetry, were called by this name, whether they made perfect rhymes or assonances only. These became common in the dramatic poetry of Spain.

REDOUBT, in fortification; a small square work without any defence but in front, used in trenches, lines of circumvallation, contravallation, and approach, as also for the lodging of *corps de garde*, and to defend passages. They are usually figures of three, four, five, or six sides, encompassed with a ditch and a bank of earth, which consists of two parts, called *rampart* and *parapet*.

REED. This term is usually applied indiscriminately to all tall, broad-leaved grasses which grow along the banks of streams, and even to other plants, with similar leaves, growing in such situations. Strictly speaking, it belongs to the genus *arundo*, and especially to the *A. phragmites*, the largest grass of northern climates, and one of the most universally diffused. This grass grows in marshes, often occupying exclusively certain tracts, and attains the height of eight or ten feet, with leaves one or two inches broad, and bears large, nodding, silky panicles. It flowers in July. It is used in many countries for various economical purposes, as for thatching, for protecting embankments or sea-dikes, for ceilings to cottages, &c., for screens, or fences, and hotbed covers in gardens, for chair-bottoms, for weavers' combs, &c. The flowers afford a green dye, which is occasionally used for colouring woollens; and it is said that flour may be made from the dried roots, capable of being converted into a wholesome and nutritive bread.

REED-BIRD. See *Rice-Bunting*.

REEF; a certain portion of a sail comprehended between the top or bottom and a row of eyelet holes, generally parallel thereto. The intention of the reef is to reduce the surface of the sail in proportion to the increase of the wind; for which reason there are several reefs parallel to each other in the superior sails; thus the top-sails of ships are generally furnished with three reefs, and sometimes four; and there are always three or four reefs parallel to the foot or bottom of those main-sails and fore-sails which are extended upon booms.

Reef also implies a chain of rocks lying near the surface of the water.

REEFING; the operation of reducing a sail by taking in one or more of the reefs.

REEL; a lively Scotch dance, generally written in common time of four crotchets in a bar, but sometimes in jig-time of six quavers.

REELING. See *Silk Manufacture*.

REES, ABRAHAM; a dissenting clergyman, born in Wales, in 1743. Being intended for the ministry, he was placed at the Hoxton academy, where his progress was so rapid that, in his nineteenth year he was appointed mathematical tutor to the institution, and, soon after, resident tutor, in which capacity he continued upwards of twenty-two years. In 1768, he became pastor to the Presbyterian congregation of St Thomas's, Southwark (since removed to Stamford street), and continued in that situation till 1783, when he accepted an invitation to become minister of a congregation in the Old Jewry, whose spiritual concerns he superintended till his death. On the establishment of the dissenting seminary at Hackney, in 1786, Dr Rees was elected resident tutor in the natural sciences, which place he held till the dissolution of the academy, on the death of Dr Kippis. In 1776, he was applied to by the proprietors of Chambers' Cyclopædia to superintend an enlarged edition of that compilation, which, after nine years' incessant labour, he completed in four folio volumes. The success of this work led to a new undertaking, similar in its nature, but more comprehensive in its plan, projected and carried on by him under the title of the New Cyclopædia (45 vols., 1802—20; republished at Philadelphia, in 47 vols.). Dr Rees obtained his degree from the university of Edinburgh. He was also a fellow of the Royal and Linnæan societies. His death took place June 9, 1825.

REEVE, CLARA; born at Ipswich, in 1738, and died there in 1808. She possessed great learning and research, which she displayed in a translation of Barclay's Latin romance of Argenis, under the title of the Phœnix, or the History of Polyarchus and Argenis (1772); and the Progress of Romance. Her other works are the well-known tale of the Old English Baron; the Two Mentors; the Exile; the School for Widows; a Plan of Education; and Memoirs of Sir Roger de Clarendon (4 vols.).

REEVING, in the sea language; the putting a rope through a block. Hence to pull a rope out of a block is called *unreeving*.

REFERENCE. See *Arbitration*.

REFLECTION. See *Optics*.

REFLECTORS. See *Burning Mirrors*.

REFORMATION. The reformation of the church, in its head and members, had become the watchword of all the lovers of morality and religion as early as the fifteenth century. Christianity, which was intended to elevate mankind, and to make them happy, had been diverted more and more, in the hands of its priests, from its original design. The successful endeavours of the Roman bishops to extend their spiritual sway over all Christendom, to direct the actions of kings, and the improvement of society, undoubtedly contributed much, in the confusion of the ages which followed the irruption of the barbarians into Southern Europe, to soften the savage manners of the race which had trampled down the old world, with whatever remained of refinement. The Christian missionaries and Monks sowed the seeds of milder manners in the German forests, and among the northern barbarians, and promoted the civilization of the converted nations. Many beneficial consequences resulted from the unity of faith and worship; from the dependence of all the Western churches on Rome; from that legislative supremacy over the nations which compelled the popes to adopt a settled policy, in the middle ages; and the Roman church may justly claim great merit in regard to the gradual formation of European society. But the church enjoyed her victory with so little moderation; her servants violated so openly in their lives and doctrines, the spirit of their Divine Master, that the opposition to priestly despotism which had early arisen in the East, and had been transmitted through numerous sects to the secret societies of the middle ages, became quite active in the thirteenth century, and grew more violent in proportion as the papal power sought to exterminate it with fire and sword. The question, What is truly Christian, and conducive to human happiness, in the doctrines and usages of the Roman church? must often have been suggested to the minds of sincere clergymen and intelligent laymen. The arrogance of the priests exasperated the princes; the encroachments of the mendicant friars did injury to the secular ecclesiastics; and a thousand innocent victims of the inquisition called for vengeance. Still the authority of the pope over the public mind, even in the fourteenth century, was such as scarcely to suffer the murmurings of discontent to be heard. The writings of Wickcliffe (q. v.) in England soon reached the continent, and aroused Huss (q. v.), with his Bohemian followers. But the fifteenth century was not ripe for a reform, and the papal party was strong enough to suppress every attempt towards improvement, as appears alike from the conduct of the princes and the people at the breaking out of the Hussite disturbances, and from the results of the councils of Constance and Basle. But, soon after, the views of scholars were enlarged by the study of the classics, revived by the emigration of a few learned Greeks; the means of information were vastly increased by the art of printing; materials for thinking were laid before the people by instructive works in the vulgar tongues, and by the new universities, of which seven were instituted in Germany alone, between 1451 and 1502; the number of learned men increased; and the intelligence for which the reformation was to open a way began to act generally and powerfully. The reform which the liberal divines had warmly advised, with little success, now waited but the call of a master spirit. Savonarola (q. v.) arose for this purpose at Florence; but the same funeral pile consumed him and his work together. Some monarchs also attempted something. Charles VIII. of France caused the Sorbonne, in 1497, to declare it expedient that a council should be held every ten years, for effecting reforms in the church, and that otherwise the bishops should assemble for that purpose. Maximilian I. laid before the Roman court the strong remonstrances of the German princes, passed in the diets of 1500 and 1510. By the influence of France, an independent council was held at Pisa in 1511, in spite of Pope Julius II; but although its few speakers conducted themselves with great boldness, it was soon overthrown by its own weakness and by the decrees of the council in the Lateran which was opposed to it in 1512, and which served in the hands of the pope, to palliate his measures anew. In general, in all the plans that had been proposed for the reformation of the abuses of the church on one side political ends had too often been intermixed, and on the other, in the heat of zeal against individual wrongs, the chief faults in the doctrine and discipline of the church, from which all the other evils originated, had been too much overlooked. Hence nothing took place but fruitless disputes and violent persecutions of the innovators, or futile political negociations, in which the pope always prevailed in the end. The services of Reuchlin (q. v.) in the cultivation of the Greek language, and his victory over the opposers of learning in Cologne, had an important effect. The cultivated taste and the sound understanding which appeared in the writings of Erasmus, addressed to the most distinguished men in church and state, exerted a wide influence, and promoted both the cultivation of classical learning and the diffusion of liberal views on the subject of religion. Of still greater power over the mass of the people was the host of satires, epigrams, caustic allegories, and coarse jokes, at the expense of the church and the monks, from Reynard (q. v.) the Fox to the more delicate raillery of these two scholars, who were not ardent nor bold enough to take a decisive step. Thus by the concurrence of favourable circumstances, and by the progress of a new spirit struggling for light and freedom, the way of truth was gradually laid open. The centre of Europe, together with the north, which had long submitted with reluctance to Rome, was ready to countenance the boldest measures for shaking off the priestly yoke, of which the best and most reflecting men had become impatient. But no one anticipated the quarter whence the first blow would be struck. Frederick III. elector of Saxony, a wise prince, but a zealous Catholic, and a great collector of relics, only followed the example of other German princes in establishing a university at Wittenberg (1502), whither, among other learned men, he invited Martin Luther, an Augustine monk of Erfurt, to be professor of theology. This man—of a powerful mind, and distinguished more for his deep piety, and strong love of truth, than for extensive erudition—was well acquainted with the Holy Scriptures, and, by a visit to Rome, in 1510 on some business of his order, had also become acquainted with the corruptions of the papal court. Leo X was created pope in 1513. Little affected by the universal desire for reformation in the church, he seemed placed at its head merely to employ its revenues in the gratification of his princely tastes. Albert, elector of Mentz and archbishop of Magdeburg, a prince of a similar character, received from Leo, in 1516, permission to sell indulgences within his own jurisdiction, on condition of sharing the profits with the pope. In this traffic, Albert employed among others, John Tetzel, a Dominican monk of Leipsic, experienced in the business, who went about from place to place, carrying on his trade with the most unblushing impudence, and extolling his certificates above the papal bulls, (which required repentance) as unconditional promises of the forgiveness of sins in time and eternity. The buyers were numerous, and the gain great; for the illiterate people still venerated highly their ancient superstitions; and the easy absolution from the deepest guilt, and relief from temporal penance and eternal punishment, for a few groschen, were alluring to the rude multitude. (See *Indulgence*.) When Tetzel commenced his traffic at Juterbogk, in 1517, purchasers flocked to him from Wittenberg, which was in the neighbourhood, and there, showing their certificates to their confessors denied all necessity for new penances. Luther set his face against this abuse, first in his sermons, (for he performed the duties of a preacher, as well as professor,) and afterwards, (in order to prepare the way for an academic disputation on the subject according to long established usage,) in ninety-five theses, or questions, which he affixed to the door of the great church, October 31, 1517. In these he declared himself warmly against the abuse of indulgences, displayed a lively zeal for the Holy Scriptures, and for the honour of the church and the pope, and concluded with a prayer for instruction. His sermons on indulgences were published in German, and, in a few weeks, were spread over all Germany. His theses were in Latin, and were soon spread through other Christian nations. Luther also urged his spiritual superiors and the pope, to put a stop to the traffic of Tetzel, and to reform the corruptions of the church in general, in letters at once bold and respectful. With the exception of Scultetus, bishop of Brandenburgh, no one made him a becoming answer. On the contrary, the most absurd libels, full of extravagant assertions of the power of the pope and his indulgences, were brought forward by Tetzel, (in whose name Conrad Wimpina, professor of theology at Frankfort on the Oder, took up his pen,) by the Augustine Sylvester Prierias, a courtier of the pope at Rome, and by Jacob Hogstraaten, the supreme inquisitor at Cologne, who had been rendered contemptible by his dispute with Reuchlin; but these, and the virulent Notes of Eckius (Eck) of Ingolstadt, against Luther, were too miserable to escape the ridicule of the well informed, and only drew attention to his bold enterprise. The severe replies, in which he exposed the weakness of these advocates for indulgences, and his *Resolutiones*, by which he illustrated his theses, gained new victories to the truth. A disputation which he maintained in an Augustine convent at Heidelberg in 1518, on the merit of good works, and the use of the Aristotelian philosophy, gained him friends among the young theologians present, as Bucer, Brenz (Brentius), and others who afterwards became celebrated as zealous advocates of reformation. The conferences of Luther with the papal legates, Cajetan, in 1518, at Augsburg, and Miltitz in 1519, at Altenburg, in which those prelates, instead of bringing him to recant, as they were ordered, only showed their inability to support the Roman doctrines on the authority of the bible; the scholastic discussion of Eck with Carlstadt and Luther, at Leipsic, in 1519, which lasted three weeks, and in which they warmly discussed the doctrines of freewill, the authority of the pope, indulgences and purgatory, though they decided nothing attracted a more general attention to the works of Luther, who almost every month sent forth new pamphlets and printed sermons. From the Pyrenees to the Vistula, from the gulf of Venice to the Belt, every thing by Luther or about him was eagerly read. The remarkable fulness and power of his style; his merciless humour; his acuteness and learning daily increasing by his constant historical and exegetical studies; the irresistible force of his reasoning; and above all, the adaptation of his doctrines to the wants of the age; the approbation of Erasmus, Pirkheimer, and other distinguished scholars; the public adherence of men like Melanchthon and Hutten; the contemporaneous, and yet bolder opposition of Zuinglius and Œcolampadius, in Switzerland, to indulgences and the papacy—(see *Reformed Church*)—made this man, who was hardly known before 1517, the champion of all enlightened men who lamented the degeneracy of the church of Christ; and as such he now spoke and acted with admirable courage. The respect for the Roman court, which was perceptible in his earlier writings, he now discarded as the injustice of the papal pretensions had become clear to him. A glowing zeal, such as had been seen in the time of the apostles, characterized his masterly writings, addressed to the nobility of Germany, on the mass, on the Babylonish captivity, and on the freedom of a Christian. In these works he attacked the papal doctrines with the weapons of the word of God, and directed attention to the nobler but forgotten doctrines of the gospel. In 1520, when Eck published the papal excommunication against him in Germany, he appealed to a general council; when his works were burnt at Mentz, Cologne and Louvain, he publicly committed the bull of excommunication, with the papal canons and decrees, to the flames (December 10) amidst the rejoicings of the students at Wittenberg. This year and the following, 1521, are, therefore, to be regarded as the true period of the reformation in Germany; for at this time, Luther formally separated from the Roman church, and many of the principal nobles—Hutten, Sickingen, Schaumburg, &c.,—the most eminent scholars, and the university of Wittenberg, to which the young men of Germany and other countries now flocked in multitudes, publicly declared in favour of his undertaking. His commanding appearance, and his bold refusal to recant at the diet of Worms, (April 17, 1521,) the day of his proudest triumph, (see *Luther*,) gave him the power and dignity of an acknowledged reformer; the edict of Worms and the ban of the emperor, made his cause a political matter. We must not, however, overlook the circumstances which favoured the progress of reformation. The pope had risen chiefly by the support of Germany; in his transactions with the emperor, he had generally been supported by the German princes, who thus maintained their own independence. Rome had, therefore, been obliged to court them in turn, and the emperor congratulated himself in silence, if disputes ensued between them. On the death of Maximilian I. in 1519, the elector Frederic III., who was already the most powerful German prince, held the dignity of a vicar of the empire in all the Saxon territories, and his personal influence gave him the most decisive voice in the election of the new emperor. The pope, as well as Charles V., who was chosen chiefly by his influence, in 1520, was obliged to consult his wishes: the former in changing the original summons of Luther to Rome, to a conference with his legates, and the latter in suffering the reformation to go on without violent opposition, as long as it allowed itself to be responsible to the pope and the Catholic States. By his ten months' residence in the Wartburg, Luther was secured from the first consequences of the ban of the Empire, and the edict of Worms had so much the less force in Saxony, as the emperor, engaged in 1521, in the war with France, or occupied in Spain, almost wholly lost sight of religious affairs in Germany, and each prince did what he pleased in his own territory. But that Frederic the Wise, although he did not call himself an adherent of the reformers, yet protected the heroes of the reformation, is easily explained from the concern which he took in the prosperity of the Wittenberg university, from his uprightness, his gradually increasing conviction of the justice of the views of Luther and his friend Spalatin, who managed every thing at the court of Frederic. Leo's successor, Adrian VI, who was himself desirous of a reformation, in answer to his demand for the extirpation of the doctrines of Luther, received a list of a hundred complaints from the German states assembled at the diet of Nuremberg in 1522, in which even the Catholics joined against the papal chair. The people of Wittenberg were, therefore, as little impeded in their attempts at a reform in religious worship (beginning with the mass), as those of Zurich, whose rapid progress in the change of their religious doctrines and rites found the most powerful support in the governments of the northern cantons; and Luther was even obliged to hasten from the Wartburg to quell the tumults excited by the turbulent zeal of Carlstadt. While he was publishing his translation of the New Testament, the fruit of his exile, which was soon followed by the Old, and Melancthon his *Loci Communes* (the first, and, for a long time, the best exposition of the Lutheran doctrines, first published in 1521), serious preparations for the reform of papal abuses were made in Deux-Ponts, Pomerania, Silesia, in the Saxon cities (of which Leissnig was the first after Wittenberg), and in Suabia. Luther's liturgy had no sooner appeared, in 1523, than it was adopted in Magdeburg and Elbingen. The new church was not without its martyrs. In 1522, the inquisition in the Netherlands secured it this honour by the execution of some Augustines, who favoured the new doctrines. Translations of the Bible into French and Dutch now appeared. In the very heart of France, at Meaux, a Lutheran church was organized. In vain did the Sorbonne condemn the principles of Luther; in vain was the execution of the edict of Worms against religious innovations resolved upon at the diet of Nuremberg, in 1524, and the convention of Ratisbon; in vain did George, duke of Saxony, Henry, duke of Brunswick, Austria, France, Spain, and the spiritual princes of the empire, labour to suppress the reformation by the persecution of the followers of Luther in their states. The same year, Luther laid aside his cowl; monasteries were deserted; priests in Saxony and Switzerland married. In 1525, John, successor of Frederic in the Saxon electorate, Philip, landgrave of Hesse, and Albert of Brandenburg, duke of Prussia, publicly declared themselves Lutherans. All their territories, Livonia, a considerable part of Hungary and Austria (Bohemia had already been gained by the Hussites), Lüneburg, Celle, Nuremberg, Strasburg, Frankfort on the Maine, Nordhausen, Brunswick, Bremen, embraced the new doctrines, and a great number of the most respectable clergymen and theologians in Germany followed the example of Luther, who married Catharine von Bora, formerly a nun. Sweden received the reformation in 1527, under Gustavus Vasa, through the labours of Olaf and Lorenzo Petri; and its example was soon followed by the greater part of Lower Saxony and the north of Westphalia, Hamburg and Lubeck. The tranquillity of this period, resulting from the absence of the emperor, during which the reformation advanced with astonishing rapidity, and almost without any impediment, interrupted the dispute of Luther with Zuinglius and Erasmus (see these articles, and *Lord's Supper*), less than the apprehensions of a war, excited in 1528 by the information of a secret alliance of the Catholic states against the Protestant; and violent measures on the part of the latter were with difficulty prevented by Luther's earnest exhortations to peace. This circumstance, however, united the party in favour of reform more closely; and from their general protest against a decree of the diet of Spires, in 1529, they received, in 1541, the name of *Protestants*. They now, therefore, formed a distinct political party (*Corpus Evangelicorum*); and as the emperor returned to Germany at this time in a threatening attitude, they were forced to adopt decisive measures. After the visitations undertaken for the organization of the church system with the aid of Melanchthon's instructions and Luther's catechisms, which appeared in 1529, when the teaching of the people in schools and churches by faithful ministers was gradually improving, Melanchthon was employed to draw up a full exposition of the Lutheran doctrines; which was subscribed by the princes already united by the league of Torgau (1526) and the convention of Schwabach (1529) (see *Schwabach, Articles of*), transmitted to the emperor at the diet of Augsburg in 1530, and solemnly read before a full assembly (June 25), whence the declaration was called the *Augsburg Confession*. (q. v.) The emperor caused a reply from the Catholic party to be read, which was to put the question at rest; rejected the defence (Apology) of the Augsburg confession, written by Melanchthon in answer to this confutation, and insisted upon the suppression of religious innovations. A similar reply was given to Strasburg, Constance, Memmingen and Lindau, which had sent the emperor a similar paper, styled the *Confession of the Four Cities*, or *Confessio Tetrapolitana*. This conclusion of the diet was a new motive of union to the Lutherans. (For a history of subsequent events, see *Smalcaldic League*, *Interim*, and *Peace, Religious*.) The German Protestants were united by common political interests and a common creed, contained in the Augsburg confession, and its Apology (see *Melanchthon*), and illustrated by the articles of Smalcalden and the two catechisms, and finally confirmed, in 1580, by the Form of Concord. (See *Concord, Form of*, and *Creed*.) The Lutherans, or adherents of the Augsburg confession, were the three electors of the Palatinate, Saxony, and Brandenburg, twenty dukes and princes, twenty-four counts, four barons, and thirty-five imperial cities; in all eighty-six members of the empire. Sweden and Denmark (since 1536 a Protestant country), Sleswick, Pomerania, Silesia, and many important cities, on political grounds, Hesse and Bremen, from a preference for Calvinism, refused to adopt the Form of Concord. The Palatinate fell back, and the court of Berlin became Calvinistic (or Reformed). The dispute concerning the presence of the body of Christ in the sacrament of the supper (see *Lord's Supper*), between the Swiss and French Protestants, on one side, among whom, after the death of Zuinglius, Calvin was the champion, and the Saxon Protestants on the other, resulted in a total separation of the reformed church (q. v.) from the Evangelical Lutheran. The foundation of this difference between the two churches, so unfavourable to the progress of the reformation, was deeply laid in the diversity of the characters of their founders. Luther, more accustomed to think systematically, and to adhere implicitly to the letter of the Holy Scriptures, immediately brought every new idea, which was suggested, to the touchstone of his system, and admitted nothing which seemed to oppose that belief. Zuinglius, less trammelled with fixed dogmas, and more ready to follow his own judgment, was, on the other hand, more prompt to embrace those views, which at first sight appeared reasonable to him. Hence he was more in danger of adopting error as truth, while Luther was more apt to reject truth as error, lest he should renounce his faith. The east and north adhered to the opinions of Luther; the west and south followed the more liberal views of the Reformed church. The greater part of Switzerland and Geneva (1535), a great part of the population of France, particularly of the southern part (see *Huguenots*), England (in 1547, with the reservation of the hierarchical dignities, and with a temporary interruption, in the reign of Mary, in 1555—58), Scotland, where Knox introduced the Presbyterian form of church government, in 1560, on the Geneva model, and the United Provinces of the Netherlands, which, at one blow, gained Protestantism and freedom, belonged to the Reformed church. (See *England, Church of*, and *Henry VIII.*; *Knox*; *Netherlands*; and *Creed*.) In Transylvania, the Lutheran confession prevailed; in Hungary, Calvinism entered with it; and in Poland, where the reformation had found numerous adherents (from 1556), the two Protestant parties, with the Moravian brethren, concluded a convention (*consensus*) at Sendomir, in 1750, which united them in one political body, known as the *Dissidents*. (q. v.) The attempt of Gebhard, elector of Cologne, in 1582, to introduce the reformation into his archbishopric totally failed, owing to his want of prudence. Whatever dissensions may have separated the Lutherans and Calvinists at this period, they had, and still have, the fundamentals of doctrine and discipline, the spirit, and the name of true Protestants in common, and every step in the progress of the reformation is to be considered as a gain to both parties. But the ill will which continued to exist between the Catholics and Protestants, even after the religious peace, eventually kindled the thirty years' war, and devastated Germany. The peace of Westphalia established between the parties a legalized toleration; but the Protestant subjects of Catholic princes too often experienced its violation, and the Catholics in Protestant states (as the Irish) not unfrequently suffered a similar fate. (See *Religious Liberty*, and *Catholic Emancipation*.) After this general outline of the history of the reformation, it remains to give some views of the influence which it has exercised on the religion and morals, on the literary and political condition, of nations.

From what has been said, it appears that the reformation was a necessary consequence of the mental progress of the Western, and particularly of the Teutonic nations. The opposition of its enemies gave it consistency and importance. The assaults of passionate and ignorant opposers, the intrigues and violence of the Roman court, and the applause of his whole nation, urged Luther farther than he had thought of going. Circumstances, the concurrence of which human wisdom could neither produce nor prevent, favoured the enterprise beyond his highest hopes. Involved in contests with adversaries whose victory seemed almost certain, and convulsed by internal dissensions (the peasants' war, and the troubles of the Anabaptists), the reformation still made rapid progress. After it had been going on a few years, it no longer depended on its authors for the direction it should take. The influence of Protestant principles has had a large share in bringing about those improvements, which, in modern times, have extended to almost every class of society in Europe. Before the reformation, the doctrines of the church comprised a mass of propositions and precepts, the fruit of circumstances which were intended to support the divine authority of the priesthood, and rested in part on perversions of history; but the great truths which every Christian ought to know, were either neglected or adulterated, and the gospel of Jesus could hardly be recognised. In the view of Catholics, indeed, such of these doctrines as are not founded on the Bible, rest on verbal traditions, which the teachers of the church received from the apostles and fathers, and which the popes or councils, with the aid of the Holy Ghost, gradually made known (see *Tradition*); but their fruits bore no traces of their pretended divine origin. The place of religion was supplied, in the minds of the lower classes, by a mixture of fear and diversion, aided by a service full of mechanical ceremony and superstition. At one time, it was a timid fear of a spiritual being wielding the terrors of temporal suffering and eternal damnation; at another, delight in the ornaments of the churches and their priests; admiration of their splendid, and, for the most part, unintelligible exhibitions; some times the occupation of the imagination with various legends and miraculous histories, and prayers repeated in the order of the beads of the rosary, confessions, penances, fasts, pilgrimages, and rich gifts to the the church of money and other valuables. The ignorance of the common people blinded them to the wretchedness of their spiritual condition; but the better informed soon perceived that the entire reference of the doctrines of the church to the support of the papal power, and of its worship to the visible images of the saints, directed nearly all the devotion of the faithful to things which do not belong to the Christian profession, and in no way promote a sincere reverence of God. No wonder that Christianity, thus perverted, became, in the eyes of many of the most distinguished divines and laymen, whose taste had been formed by the study of the classics, a subject of unmingled contempt. The ecclesiastical princes of Italy used it only as the instrument of their selfish purposes, and opposed with obstinacy a reformation of the church, which they viewed as dangerous and chimerical. An open rupture with the pope gave the reformers the power of throwing off the corruptions and foreign appendages of religion, both in doctrine and worship, and of restoring a Christianity which knows no rule of piety but the Holy Scriptures, asks nothing but faith and virtue, and, instead of being the secret possession of a privileged caste of priests, was laid open to all. The idea that there is something for which man is accountable only to himself and his God; that in religion human authority is nothing; and that it is, therefore, the duty of every one to study the Holy Scriptures, as its source, and to rest his faith on his own convictions; that acts of worship derive their whole value from the faith of the worshippers, and their obvious tendency improve those who take part in them; in short, a living commentary on the doctrine, "God must be worshipped in spirit and in truth," was spread by the preaching, and still more by the writings of the reformers, among the whole mass of the people. Thousands of the scholars of the universities, the friends of philosophy and of classical antiquity, intelligent citizens, and discontented individuals of the lower clergy, had long been ready to share in the dissemination of these principles; princes and nobles, and even some bishops, felt the power of truth; and zeal for innovation was aroused, in the lower ranks, to such a degree, that in some places they aimed at nothing less than to burst all restraints. The success of their first appeals encouraged the reformers to venture the second step towards the restoration of true religion by removing all obstructions to it in the forms of the church. Among these was the mockery of a sacramental consecration of priests, which elevated the sacred office above humanity, made a privileged order the legislators of the faith, and sanctioned every abuse of ecclesiastical power; the worship of saints, relics, and images, which, as it was then conducted, detracted from the reverence of the invisible God; transubstantiation, making the Son of God to be created and sacrificed daily by the hands of men, and thus justifying the worship of the host; extreme unction, and the masses for the souls of the deceased, which drew immense tributes from the fears of the dying and the grief of mourners; and a multitude of other customs, which distracted and degraded devotion. From the superstitious fables and cunning inventions of ambition, the religious spirit now turned to a faith which it might embrace without abandoning the use of reason; for the eternal truths of the gospel, by means of Luther's excellent German translation of the Bible, and accurate versions into other languages, by the sermons and liturgies founded on it in the vernacular tongues, by catechisms and comprehensive manuals, came unadulterated before the world at large. Restored once more to its original destination, the Christian ministry among Protestants devoted itself exclusively to the labour of explaining the Word of God, and applying it to spiritual improvement; of erecting schools for the neglected youth, and raising the character of those already existing, while the clergy renounced the privileges by which they had been distinguished from the laity. Every Protestant partook of the cup in the Lord's supper; every one could understand the simple celebration of divine worship, and could join in the sacred hymns. Thus, wherever Protestantism found its way, the worship of God recovered that simplicity, and warmth, and sincerity, which had characterized it among the first Christians. It became a common work, and a bond of union, in proportion as the feeling of obligation to defend the newly acquired purity of religion from dangers and attacks from without, fanned the flame of religious zeal, and strengthened the love of brethren in the faith; hence a clearer knowledge of God, and a higher tone of piety. Religion was no longer a mere subject of the imagination, but appealed to the reason and feelings of men, and invited close investigation. Not that this beneficial influence became at once universal and complete, or was interrupted at no period of the advance of Protestantism; the best ideas, the wisest institutions, succeed only by degrees, and are never carried into execution without the alloy of human weaknesses. If we carefully examine the period of the reformation, and the spirit which animated its first friends, we shall find it a time of contest and division, when the silent operation of the new light was blended with violent hostility towards false brethren and ever-active enemies. Hence the abusive language from the pulpits and in controversial writings, which, though abundantly provoked by the menaces, violence and intrigues of the opposite party, and excusable on account of the rude tone and contentious spirit of the age, was, nevertheless, always unfavourable to the improvement of Protestantism. Hence the extravagances of precipitate innovators, which the reformers could not resist without retaining more of the forms of the existing religion, out of regard to the consciences of the weak, than a strict application of their principles would permit. Hence that war of opinions among divines, which not only prevented the co-operation of the Swiss with the Saxon reformers, but also gave an accidental importance to certain points of comparatively small importance, which, in the future system, especially of the Lutherans, occasioned great incongruities, and left deep traces of the time of their origin. The absurd *adiaphora* (q. v.), so called, gave rise to violent disputes. Altars, candles, images, mass-dresses, surplices, wafers, auricular confession, exorcism, and even the position of the words *Vater unser* (Our Father, in the Lord's prayer), instead of *Unser Vater*, became the distinguishing signs of the Lutheran party. These contests, however, must be admitted to have had a salutary influence on the settlement of particular points of doctrine, and to have contributed to excite a lively zeal for religion. In the period subsequent to the reformation, deep religious feeling always remained the characteristic of the Protestants. There was, however, a difference between the two principal parties; for the circumstance that the Lutherans still made the Lord's supper a mystery, while the Calvinists submitted every thing to reason, produced an essential variance in their religious feelings. But that levity and infidelity which were fostered by the indifference of many eminent Catholics in Italy and France, scarcely ever found admittance into either party. They thought too highly of their faith, they were too deeply convinced of its truth, to regard any thing holy with indifference; they were ready, if necessary, to sacrifice their property and lives in the cause of religion. And this religious feeling was nourished by the affecting solemnity of the devotional exercises, which assembled the faithful in their churches, and, in the stillness of the domestic retreat, collected families around their fathers. Rich treasures of passages from the Bible were laid up in retentive memories, with many striking hymns, of which no church ever possessed more than the Protestant church in Germany and France. They passed from mouth to mouth: in business, and in all the vicissitudes of fortune, they were companions and comforters. They did more injury to the pope, as even the Catholics confess, than the most elaborate writings of the reformers. The diligent study of the Bible, and the didactic works of Arndt and other ascetics, at a time when a spirit of contest had usurped the sacred desk, made up to many the want of ingenious and powerful sermons. Through the influence of Spener, the religious character of the Lutheran church gained new life.

The reformation also had an important influence on *morals*. While the reformers abolished the principle of blind obedience to the pope and other ecclesiastical dignitaries, denied the merit of what were called *good works* (penances, fasts, alms), and the opinion that the outward observance of the precepts of the church was virtue, and rejected the possibility of acts of supererogation, by which (as was taught by a decree of 1342) saints had enriched the treasury of the church, they again awakened the smothered moral feelings of men, and introduced that more elevated morality which requires holiness of heart and purity of conduct. With the prevalent errors in morals were connected usages which, though probably well-meant in their origin, had terminated in the greatest corruption—auricular confession, which was employed as an instrument of tyranny over the consciences and private affairs of laymen; penances, or ecclesiascal punishments, which were imposed on offenders; and indulgences, by which they purchased, at no small price, permission to sin; pilgrimages, which great numbers of the unhappy undertook, to seek absolution from wonder-working images, and to indulge in promiscuous excesses. While the reformers wholly suppressed these abuses, which made the remission of sins venal in the eyes of the people, they deprived licentiousness of the support of legal toleration, and directed penitents to seek for reconciliation with God only by faith and new obedience. They exhibited in its true vileness that gloomy asceticism, which represented inhuman self-torture, solitude, poverty, nakedness, filth, hunger and misery, and even privileged beggary and idleness, as pleasing to God, and steps towards the highest perfection: they threw open the monasteries, discharged monks and nuns from their vows, and permitted marriage to the teachers of religion. At one blow, the workshops of superstition, and the abodes of secret sins and private cruelties, were destroyed; a multitude of unhappy beings were set at liberty and restored to mankind; and the flames of a passion which had destroyed the peace of thousands of noble natures, or sated itself by the seduction of innocence, were reduced to the limits of moderation, and made to promote domestic happiness. Thus, by the abolition of celibacy and monasticism, the reformers restored to nature the rights which make it the nurse of virtue. But what places the merit of the reformation, in regard to morals, in the clearest light, next to removal of those obstructions to virtue which existed in the ancient church, was its leading to the acknowledgment of the intimate connexion of religion with daily life, furnishing purer motives of action, and kindling the moral feeling, of which it was itself the offspring, to a warmth which produced the most valuable fruits in all the relations of public and domestic life. The reformers themselves were not the only noble examples of moral dignity and faithfulness: among their adherents, likewise, the power of the gospel and the sense of duty, gave birth to an honesty and a self-control which elevated the character of society, wherever Protestantism triumphed. The minds of men, liberated from the constraint of human authority, and referring every thing to God and the judge in their own bosoms, attained a true conscientiousness. The integrity and noble sentiments of the Protestant princes put to shame the artifices of Roman policy. A heroic courage, which sacrificed every thing earthly to the cause of truth, a firmness in the profession of faith, a cheerful spirit under the severest oppressions, a boldness and confidence in death, examples of which the world beheld with admiration, appeared among high and low. The courts of the Spanish inquisition, which raged against Protestant Christians, in the Netherlands, found it necessary to substitute private executions for public ones, in order to conceal from the eyes of the people the firmness of their victims. The moral tone of the Protestants could not long remain at such a pitch: in proportion as the numbers of the Protestants increased, unworthy members found their way into the church. Moral improvement was sometimes neglected, in consequence of the zeal for orthodox opinions, especially among the Lutherans, who wanted, in general, a well-ordered system of church discipline; and an abuse of Luther's doctrine—that faith is the only ground of salvation—was sometimes made an excuse for a vicious life. But, notwithstanding this, the morality of the adherents of the reformation received from its influence much firmness and constancy. It spread most rapidly among the citizens, who had attained independence by means of the constitution of the towns; and with this class the Protestant clergy had become intimately connected by a common mode of life, by common interests, and by family alliances. The spirit of morality which they called into life, struck its roots deep and lastingly in this numerous and most flourishing class of the people. Institutions were founded in the cities for the instruction of the young and the relief of the poor; laws were made for the promotion of morality; industry was encouraged by the abolition of superfluous festivals; and a public opinion was formed, distinguished for strictness, purity, and power over the minds of men. In these respects, the Reformed or Calvinistic party excelled the Lutherans. Reformed Switzerland and especially Geneva, where Calvin introduced a system of church discipline, and instituted a court of morals, composed of clergy and laymen, presented an example of purity, unique in its kind, which was imitated by the societies of France and Holland, and the Presbyterians of Scotland and England. The salutary and durable effects of the reformation on the virtue of its adherents in general are obvious to every traveller, even in modern times, by a comparison of Catholic countries with Protestant.

The influence of the reformation on *literature* has been very important. An acquaintance with classic antiquity, at the beginning of the sixteenth century, was a luxury enjoyed only by a few distinguished scholars; and it could not be otherwise under the papal dominion, which might allow classical reading, but could by no means tolerate philosophical deductions therefrom, and practical applications of them to the existing state of things, without the risk of its own overthrow. Hence, even in 1515, Leo the tenth prohibited the printing of translations of the ancients into the vernacular tongues, though he patronised classical scholars, and gave them splendid rewards. Pomponatius was suffered to teach, at Bologna, the unreasonableness, in a philosophical point of view, of the most important doctrines of Christianity; and it was left to the contentious monks to dispute the point with him. Aretino was allowed to vent his wit in virulent libels and licentious poems. Leo the tenth and his successors loaded him with wealth and honours, and Rome styled this monster of impiety and vice "the Divine." The sciences were permitted to become the nurses of unbelief and moral corruption, if no doubt of the supremacy of the pope was circulated and no ray of intelligence was let in upon the people. With the learned luxury which prevailed in Italy at the revival of ancient learning, a systematic plan of keeping the people in ignorance went hand in hand. The Holy Scriptures, with the original of which scarcely an individual clergyman in the largest diocese was acquainted, narrowly escaped being added to the Index of Prohibited Books, in which all translations of them were actually inserted, except the Latin version of the church. The divines who argued against Reuchlin had seen no New Testament in Greek; and they looked upon the Hebrew as a cunningly-devised language of sorcerers. The philosophy of the scholastics followed the philosophy of Aristotle; not that of the instructor of Alexander, but a tissue of empty subtleties and rash assumptions, which was called by its disciples, "the wisdom of Aristotle;" but by Luther, "a cold, stinking and dead dog." The study of the ancient languages, the general use of Latin, as a medium of literary intercourse, and the invention of the art of printing, promoted the progress of learning; but the only element in which they could flourish, and the only direction in which they could be of general utility, they received through the reformation. This broke the fetters in which the hierarchy had bound the human mind; wrested from the clergy the abused monopoly of knowledge; established and protected freedom of thought and the liberty of the press; awakened a spirit of investigation and a love of learning, and opened to criticism, in all branches of knowledge, a boundless field. Among the first promoters of it, there were some men, who loved tranquillity, that, like Erasmus, remained ostensibly attached to the ancient church; but their principles, their exertions, the spirit of their works, showed beyond dispute that they really belonged to the Protestant party. The principle of freedom from human authority, pronounced by the reformation, opened the way to all scientific improvement. The Bible being now acknowledged as the only rule of faith, it became the duty of every theologian to understand the Greek and Hebrew text. This naturally led the Protestants to an acquaintance with the language of Homer and Plato, which Reuchlin had first recommended to the Germans, and to the cultivation of Oriental literature, of which none but the Jews and Arabs then knew any thing. A multitude of old Latin and Greek manuscripts, which till then had been not at all, or but partially understood, were brought to light from the dusty libraries of the abolished convents and by the critical diligence, mostly of the Protestant literati, were made capable of being generally used. Science sprung into new existence, with the freshness and strength of youth, when Melanchthon, who had become wiser and better for his studies, and the bold and industrious Calvin, were the teachers of Germany and France. This effect of the reformation appears strikingly from the fact, that before its commencement the south of Germany was superior in literary refinement to the north; and half a century later, when Protestantism had fixed its seat in the north, the reverse was the case; and, from that period, the Protestant countries of Europe have far outstripped the Catholic in intellectual cultivation.

The influence of the reformation on the *arts* was less happy. It removed the images from the churches, and deprived the masses of their dramatic and musical attractions. It repressed the predominance of imagination, and restored to reason its rights. It taught men to prefer the good to the beautiful, and to feel a dignity in despising those means of excitement which operate through the senses, and to abstain from outward splendour. This severity to the arts, which cut off their connexion with religion, and robbed them of that share of public veneration which they had received from Catholicism, met with its punishment in the decline of the fine arts among the Protestants. This was particularly the case with the Calvinistic or Reformed party; for the Lutherans retained many paintings in their churches and always celebrated their festivals with music. On the other hand, Protestantism inspired a love of devotional poetry, and was favourable to eloquence, as it made the sermon the chief part, the very soul, of public worship, and, by the introduction of the vernacular tongues into the liturgy, gave them a dignity which had an important influence on the national literature of the people under its sway. The useful arts were greatly promoted by the reformation. It aroused a spirit of seriousness, accuracy and perseverance; it promoted commerce and public prosperity; and England, the north of Germany, and Switzerland, have shown that, in this respect, no Catholic nation can compare with them.

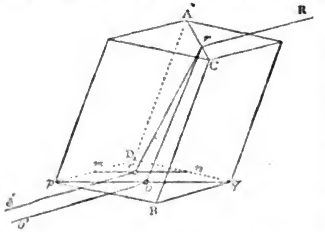
The most visible consequences of the reformation, and those long since most fully acknowledged in history, are those which relate to *politics*. The church was no longer independent of, but became incorporated with, and merged in the state. The reformers had no political object in view; but their work first attained a political importance and direction on account of the zeal of its great enemy, worldly dominion. A large proportion of the abuses of the ancient religious usages—in which all ranks, including even well-disposed clergymen, found a motive to urge the reformation of the church—rested on the political encroachments and avaricious demands of the popes. On them, not the clergy only, but the nations and princes, were made dependent; to them they were obliged to pay enormous tributes, under various pretexts, increased from age to age. Their influence extended to a great part of the administration of public justice in consequence of the ever-augmenting extent of the episcopal jurisdiction, and the power which the papal legates assumed to the injury of the bishops. Hence the princes were perpetually interrupted in the exercise of their authority by the church, which formed, as it were, a state within the state. The kings of France alone were able to maintain a position of honourable independence. The mass of the people was oppressed; in the administration of government, arbitrary rule and personal authority every where prevailed over legal order. In the nobility, there was a spirit of rudeness and violence which led them continually to violate the rights of the other classes. No wonder that, under these circumstances, the magic name of *evangelical freedom* immediately awakened thoughts of civil liberty, and became to the suffering people a signal for insurrection. Still, however, the guilt of having occasioned the peasants' war can as little be charged to the reformers, who expressly discountenanced such excesses, and laboured both by word and deed to check them, as the foolish struggle of the Anabaptists against all civil order. Wherever the reformers, in their advance, impinged on the relations of civil life or of established rights, they went to work with a moderation which gained for them the confidence of governors and princes. The Swiss reformers, indeed, were far bolder than those of Wittenberg; they were favoured with republican governments, and acted with the consent of the towns. The course of the reformation in Protestant Germany, and Switzerland generally, was this. The communities, particularly in the cities, negotiated with their rulers according to their own consciences and the advice of the reformers. The princes concurred in their plans, and established institutions accordingly. In Prussia, Sweden, Denmark, England, and those German states which came over later, the princes made changes of their own accord, and the people found themselves sinking gradually into the new forms imposed upon them. Where the government continued Catholic, the friends of the new doctrines exercised their worship in secrecy and silence. The reformation liberated the princes from all the obligations and grievances which their dependence on a foreign spiritual power had imposed on them. They now obtained for themselves the episcopal privileges which had once limited their authority; and the instruments of power, which had formerly served the church, came, as far as Protestantism permitted their use, into their hands. The return of the clergy to civil society increased the number of their subjects, and various causes augmented their resources and the prosperity of their people beyond computation. These were the acquisition of the church estates, which had come under their power, or, as in the case of the abolished convents, into their possession; the cessation of the vast emissions of money from their estates, which had been occasioned by the avarice of Rome, the efforts of legates, the privileges of foreign archbishops, the begging of mendicant friars, and the connexion of the religious orders with foreign governors: another cause was the new spring given to commerce, trade, and agriculture, and the increase of population, occasioned by the immigration of their exiled brethren in the faith. They were now free to arrange their financial systems, to improve the state of their dominions, to augment their armies, and to provide for the wars with which they were threatened. And, as religion, which, till the peace of Westphalia, was really or ostensibly the chief motive of the civil alliances and wars, was also the subject dearest to the heart of every individual, the animation of the people prompted them to risk their wealth and their blood in the cause of their rulers. Thus the Protestant princes became great, and states of small extent obtained a high political importance, for which they were mostly indebted to the reformation. The church gained much in spirituality by its improvement, as has appeared from the preceding views of morals, literature, and religion. It lost its temporal goods, indeed, to the princes, but received back a large proportion of them, to be applied to worthier purposes. From the patrimony of the ancient church, the funds for public institutions of learning were increased; new and better ones were established; orphan asylums and hospitals were founded; rewards provided for literary men of merit, and the income of the lower clergy increased. With the goods of the church, the persons of the clergy came likewise under the jurisdiction of the temporal princes. The influence of the reformation has not been felt merely by the nations which have adopted its principles; the states which most violently opposed it, have learned by experience the danger of attempting to repress the operation of deep-rooted and wide-spread convictions. If Charles V. had cherished sufficient love for the Germans, and for the cause of evangelical truth, which probably had made some impression on him, to sacrifice to it his Spanish crown, he might have preserved Germany, which, in his time, was almost entirely devoted to the new doctrines, from the bloody religious wars which afterwards desolated it, and have made it an invincible monarchy under the Austrian sceptre. The struggle of Spain against the new doctrines procured her more hatred and ridicule from Europe generally, than honour in Rome, and was followed by the decay of her greatness. France, whose kings, in conformity with their maxim, to use the reformation abroad as a means of exciting dissension among the neighbouring powers, and to suppress its doctrines within their own dominions, were at the same time the friends of the Protestant princes and the bitter persecutors of their own Protestant subjects, expiated the guilt of its double-dealing in the ruinous civil wars and emigrations which it occasioned. Still more pernicious was the opposition to Protestantism in the case of Poland, for the destruction of which Russia made use of the same policy which France had employed with tolerable success in Germany; viz. affording support to the Dissidents (q. v.), and entering deeply into its internal dissensions. The states of Italy, which tolerated nothing that savoured of reformation, sunk deeper and deeper in political insignificance, which was, indeed, owing more to the discovery of a passage by sea to the East Indies, and the intercourse with America, than to the reformation. The popes struggled against this formidable enemy with resolution, and in some cases with success. In the states which continued faithful to the church, they established institutions for resisting the progress of the new doctrines, and for the persecution of heretics. By the happy result of their missions to Asia and America, they gained a spiritual dominion over territories more extensive than the half of Europe, which they had lost by the reformation. But this success was transient, and of little utility to their treasury. No mission could compensate for what they had formerly drawn from Germany, England, and Scandinavia. They were obliged by necessity to curtail their ancient extravagance, and by shame to correct the morals of the clergy. Even the Catholic princes, by degrees, grew more prudent, and diminished the power and the revenue of the papal court in their states, particularly after the peace of Westphalia. (See *Pope.*) The Catholics would no longer yield the same obedience to it as before; for, particularly in Germany (Austria, and Bavaria), in France, and even in Spain, principles and opinions were imperceptibly propagated, which made them partakers in the new light that had spread over Europe. They began to distinguish the true Catholic from the Roman church; and the doctrines of the latter not founded on the Bible were viewed as merely disciplinary, and not to be put on the same footing with divine truth. See Planck's *History of the Protestant Doctrine* (6 vols., 2d ed., Leipsic, 1791); Heeren's *Development of the political Consequences of the Reformation* (Historical Works, part i.); Menzel's *History of the Germans from the Reformation* &c. (part i. Breslau, 1826); Burnet's *History of the Reformation*; the histories of England, by Hume, Lingard, Mackintosh; and also the article *Britain*.

REFORMED CHURCH, in a general sense, comprehends all those churches that have been formed by a separation from the church of Rome; but the term Reformed is often restricted to those Protestant churches which did not embrace the doctrines and discipline of Luther. The title was first assumed by the French Protestants, and afterwards became the common denomination of all the Calvinistical churches on the European continent. It is in this restricted sense that we wish it to be understood in the present article. The same need of a reformation of the church, which excited the zeal of Luther in Germany, in the first half of the sixteenth century, induced many distinguished literary men and clergymen in Switzerland and the Netherlands, in England and France, to labour for the same end. Among the Swiss, Ulrich Zuinglius and John Œcolampadius (*see these articles*) were the most prominent. When the Franciscan Bernard Samson, a kindred spirit with Tetzel, preached the efficacy of indulgences with equal shamelessness, and came to Zurich, where Zuinglius was a religious teacher, the latter violently attacked him, and, the council of Zurich seconding his zeal, Samson was not tolerated in the city. In vain did a papal nuncio labour to put down the reformer, and in vain did the Swiss confederacy warn and threaten him. After many changes in the forms of public worship, on his own responsibility, in 1523, he transmitted sixty-seven propositions in German, in which he set forth his doctrines, to the council of Zurich; the council gave them to the world, and invited the reformer to a disputation, and attended, with many of the citizens, when it took place. A large part of the audience was gained over to his sentiments. The work of reform was now carried on with impetuosity, and much that was in itself innocent, and perhaps even useful, was abolished. The altars, fonts, and images, were banished from the churches; even vocal music and the organ were proscribed. The confederacy, January 26, 1524, at the diet of Lucerne, threatened to exclude Zurich from the council; but she stood firm, and the town of Muhlhausen soon declared in favour of the new doctrines. Capito (Koflin) introduced the reformation into Basle; and, after 1523, Œcolampadius continued his work. In 1524, the first efforts for a reformation were made at Schaffhausen. From 1525, Berne also was more inclined to the same, and even the zealous Catholic cantons began to feel their need of it. At length, a religious disputation took place in 1526. Here Œcolampadius maintained the contest against a large number of vehement Catholics, among whom John Eck was most prominent. Zuinglius did not appear, and the papal majority issued against him a sentence of excommunication; but they could not obstruct his influence. Berne resolved, in 1528, upon another disputation, though against the will of all the other cantons and the emperor himself. But nothing was settled; and the only consequence was, that the people of Berne were more decided in favour of the reformation. It now spread more and more, notwithstanding all the resistance of the Catholic cantons—Schweitz, Uri, Unterwalden, Zug, and Lucerne. A large proportion of the confederates had already become devoted to the Protestant doctrines, when these Catholic cantons, having formed an alliance, for the defence of their opinions, with king Ferdinand (brother of the emperor Charles V.) prepared to appeal to arms. The Catholics renounced all connexion with the Protestants, and in October, 1531, Zurich, abandoned by the rest of its party, was forced to appear on the field alone. October 11, her soldiers were defeated at Cappel. Zuinglius himself, who led his adherents, fell in the battle. But the bloody defeat did not check the progress of his opinions. Zuinglius had made known his doctrine, that the bread and wine, in the Lord's supper, are mere symbols of the body and blood of Christ, in a letter published, much against his will, November 16, 1524, and had first declared them publicly, in 1526, in his Commentary on true and false Religion (*Commentarius de vera et falsa Religione*), and afterwards in many controversies with Luther and others. In fact, his religious views, in general, were characterized by a reference to reason. By his restless spirit of inquiry, his peculiar sagacity, and moving eloquence, he succeeded in raising his own notions to a dogmatical authority in the Swiss churches. Out of Switzerland, too, his system found much favour, and in several countries became the prevailing one. The churches, however, which inclined to his doctrines, were early divided in various ways, and a perfect union was never effected. Zuinglius himself lived too short a time to bring about a complete organization of the Swiss churches. Œcolampadius, who was the pillar of the new church after him, was soon removed by death. But even during his life, Zuinglius never had that decisive authority among his adherents, which Luther possessed among the German Protestants, and which led to a greater unity among them. The other Swiss reformers did not stand in the same relation to Zuinglius as the German reformers did to Luther; they acted more independently, and hence not, at first, in perfect harmony, in the work of the reformation. But there soon arose a man in the Swiss church, who acquired most important authority, and even gained over many Swiss and French Protestants to the opinions in which he differed from Zuinglius. This man was John Calvin, who, flying from France, found an asylum in Geneva, and soon acquired the greatest influence. In his doctrine concerning the Lord's supper, he differed somewhat from Zuinglius. But the doctrines of election and predestination he made the distinguishing characteristics of his system, and his opinions on these subjects excited opposition, and awakened new dissensions in the Reformed churches. Before his death, the ecclesiastical relations of Switzerland were more fully settled, and Glarus, Appenzell, Biel, the Grisons, and Neuberg, became attached to the Reformed party. This party, however, never formed a proper church with a uniform creed. In 1530, Zuinglius had made known his own creed and the creed of his adherents to the diet of Augsburg, where the German Protestants also set forth their profession of faith. But this was not the universal creed of the Reformed party, and did not secure their recognition as a church by the secular authorities. The Swiss, however, to secure the aid of the Protestants in Germany against the Catholics, sought a reconciliation with the Lutherans; but the Wittenberg Concord, so called (see *Sacrament*), failed of its object. Afterwards, in 1549, in the *Consensus Tiguriens*, the controversy between the people of Zurich and the Calvinists of Geneva was composed; but even then, there was no true union of doctrine. At length, in the peace of Westphalia, in 1648, the Swiss were recognised as adherents of the Augsburg confession and as a religious party. But they did not adopt the Augsburg confession unconditionally, or acknowledge it as their symbolical book. At length, after tedious contests, John Henry Heidegger, a divine of Zurich, in 1671, drew up the *Formula Consensus Helvetici*, in twenty-six articles, with particular reference to the existing disputes among the Reformed theologians. This new form of concord, after 1675, was gradually adopted by the Reformed Swiss cantons, but by several of them only nominally, and a perfect concord could never be effected in Switzerland. Out of Switzerland, the Reformed party were decidedly opposed to it, and thus new dissensions were kindled. In the midst of the severest contests, the reformation had spread through the Netherlands, where the majority of the Protestant party adhered to the doctrines of Luther; but the Netherlandish confession of 1551, inclined to the Swiss creed, and it was afterwards greatly altered. Maurice, prince of Orange, whom the Netherlands termed the preserver of their civil liberty, was an advocate of the latter. Soon, however, a violent controversy was kindled here among its adherents, when Jac. Arminius attempted to soften the Calvinistic doctrine of predestination, and Francis Gomarus, his colleague in Leyden (especially after 1604), violently opposed him. Excellent men, such as Hugo Grotius and others, agreed with Arminius; and after his death, Simon Episcopius (bishop) defended his opinions. The contest grew more and more violent; for political motives became interwoven with religious. The Arminians—now called *Remonstrants*, from their *Remonstrantia*, or confession, transmitted in 1610, to the states of Holland—were cruelly persecuted by the Gomarists, or Contra-remonstrants, and the religious conferences at the Hague and Delft led to no reconciliation. At length, in 1618, the celebrated synod of Dort was convened, and, after protracted deliberations, rejected the doctrines of the Remonstrants, in May, 1619, and confirmed the severe, but somewhat mitigated doctrine of predestination. But foreign theologians would not concur unconditionally in the decrees of the synod. the Remonstrants (q. v.) maintained their standing as a distinct party, and published, in 1621, a continct creed, composed by Episcopius. In France, the Reformed party (see *Huguenots*) was exposed to the severest attacks; by the edict of Nantes, in 1598, they first enjoyed toleration. But although they submitted to the doctrines of Calvin, they had no firm bond of union within themselves. The English church, which is reckoned among the Reformed, was instituted in so peculiar a way, was involved so early in controversies among its members, and divided into so many parties, that it hardly deserves the name of a church. The creed of 1551, which consisted originally of forty-two articles, but was reduced to thirty-nine articles, in 1562, by the synod of London, and was neither purely Zuinglian nor Calvinistic, could not unite the contending parties. (See *England, Church of.*) Unsuccessful attempts have often been made to unite the Reformed and Lutheran churches. In the Prussian dominions, and some other German states, however, since 1817, the long projected amalgamation of the Reformed and Lutheran churches into one evangelical Christian church has been partly effected, and attended with important results.

REFRACTION, Double; a department of the science of optics, which owes its origin to the observations of the illustrious Huygens. In looking through a piece of Iceland or calcareous spar (carbonate of lime), he was surprised to find that a double image of the object was refracted by the crystal in certain positions, the rays of one image following the ordinary law of refraction, discovered by Snellius, and explained under *Refraction* in our article Optics, but the rays of the other image following another law.

Iceland spar, or carbonate of lime, is found generally in crystaline rhomboids, the angles of the sides being 105°. It is transparent, susceptible of a fine polish, and has a specific gravity of 2·714. The cleavage of the crystal is easily effected, and the face after cleavage is generally planed and polished.

Having procured one of these crystals, properly cleared and polished, place it over a sharp line in the position represented in the annexed wood cut. The eye being at R, the observer looking down through the crystal will perceive two images of the line, as *m n*, *p q*. In the same manner a spot or luminous point will be doubly refracted by the crystal, and two images will be seen, as at *e o*, conversely; if from the point R, where we have supposed the eye to be, we cause a ray of light to fall upon the crystal in the direction R *r*, it will, on entering the crystal, be separated into two rays, *r e* and *r o*, which two rays will, when they emerge from or leave the rhomboid at *e* and *o*, proceed in the direction *e e'*, *o o'*, parallel to the incident ray R *r*. Let us see what takes place when the incident ray forms different angles with the plane of the crystal, taking care to observe the positions of the two refracted rays, *r e* and *r o*. When the ray R *r* is perpendicular to the face of the crystal, or when the angle of incidence is 0, then the ray *r o* will suffer no refraction, by the ordinary laws of optics, but the other ray *r e*, does not obey this law, for it will be found to be refracted at an angle of 6° 12'. In all other positions of the incident ray R *r*, the refracted ray *r o* follows the common law of proportionality to the sines, but not so with the ray *r e*. The ray *r o*, therefore, is denominated the *ordinary* ray, and the ray *r e* the extraordinary ray.



In all doubly refracting substances there is at least one line or plane along which no double refraction takes place. According to the number of these axes or planes of axes in a body, it is said to be a crystal, or body of one, two, three, four, &c. axes, or planes of axes of double refraction. When the disappearance of double refraction arises from the action of two opposing powers of double refraction, such axis is said to be a resultant or compensation axis; but when the disappearance of double refraction does not arise from this cause, it is said to be a real axis of double refraction. The ray which is extraordinarily refracted, may either take a direction towards or diverge from the axis or plane of axis of the prism or crystal; in the first case the axis is said to be positive, in the latter case it is called a negative axis.

According to Sir David Brewster, all doubly refracting crystals that have the form of the rhomboid, the regular hexahedron, the square-based octahedron, and the square-based right prism, have all one axis of double refraction. Among those which he examined, and of which he has given an extensive list, we select a few of the more prominent, prefixing the sign — to those whose axes are negative, and + to those whose axes are positive.

RHOMBS WITH AN OBTUSE SUMMIT.

— Carbonate of Lime. + Dioptase

— Phosphate of lead. + Quartz.

RHOMBS WITH AN ACUTE SUMMIT.

— Sapphire. — Cinabar.

REGULAR HEXAGONAL PRISM.

— Emerald. + Hydrate of magnesia.

OCTAHEDRON WITH A SQUARE BASE.

+ Zircon. + Prussiate of potash.

RIGHT PRISM WITH A SQUARE BASE.

+ Titanite. — Subphosphate of potash.

We will now attend a little farther to the phenomena exhibited by the first single axis doubly refracting crystal mentioned, *i. e.* Iceland spar. Cut each of the faces of the crystal perpendicular to the axis, and take care that they be polished and plane; it will be found that a ray of light, which passes through the crystal in a direction parallel to its axis, does not suffer double refraction, the ray continuing undivided, and the index of refraction will be found to be 1·6543. Now if the ray is made to pass through the crystal in any other direction than that of parallelism to the axis, the ray will be divided, or in other words, double refraction will take place, and the ordinary and extraordinary rays will have different indices of refraction. It is remarkable, that whatever be the direction of the incident ray, the index of refraction of the *ordinary* ray remains the same, being invariably 1·6543. When the incident ray falls upon the crystal perpendicularly to any one of its faces, (these faces being each at an angle of 44° 36' 34" to the axis) then must the plane of incidence pass through the axis, and the index of refraction of the ordinary ray still remaining the same as before stated, the index of the extraordinary ray will be found to be 1·572. Let the prism be now ground, so that one of its faces shall be parallel to the axis, and let the incident ray fall upon any part of the prism perpendicular to the axis, then, although the index of the ordinary ray be still the same, that of the extraordinary ray will be found to be 1·4833, Hence it appears that the deviation of the extraordinary ray is 0, when the light passes parallel to the axis, but increases gradually, until the incident light be perpendicular to that axis, where that deviation is a maximum.

Huygens, by very careful observations on the positions of the ordinary and extraordinary rays at different incidences, arrived at the general law, that the reciprocal of the index of refraction of the extraordinary ray was measured by the radius of an eclipse, whose lesser axis is to its greater as the reciprocals of the greatest and least indices of extraordinary refraction.

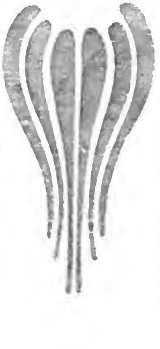
Among the crystals with one axis, that being a positive axis, quartz or rock crystal may be selected as an instance. The index of refraction for the ordinary ray in this crystal is 1·5484, and this is also the index of the extraordinary ray when the light passes along the axis; but if the incident rays changes its direction with respect to the axis, it will be found that the index of the extraordinary ray continually increases, until the ray be at right angles, where it is a maximum, being 1·5582.

Among the crystals which have two axes of double refraction, may be mentioned *glauberite* and sulphate of iron. M. Fresnel discovered the important law, that in crystals of this class, both the rays follow the law of extraordinary refraction. There is another interesting family of crystals, i. e., those which have one axis for the most refrangeable rays, and another axis for those rays which are least refrangeable. An example of this occurs in glauberite, which has two resultant axes, inclined to one another at an angle of 5°. The power of double refraction may be given artificially, either by compression, or the rapid transmission of heat.

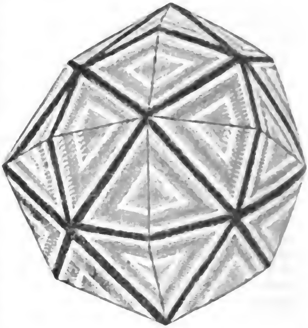
Under our article Polarization of Light, we presented to the reader's notice some curious phenomena connected with the doctrine of colours. See page 605, volume 5th.

Biot thought that the colours obtained by passing polarized light through a doubly refracting crystal, were the same as those in Newton's scale; but Sir D. Brewster showed this not to be the case.

In crystals where the displacement of the coloured rings is very considerable, the two oval central spots are drawn out into long spectra or feather like tails of red, green, and violet, exhibiting the appearance represented by the annexed wood engraving. A curious phenomena will be observed in these spectra, if we examine them through coloured media, fitted to absorb the several tints; they will be found to consist of well defined spots of the elementary colours, arranged on each side of the principal section of the spectra, beginning at the bottom with violet, and ending at the top with red. The experiments on this branch of the science of light by Sir J. Herschel are completely confirmatory of Sir David Brewster's theory, that all the tints are related to two rectangular axes, and that the apparent axes passing through the systems of rings, are merely axes of compensation. When Rochelle salt is the crystal employed, the length of the spectra shown in the figure above, is not less than ten degrees.

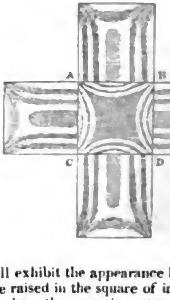


A new species of double refraction has been discovered in experimenting with the icosatetrahedronal crystal Analcime, or Cubizite, represented in the figure below, with its planes of double refraction, and polarization, and the tints of the intermediate solids.



The tints polarized by the crystal are those of Newton's scale, and are negative in relation to each of the four axes, and there is a distinct separation of the ordinary and extraordinary rays when the light from any minute luminous object passes through any pair of the [illegible] planes adjacent to any one axis of the crystal. In all other doubly refracting crystals, the refracting axis has no fixed position in the crystal; in this the axes are fixed.

As before observed, the doubly refracting property may be given by the transmission of heat through glass, and many curious phenomena may thus be obtained. Our limits will not permit us to enter into minute details on this subject; but we may give one example. Let there be two glass plates made doubly refracting by heat, made to pass from the surface to the centre of its structure, and let the plates be crossed, as shown in the figure, they will exhibit the appearance here shown.



The tints are raised in the square of intersection, A, B, C, D, when the negative structure crosses the positive, but depressed when the crossing structures are of the same kind. The curves of the tints are hyperbolar. For an account of an ingenious application of this branch of science to the measurement of heat, see *Thermometer*.

REFRACTOR, or REFRACTING TELESCOPE. See *Telescope*.

REFUGE, CITIES OF, among the Hebrews; six cities belonging to the Levites, in which a person, who had committed involuntary murder, might take refuge from the vengeance of his pursuers, until his case was investigated. (*Deut.* xxxv, 6.) If the murder was proved to have been intentional, the culprit was given up to the avenger of blood; if otherwise, the latter could not injure him within the precincts of the city. See *Asylum*.

REFUGEES. This name is given particularly to the French Protestants, who fled from their native country on account of the persecutions to which they were exposed after the repeal, in 1685, of the edict of Nantes, under which the reformed doctrines had enjoyed toleration from the year 1598. (See *Huguenots*, *Maintenon*, and *Louis XIV*.) The cruelties which inquisitorial zeal had produced in other countries, were renewed in France, against the *heretics*, as they were called. Dragoons were quartered on them, and were to compel them, by oppressions of every description, to renounce their faith; and those who could not be made to recant, either died under the sabre, or were obliged to pass their lives in prison, or in banishment beyond the sea. To escape this state of misery, many fled from their native land. But the government did all which they could to deprive them of this means of escape. The frontiers of France were occupied by troops, and every Protestant, who fell into their hands, was abused, deprived of his property, loaded with chains, and confined in the galleys with the most abandoned criminals; children were taken from their parents, and educated, in monasteries, in the Catholic faith. Nevertheless, 800,000 Protestants, at least, were able by artifice, and in some cases by force, to escape from their native country. England, Denmark, Holland, Switzerland, Germany, in the latter especially Saxony, Bradenburg, and Hesse, received these fugitives with hospitality. Merchants and manufacturers went to England and Holland, whither they could more easily convey their property, and at the same time employ it more profitably. The nobility, soldiers, artists, literati, mechanics, and manufacturers, went to the states of Brandenburg. In many of these countries, the governments gave to the emigrants equal privileges with their other subjects, and received large additions to their resources from the wealth and skill which a fanatical king had driven from his own kingdom. In the Brandenburg states, where these refugees obtained the most extensive civil privileges, they became the founders of a large part of the manufactures, which at the present time constitute so considerable a part of the wealth of the Prussian monarchy. They exerted a still more important influence on the intellectual and moral culture of the countries to which they fled. Concerning the reception of the fugitive French Protestants, in the electoral states of Brandenburg, see the *Denkwürdigkeiten* of Christian William von Dohm (5th vol., 475.)

REGALIA (*jura regalia*); in general, the privileges connected with the sovereign power. They are either such as necessarily originate from the nature of government, or such as are accidentally attached to the sovereign. Of the former sort is the power of judicature; of the latter, such rights as that of collecting amber, which belongs to the king of Prussia. Some rights are now so intimately connected with the public order, that they belong to the former class, though many states have existed without them (e. g. the privilege of coining money, which was exercised by certain families in ancient Rome.) As states and governments have gradually grown up from rudeness and lawlessness, it may easily be imagined how much ignorance, in some cases, and force in others, have influenced the idea of regalia. Among some German tribes, the precious metals and stones were considered as belonging exclusively to the sovereign; and even now a citizen has not, in all countries, the right to work mines on his own ground. Some tribes allowed their princes the sole privilege of hunting all the larger animals, except animals of prey; some sovereigns declared all unclaimed property, as waifs, estrays, or newly formed land on the seashore, &c., *regalia*. These regalia are also called *majora* (comprehending what relates to the sovereign's power and dignity) and *minora* (what relates to his *fiscal* or pecuniary prerogatives.)

Regalia also denotes, in England, the regal *insignia*, the sceptre with the cross, sceptre with the dove, St Edward's staff, four several swords, the globe, the orb with the cross, and other articles used at the coronation.

Regalia of the church denotes, in England, those rights and privileges which cathedrals, &c., enjoy by the concessions of kings.

Regalia is sometimes also used for the patrimony of a church.

REGARDANT, in heraldry, is applied to a lion or other beast of prey, in the attitude of looking with his eyes towards his tail.

REGATTA, a public diversion in Venice, in which boats run races on the canals that intersect the city. Each boat contains one person only, and the boat which first reaches the goal, receives a small prize in money. The number of spectators present, in ornamented gondolas, make the principal attraction of this festival.

REGENSBURG. See *Ratisbon*.

REGENT. *Regent*, in a general sense, is a ruler, the ruler of a state; in a more limited sense, one who exercises the highest power vicariously during the absence or incapacity of the lawful sovereign. The right to the regency is created by law, agreement, or by last will and testament. By a testamentary appointment, a ruler can legally establish a regency only when the right of a third person to the regency, founded upon law, is not injured. The same is true in respect to regencies made by agreement. Among the regencies of modern times, that of Philip, duke of Orleans, during the minority of Louis XV. of France (from 1715 to 23), was deplorable in its consequences for France, and, indeed, all Europe. Our times have seen the regency of George, prince of Wales (George IV), and the short regencies of the former empress of France, Maria Louisa, and that of the queen of Etruria of the same name; the regency of the crown-prince Frederic of Denmark (1784—1808), when he ascended the Danish throne under the name of Frederic VI. It is worthy of remark, that, within the last fifty years, three regencies of crown princes have taken place in Europe on account of the mental imbecility or insanity of the kings of Great Britain, Portugal and Denmark. Of late, when Belgium separated herself from the kingdom of the Netherlands, and Poland rose against Russia, persons were placed at the head of affairs with the title of *regent*, indicating that the revolted countries did not declare themselves against monarchy.

REGGIO. See *Modena*.

REGGIO, DUKE OF. See *Oudinot*.

REGIMENT; a body of troops, either infantry or cavalry, consisting in the former case of one or more battalions, in the latter, of several squadrons. The average number of a regiment of infantry, in the various services, may be stated at about 1800. A colonel or lieutenant-colonel generally commands a regiment. Artillery is also sometimes divided into regiments in time of peace (e. g. in France and Prussia.) Regiments were first formed in France in 1558, and in England in 1660. By the act of congress of March 2, 1821, the military peace establishment of the United States of America is composed of four regiments of artillery, consisting each of nine companies, and seven regiments of infantry, consisting each of ten companies; each company consisting of forty-two privates.

REGIOMONTANUS, whose real name was John Muller, and who, according to the custom of his time, assumed that of Regiomontanus, in allusion to the place of his birth, Konigsberg (King's mountain), in Franconia, was born in 1436. He exhibited great precocity of talent, and, having received a classical education at Leipsic, placed himself under Purbachius (Peurbach), the professor of mathematics at Vienna. Under so able an instructer, he made the greatest proficiency, and became one of the first astronomers as well as mechanics of that age. Regiomontanus, together with Purbachius, accompanied cardinal Bessarion to Rome in 1461, where Beza gave him further instructions in Greek literature, which enabled him to complete a new abridgment in Latin of the Almagest of Ptolemy (Venice, 1496), and to correct many errors in the former translation, made by George of Trebizond. In 1471. he built an observatory at Nuremberg, and established a press; but, after a stay of little more than three years, returned to Rome, on the invitation of Sixtus IV., who employed him in the reformation of the calender, and rewarded his services by raising him to the bishopric of Ratisbon. He died in 1476, according to some, of the plague, according to others, by poison administered by the son of George of Trebizond, out of revenge for his having exposed the errors of his father. Regiomontanus was the first in Germany to apply himself to the cultivation of the neglected science of algebra. He made great improvements in trigonometry, into which he introduced the use of tangents. His refutation of a supposed discovery of the quadrature of the circle, and his numerous writings on various subjects of natural philosophy, display extensive learning and great acuteness. His astronomical observations from 1475 to 1506 (under the title *Ephemerides*) are very accurate. Of his works, the most valuable are his *Calendarium; De Reformatione Calendarii; Tabula magna primi Mobilis; De Cometæ Magnitudine Longitudineque; De Triangulis*. His life has been written by Gassendi (*Opera*, vol. v.)

REGIUS PROFESSORS. Henry VIII. founded five lectures in Oxford and Cambridge, viz. divinity, Hebrew, Greek, law and physic, the readers of which lectures are in the universities' statutes called *regii professores*. Professors in other universities who receive their appointments from the crown are called regius professors.

REGNARD, JOHN FRANCIS; a comic poet, born at Paris, Feb. 8, 1655. Having received a good education, and being set free from restraint by the death of his father, he went to Italy in 1676 or 1677. He was fond of play, and, being very fortunate, was returning home with a considerable addition of property, when he was captured by an Algerine corsair, and, being sold for a slave, was carried to Constantinople. His skill in the art of cookery rendered him a favourite with his master; but at length he was ransomed, and returned home. He did not, however, remain there long; for in April, 1681, he set off, in company with others, on a journey to Lapland, and after going as far north as Torneo, he returned through Sweden, Poland and Germany. Regnard then retired to an estate near Dourdan, eleven leagues from Paris, where he died in September, 1709. He wrote an account of his northern tour, a number of dramatic pieces (the best of which are the *Joueur*, *Légataire Universel*, *Distrait*, and *Retour Imprévu*), poems, and other works, which have been often published, in six vols., 8vo, and four vols., 12mo.

REGINER, MATHURIN, a French satirist, was born at Chartres in 1573, and died at Rouen in 1613. His poetical talents gained him powerful friends, and the cardinal Françoise de Joyeuse took him to Rome, whither he also afterwards accompanied the French ambassador Philippe de Béthune. Some valuable benefices, which were conferred upon him, enabled him to lead a life of ease and pleasure, His works consist of satires, epistles, elegies, odes, epigrams, &c.; but his satires, sixteen in number, are the principal basis of his reputation. Persius and Juvenal are his models, which he surpasses in the licentiousness of his pictures. His colouring is vigorous, but his style is incorrect, and his jests are often low and indecent; yet he is not destitute of true poetical turns, delicate wit, and a pleasing humour.

REGNIER DESMARAIS, FRANCOIS SERAPHIN, born in Paris in 1632, died in 1713. While yet at college, he translated the *Batrachomyomachia*, and after travelling in the train of several men of distinction, he became secretary of legation to the duke de Créqui, French ambassador at Rome. Such was his knowledge of Italian, that an ode written by him in that language was believed to be by Petrarch, and the academy *della Crusca* chose him a member of their body. He was equally well acquainted with the Spanish. In 1670, he was admitted into the French academy, of which, in 1684, he became perpetual secretary. His labours in the compilation of the *Dictionnaire de l'Académie* were of the greatest value, and he was the author of the grammar which appeared under the name of the academy in 1676. In his eightieth year, he collected his poems under the title of *Poésies Francaises, Latines, Italiennes, et Espagnoles*. His historical works are of less value.

REGULAR denotes any thing that is agreeable to the rules of art; thus we say a *regular* building, verb, &c. A regular figure, in geometry, is one whose sides, and consequently angles, are equal. All regular figures may be inscribed in a circle.

REGULATOR OF A WATCH; the small spring belonging to the balance, serving to adjust its motions, and make it go faster or slower.

REGULUS, MARCUS ATTILIUS, a Roman general, celebrated for his patriotism and devotion in the service of his country, was made consul a second time about 256 B. C., and with his colleague, Manlius Vulso, commanded in the first war against Carthage. Notwithstanding the little experience which the Romans then had in naval warfare, the consuls defeated a superior Carthaginian fleet, and effected a landing in Africa. Here Regulus followed up his victories so successfully, that in a short time he presented himself before the capital of the enemy. Carthage, deprived of its fleet, and not accustomed to military operations by land, sued for peace. Regulus, more of a soldier than a politician, persisted, with the Roman haughtiness, in his demand of unconditional submission. The Carthaginians preferred to die rather than to accept such terms, and at this juncture were joined by a small body of Spartan volunteers under Xanthippus. The Grecian general gave battle to Regulus near the walls of Carthage, where thirty thousand Romans fell, and Regulus was made prisoner. Carthage could now hope to obtain a peace upon better terms. An embassy was, therefore, sent to Rome, accompanied by Regulus, who was obliged to bind himself by an oath to return to Carthage, if Rome should refuse the terms proposed. Regulus, however, considered it his duty, in opposition to the wishes of the Carthaginians, to advise the continuance of the war; and neither the prayers and tears of his wife and children, nor the entreaties of the senate and people, who were ready to save the liberty and life of such a citizen by any sacrifice, could bend him from his purpose. The prosecution of the war was, therefore, decided upon, and the Carthaginian ambassadors returned home astonished and irritated, and with them Regulus, in obedience to his oath. The cruel revenge which the Carthaginians are said to have taken on Regulus, is doubted by many modern enquirers, and the silence of Polybius and Diodorus Siculus upon this subject, is certainly remarkable; however this may be, his firmness in refusing to purchase his life by the sacrifice of the public good, is worthy of admiration.

REGULUS, in chemistry, denotes a metal in its most extensive sense—a metal in its proper metallic state. The term is now little used. The old chemists chiefly employed it as a distinctive appellation, when a metal and one of its ores happened to be called by the same name.

REICHARDT, John Frederic; a musical composer, and author, who was a corresponding member of the French institute. He was born at Konigsberg, in 1751; studied in the university of Konigsberg, under Kant; travelled much; was appointed, in 1775, master of the chapel for the Italian opera in Berlin; did a great deal for music under the reign of Frederic William II.; was appointed, in 1807, by the king of Westphalia, director of the French and German theatre; and died in 1814. His compositions are very numerous; among which are the Tamerlane of Morel, and the Panthea of Berquin. Some of his lighter productions are very fine. His literary productions are, Familiar Letters, written during a Journey in France in 1792 (2 vols. 8vo.); New Familiar Letters during a Journey in France in 1803 and 1804 (3 vols., 8vo.); Familiar Letters on Vienna, &c.; Napoleon Bonaparte and the French People under his Consulate, &c. In 1804 and 1805, he was conductor of the Musical Gazette of Berlin. Reichardt was not a great musical genius, but had formed himself by study and an excellent taste.

REICHENBACH, George of, a distinguished mechanical artist, was born, August 24, 1772, at Manheim, and died at Munich, May 21, 1826. In the establishments for the manufacture of optical instruments, which he founded at Munich and Benedictbeurn, in 1805, in conjunction with Utschneider and Fraunhofer, all the instruments necessary for astronomical and geodetical operations were made in great perfection. The great meridian circles of three feet diameter, the twelve inch repeating circles, theodolites, &c., which proceeded from these manufactories, are unsurpassed in simplicity and convenience of construction, in the fineness and delicacy of their divisions, and in their whole arrangement. The telescopes from the optical manufactory of Fraunhofer at Benedictbeurn, are distinguished for the excellence of their flint glass, and, in fact, their whole construction. (See *Telescopes*.) The great equatorial instrument of Reichenbach and the heliometers of Fraunhofer have satisfied the highest expectations of astronomers. Reichenbach constructed a peculiar instrument for baron Zach, in 1812, which may be called a portable observatory, as it unites in itself the two principal instruments of an observatory, a perfect meridian telescope joined to a repeating circle, together with a repeating theodolite for the measurement of azimuths. He likewise distinguished himself by his ingenious constructions at the Bavarian saltworks (see *Berchtesgaden*, and *Reichenhall*), and by his invention of iron bridges, according to a new method, to which he devoted a particular treatise.

REICHENBACH, Congress and Convention of. See *Congress*.

REICHENBERG, the largest provincial town of Bohemia, in the circle of Buntzlau, at the foot of the Jeschkenberg, on the river Neisse, has 14,000 inhabitants and much manufacturing industry. The environs afford precious stones. There are about 900 master weavers of woollen cloth, producing annually 100,000 pieces (of thirty-six ells each); numerous dyers, spinners, &c. There are also 400 master linen-weavers, and 300 master workmen engaged in making stockings. About thirty-eight populous villages around Reichenberg are supported by it. The Bohemians are naturally great musicians, and the traveller is surprised by excellent musical choirs in many of the manufactories in this place.

REICHENHALL, a town in the Bavarian circle of the Isar, with 2400 inhabitants on the Sala, is, in some measure, the central point of the four gigantic Bavarian salt-works. The most ancient documents respecting the salt-works of Reichenhall reach back to the eighth century; but the wood in the immediate vicinity having been so far exhausted, that the brine could no longer be boiled on the spot, a brine-conductor was constructed as early as 1618, by a Mr Reifenstuhl, to Traunstein, a distance of several leagues, by which it is carried over a perpendicular height of 828 feet. A similar conductor of brine was executed in 1809, in twenty months by Von Reichenbach, to Rosenheim, on the Inn, a much greater distance, in spite of numberless obstacles. Mr Reichenbach effected, in 1817, a connexion of the salt-works at Reichenhall, Traunstein, and Rosenheim, with the salt-works at Berchtesgaden. Though the Ferdinandsberg, near Berchtesgaden, is situated 160 feet higher than Reichenhall, yet, on account of the intervening mountains, the brine is raised by two machines 1579 Rhenish feet, and descends again 1740 feet to Reichenhall. For this, a structure of pipes, partly covered, partly open, 102,000 Rhenish feet in length, part of wood, part of iron, was necessary. One of the machines, constructed according to a new principle by Reichenbach, raises the saturated brine 1218 Rhenish feet perpendicularly.

REICHSTADT, a lordship in Bohemia. The chief town of the same name contains a beautiful castle and 1900 inhabitants; about fifty miles north-east of Prague.

REICHSTADT, Duke of. See *Bonaparte*, Napoleon Francis Joseph Charles.

REID, Thomas, an eminent metaphysician, was born in 1710, at Strachen, in Kincardineshire, where his father was minister, and educated at Marischal college, Aberdeen. In 1737, he was presented by King's college, Aberdeen, with the living of New Machar, in the same county, where the greater part of his time was spent in the most intense study. In 1752, he was elected professor of moral philosophy at King's college, Aberdeen, and, in 1763, accepted the same office at Glasgow. In 1764, he published his celebrated Inquiry into the Human Mind on the Principle of Common Sense, which was succeeded, in 1786, by his Essays on the Intellectual Powers of Man, and, in 1788, by his Essay on the Active Powers. These, with an Analysis of Aristotle's Logic and an Essay on Quantity, form the whole of his publications. He died in October, 1796, in his eighty-sixth year, with a high character for benevolence and integrity, as well as for talents.—See the article *Philosophy, Mental,* and his life by Dugald Stewart. A French translation of his works by Jouffroy, with an Introductory Essay, and the Notes of Royard Collard, has recently appeared at Paris (1828 seq.).

REIL, John Christian, professor in the university of Berlin, was born Feb. 20, 1758, in East Friesland. In 1783, he was graduated at Halle. After having practised medicine for some time, he was appointed professor of therapeutics, in 1787, in Halle. He taught and practised there for twenty years, until the conquest of Germany by the French ruined this ancient university. In 1810, he was appointed professor in the newly created university of Berlin. In 1813, he was appointed one of the highest medical officers in the military department; but before the time for his entry on his new avocation, the typhus fever carried him off, Nov. 22, 1814. Reil had many excellent qualities. He was particularly distinguished for his skill in mental maladies, and has acquired a lasting reputation by his investigations into the structure of the brain, and his new physiological views. His work On the Symptoms and Cure of Fever will long survive him.

REINDEER. See *Deer*.

REINECKE. See *Renard*.

REINHARD, Francis Volkmar, a celebrated Protestant preacher, born in 1753, was a native of the duchy of Sulzbach, in Germany. He was instructed by his father (who was a clergyman) till he was sixteen, when he was admitted into the gymnasium of Ratisbon, where he remained five years; and, in 1773, he was removed to the university of Wittenberg. The study of sacred eloquence especially attracted his attention; and his reputation procured him, in 1782, the chair of theology, to which, in 1784, was added the offices of preacher at the university church and assessor of the consistory. In 1792, he was invited to Dresden to become first preacher to the court of Saxony, ecclesiastical counsellor, and member of the supreme consistory. After filling these stations with high reputation for about twenty years, he died, Sept. 6, 1812. His principal works are, A System of Christian Morality; an Essay on the Plan formed by the Founder of Christianity for the Happiness of the Human Race; Sermons; Letters of F. V. Reinhard on his Sermons, and on his Education as a Preacher; Lectures on Dogmatic Theology.

REINHOLD, Charles Leonard, born in Vienna, Oct. 26, 1758, was professor of philosophy, first in Jena, (from 1787), then at Kiel (from 1794), where he died, April 10, 1823. His Catholic parents destined him for the church, and sent him to study with the Jesuits in Vienna. When the order was abolished in 1774, he entered the college of the regulated priests of St Paul (generally called *Barnabites*), where he became, at the age of twenty-two years, professor of philosophy. During the reign of Joseph II., he distinguished himself by many philosophical treatises in periodical works. But his vigorous and inquiring mind could not fail to discover the weakness of many Catholic dogmas. He left Austria in 1787, and the same year was appointed professor at Jena, having written a celebrated Vindication of the Reformation against two chapters in Schmidt's History of the Germans. Jena owed to him much of its reputation. We cannot enumerate his many works; but they are as remarkable as the productions of a mind which freed itself by its own efforts from the prejudices of education. In his philosophy, he followed Kant, Fichte, Bardili and Jacobi. Professor Ernest Reinhold, his son, published, in 1825, in Jena, his life, with a number of letters addressed to him by Kant, Fichte, and many celebrated philosophers.

REINSURANCE, in commerce, a contract by which the first insurer relieves himself from the risks he had undertaken, and devolves them upon other underwriters, called *reinsurers*.

REIS EFFENDI. See *Effendi*.

REISKE, John James, a distinguished German philologist, was born at Zorbig, in Saxony, in 1716. He was the son of a tanner, who was able to do but little for his education. After studying, from 1728 to 1732, in the orphans' school at Halle, he went, in 1733, to the university of Leipsic. Rendered gloomy and melancholy by his monastic education at Halle, he did not attend any lectures at Leipsic, but studied by himself, without method. He had studied the Arabic language, devoting to that object all the resources at his command; and, in 1738, though entirely destitute, undertook a journey to Leyden, then the seat of Arabic literature. In Hamburg, he found two patrons (Wolf, a clergyman, and professor Reimarus), who enabled him to accomplish his wishes. In Leyden, Schultens gave him access to the library, of which he made diligent use. D'Orville and Burmann, who employed him in making translations and correcting the press, became his patrons. Reiske pursued his philological studies with the greatest zeal, and, at the same time, attended to theoretical medicine, and received the degree of doctor, free of expense, from the medical faculty. He had gained much reputation in Leyden for learning and industry; but he refused offers which were made him, in the hope (which was never, however, fulfilled) of better. He might have succeeded in Holland, if he had not made enemies by his self-will and love of independence. He returned to Leipsic in 1746, but was there also unable to procure any place, except that, in 1748, by the favour of the elector, he received the title of professor of Arabic, and was obliged to gain his subsistence by private instruction, writing of books, correcting the press, translating, and by contributions to critical journals. Meanwhile, he was always pressed for want of money, as he spent almost all which he acquired in purchasing books, especially in Greek and Arabic literature, and turned his works to little account. In 1756, by the explanation of an Arabic inscription, he attracted the notice of the count of Wackerbarth, who procured him, in 1758, the rectorship in St Nicholas's school at Leipsic; the duties of which he discharged with fidelity for sixteen years, notwithstanding his numerous literary labours. In 1764, he married Ernestine Christina Muller, a lady of uncommon talents and learning, who assisted him in his labours, and was his faithful companion till his death in 1774. Greek literature is indebted to Reiske for excellent editions of Theocritus (Vienna and Leipsic, 1765, 2 vols., 4to.), of the Greek orators (Leipsic, 1770—75, 12 vols.), of Plutarch (Leipsic, 1774—79, 12 vols.), of Dionysius of Halicarnassus (Leipsic, 1774—77, 6 vols.), and of Maximus Tyrius (Leipsic, 1774, 2 vols). Uncommon erudition and critical acuteness are displayed in his *Animadversiones in Græcos Auctores* (Leipsic, 1757—66, 6 vols.), containing emendations of a great number of passages of the Greek classics. His collection of manuscripts, chiefly Arabic, which he had himself transcribed or purchased, was bought, after his death, by Suhm of Copenhagen. His life, written by himself, with impartiality and frankness, was continued to his death by his wife, and published, at Leipsic, in 1783. The excellent *Vita Reiskii* by Morus (Leipsic, 1777) should be compared with it.

REKA; Russian for *river*, as *Tchernaiareka* (Black river).

RELATION (Italian *relazione*) was the name given to the full and minute account which a Venetian ambassador was obliged to render, on his return, to the council of the Pregadi, respecting the state of the country to which he had been sent, its foreign and domestic relations, the character of the prince, chief officers and people. These, together with the reports which the ambassadors were obliged to make every week, were preserved in the archives. As early as 1268, the senate passed a law obliging the ambassadors to write down every thing remarkable which fell under their observation. In 1465, the word *relazione* came into use. The last of these *relazioni* mention the beginning of the French revolution. They were often copied by order of patrons of science, so that many are found in the libraries at Rome, Paris, Berlin; some are in Gotha, and several in smaller libraries of Italy. In the beginning of 1831, a number of them were sold among the manuscripts of the late lord Guildford. The circumstance that Venice stood, in early times, in very important relations to all the principal powers of Europe, particularly to Spain and the sultan, when the Porte was at the apex of its power, renders the *relazioni* one of the most important and most interesting sources of modern history.

RELEGATIO (exile); a punishment in use among the Romans, particularly under the emperors. The name has been retained in the government of German universities. See *Consilium Abeundi*.

RELICS; the remains or supposed remains of holy persons, saints or martyrs, or some objects belonging to them, or in some way connected with them. These relics were multiplied particularly after the crusades. Thus in some places are shown the shroud in which the body of Christ was laid, pieces of the cross, of objects surrounding the sepulchre, and relics of Mary, Joseph, and the holy men of the early Christian church. At first, these objects were only held in high esteem; but eventually superstition ascribed to such relics miraculous powers, and a system of fraud was countenanced by the Roman clergy for their profit: honours, little short of divine, were paid to these objects, and more virtue was attributed to a splinter of the cross than to the word of the Saviour.

RELIEF. See *Relievo*.

RELIEF, in law; a certain sum of money, which the tenant, holding by military service, and being at full age at the death of his ancestor, paid to the feudal lord at his entrance on the possession of the estate.

RELIEVO (*Italian*), or **RELIEF**; sculptured work, raised above a surface with which it is connected. It has several gradations (*basso*, *mezzo*, and *alto-relievo*). Originally, with the Greeks, it was very flat, as in the instance of the lion on the gate of Mycenæ, perhaps the most ancient preserved relief. Phidias brought it to perfection; and the cornices and metopes of the Parthenon, and the temple of Apollo at Bassæ, near Phigalia, in Arcadia, preserved by a fortunate accident, are yet unrivalled models of *relievo*. In the sculpture of the later Romans, who strove to supply by technical execution what was wanting in spirit, the high relief (*altissimo relievo*) was adopted, in which the figures were so raised as to stand almost entirely out from the ground, which was covered with other figures, in low relief. Probably works in precious stones of several layers, cameos in *pietre dure*, occasioned these attempts, of which the collection of antiques at Dresden contains remarkable specimens. It was the intention of Algardi and his followers to carry relief still farther. They even attempted perspective representations, including landscapes. A misconception of the true limits of sculpture and glyptics, in relation to painting, was the cause of these aberrations from a just taste, which have maintained themselves in medals. Thorwaldsen has restored to the relief its true and simple character, whilst Canova's *relievi* strive too much to imitate painting. Another kind of relief has been employed of late, which, however, is not to be commended. On medals, particularly, the figures have been represented on an elevated surface, as if cut in an onyx of two layers. For all these kinds of work, the Greeks had the general name ἀναγλυφα; also γραπτα ἀναγλυφα, because they were frequently painted. As yet, no Greek *reliefs en creux* have been found, such as were used in Egypt—slightly raised sculpture, in a depressed surface, often filled with colours. In hard stones, these can be worked only with the best steel.

RELIGION. This word, defined in so many ways, is derived from the Latin *religio* (a sacred oath, or obligation), but that which it signifies, is as old as man and his relation to God, whom it presupposes. Man is not only placed in a certain relation towards the Deity, but is naturally led to the idea of his existence, the comprehension, in some degree, of his nature, and the study of his own relations towards him. This disposition and capacity, rude as its early manifestations may be, makes man a religious being. Religion, therefore, in its widest sense, may be defined to be the sentiment and knowledge of our relation to God, and of the great variety of consequences flowing therefrom. *Religion* is also used in English for *piety*, or the disposition to do what the individual believes to be the will of God. The religious disposition, and the degree of religious knowledge, show themselves in various ways; and the communication of this knowledge, as it relates to supernatural subjects, must be often effected in a symbolical way; and the forms in which the religious feeling expresses itself (forms of worship), must be of a symbolical character. The variety in the modes in which the religious feeling manifests itself in different nations, gives rise to the idea of positive religion. A positive religion is religion modified by the peculiar development of the religious disposition, by peculiar views respecting the relation of man to God, and of his destiny, as well as by peculiar customs and symbols of worship. In this sense we speak of a Mohammedan, pagan, Christian, Jewish religion. A particular form of religion becomes predominant by a variety of causes; by the growing authority of tradition, or the intellectual superiority of particular men, who imbue families, tribes, nations, with their own religious notions, by the blending of politics and religion, and not unfrequently by persecution itself. The adherents of most religions, moreover, refer the establishment of their own particular form of faith to the direct interference of the Deity whom they worship. It is the province of the philosophy of religion to investigate the original principle of all religions, and the most hidden causes of the variety in the development of this great, eternal, original principle. The history of religion shows the historical development of this principle, and those general notions which lie at the basis of each religion. (See Benjamin Constant's work on religion.) The different views entertained of revelation lead, of course, to different views of religion. Those who are convinced that man could not have obtained a sufficient knowledge of his relation to God by the faculties within him, but that a direct interposition of the Deity was necessary, oppose revelation to natural religion, by which is understood that knowledge of our relations to God which we may obtain by our own faculties, unaided by the special interference of the Deity. Some theologians, however, particularly in Germany, do not confine revelation to a direct interference of the Deity on a particular occasion, but give this name to all communion, of the highest kind, of man with God; so that they, in fact, blend natural and revealed religion, and do not admit any thing as revelation which does not satisfy their reason. These are called *naturalists*, or *rationalists*. Their opponents are called *supernaturalists*. (q. v.) The rationalists must not be confounded with deists.

RELIGION, ESTABLISHED, or RELIGION OF THE STATE, is that form of religion to which certain privileges are attached; for instance, certain political rights to its professors, or certain distinctions to its priests or ministers. The revolution of July, 1830, changed the clause in the French charter, which declared the Catholic religion the religion of the state, to a declaration that it was the religion of the majority. See *Religious Liberty, Non-Conformists, and England, Church of.*

RELIGIOUS, as a substantive, is used for the members of religious orders, monks and nuns. See *Orders*.

RELIGIOUS LIBERTY, or LIBERTY OF CONSCIENCE, is the freedom of a man to worship his God as he pleases, if he does not thereby disturb the peace of the commonwealth. It exists in perfection where the adherents of every religion can worship publicly, conduct schools and seminaries, make their own liturgy, and, in fact, conduct all their religious concerns according to their own pleasure, without being in any way subjected to the ministers or churches of another faith; where the professors of all religions enjoy equal rights; where, in fact, government takes no cognizance of religious concerns, provided the public peace is not injured nor the rules of morality violated. To this day no Christian sect is tolerated in Portugal, Spain, Naples, Sardinia, the States of the Church, and the minor governments of Italy, but the Roman Catholic, though Jews and their worship are tolerated.

RELIGIOUS PEACE. See *Peace, Religious*.

REMAINDER, in law, is an estate limited in lands, tenements, or rents, to be enjoyed after the expiration of another particular estate.

REMAINS, ORGANIC. See *Organic Remains* and *Geology*.

REMBRANDT VAN RHYN, PAUL, one of the most celebrated painters and engravers of the Dutch school, was born in 1606, in a mill near Leyden, which belonged to his father. His passionate love for art disappointed his father's desire of educating him as a scholar. Paul received instructions from James van Zwanenburg, a painter of little note, and afterwards studied in Amsterdam under Lastmann, Pinas, and Schooten. But he soon returned home, and pursued his labours there, taking nature as his sole guide: the nature which he consulted was, however, low; his situation was by no means adapted to lead him to a conception of the truly beautiful, sublime, and ideal; and as he made no effort to correct the defects of his early education, it was natural that he should confine himself to delineations of common life, and find pleasure in them alone. Throughout his whole life, he retained both this view of art and the same mode of living, associating only with common people, and never acquiring a taste for better society. About 1630, Rembrandt removed to Amsterdam, and married a handsome peasant girl, whom we find often copied by him. His paintings were soon in extraordinary demand; and his avarice induced him to abandon his former careful and finished execution for a hasty manner. He also took a great number of pupils, of whom he received a high price for his instructions, selling their works, retouched by himself, for his own. His avaricious shifts have given rise to several erroneous statements respecting his life; thus, for example, he dated several of his etchings at Venice, to make them more saleable; and this circumstance led some of his biographers to believe that he was actually in Venice in 1635 and 1636. But he never left Amsterdam again, though he was constantly threatening to quit Holland, in order to increase the demand for his works. As early as 1628, he had applied himself zealously to etching, and soon acquired great perfection in the art: his etchings were esteemed as highly as his paintings, and he had recourse to several artifices to raise their price which are still employed by celebrated engravers. For example, he sold impressions from unfinished plates, then finished them, and, after having sold them, made some slight changes, and thus sold the same works three or four times. He would secretly buy up, at auction sales or otherwise, his own works, and then cause them to be secretly offered for sale by his son, as if they had been stolen from his father, &c. By these tricks, and by his parsimonious manner of living, Rembrandt amassed a considerable fortune.

Rembrandt was master of all that relates to colouring, distribution of light and shade, and the management of the pencil; but he has no claims to the other requisites of a true artist—composition, grouping, dignified expression, design, perspective, drapery and taste. He drew, indeed, from naked models, for which he used his scholars; but what sort of models they made, is easily perceived from his works. In his composition and grouping, he followed common nature alone, and his humour of the moment; in designing he followed his model. He generally concealed the naked parts as much as possible, rarely allowing the hands or feet to be seen, because he was unable to execute them correctly, almost always making them too large or too small. In those works where he could not avoid naked figures (for instance, in the Descent from the Cross, the Burial, and in some representations of Bathsheba in the Bath), he is entirely destitute of proportion, generally disagreeable, at least common. His drapery is fantastical, entirely without judgment, for the most part without taste, and even ridiculous. He purchased a collection of all sorts of foreign dresses, arms, and utensils, which he introduced into his pictures. Notwithstanding his great readiness of touch, his designs, even in portraits, and his drapery, are said to have cost him infinite pains. It cannot be denied that his works possess expression and character; but they have no dignity. His heads are expressive, but, for the most part, caricatured; his Marys are common women, his Christ, a man of the lowest class of people, &c. On the other hand, his pencil is masterly and unique, possessing an energy and effect belonging to no other artist; and in this consists his peculiar talent. His colouring is magical. Each tint he applied in its proper place, with the greatest correctness and harmony. His pictures are therefore all full of warmth, and his *chiaro-scuro* replete with inimitable truth. In his lights, he laid on the colours so unsparingly, that they project far from the surface, and thereby much increase the effect. He generally introduced very strong lights in his pictures. He always preferred light from above, and therefore had a small aperture made in his chamber, by which alone his model was lighted. To this uniform method it must be ascribed, that his colouring is almost always alike, and somewhat monotonous. His numerous paintings are dispersed in various public and private cabinets. The most celebrated are Tobias and his Family kneeling before the Angel; the Two Philosophers; Christ at Emmaus; the Workshop of a Carpenter; the Good Samaritan; the Presentation in the Temple; the portrait of himself and his wife; the Threatening Prisoner; Samson and Delilah; a Descent from the Cross; Christ among the little Children; the Apostle Paul; the portraits of his mother and himself; a Holy Family; Hagar; Christ in the Temple; a Burial of Christ; the Sacrifice of Manoah; the Feast of Ahasuerus; Ganymede; portraits of himself and his mother and daughter (the Girl with the Carnation); Saul and David; Tobias; a Circumcision; Himself and Family, and landscapes. Rembrandt's engravings possess a wonderful freedom, facility, and boldness, and are truly picturesque. His careless, unstudied manner agrees with the low subjects which he generally selected. His most distinguished pupils, who are easily recognised by their manner of colouring, were Ferdinand Bol, Gerard Douw, Gerbrand van Eckhout, Michael Poorter, Philip Koning, Govaert Flink.

REMONSTRANTS. See *Arminians*, and *Arminius*.

REMSCHEID; a village and parish in the duchy of Berg, now in the government of Dusseldorf, in Prussia, one of the most important manufacturing places in Germany. It is extensive, and has about 6000 inhabitants. About 400,000 scythes, many files, saws, &c., are made here annually; also steel ware of all kinds.

REMUS. See *Romulus*.

REMUSAT, JEAN PIERRE ABEL, one of the most distinguished linguists of Europe, member of the academy, and professor of the Chinese and Tartar languages at the *collège de France*, was born at Paris, Sept. 5, 1788. Having studied medicine, he received the degree of doctor in 1814, but at the same time followed his inclinations, which led him to the study of the Oriental languages, particularly the Tartar, Chinese, Thibetan, &c. In 1811 appeared his *Essai sur la Langue et la Littérature Chinoises*, which attracted the attention of the learned, and opened to him the doors of the academies at Grenoble and Besançon. Some other writings on the Chinese soon followed. In 1814, Louis XVIII. appointed him professor, and in 1816, he was admitted into the academy of inscriptions. After Visconti's death in 1818, he was appointed editor of the *Journal des Savans*. Many excellent treatises by him appeared in the *Moniteur*, in the *Journal des Savans*, in the *Fundgruben des Orients*, &c., some of which have also been published separately. His principal works, besides the *Essai*, were his *Plan d'un Dictionnaire Chinois* (1814); *Le Livre des Récompenses et des Peines* (translated from the Chinese, 1817). He also assisted in the *Mémoires concernant les Chinois* (1814, in 16 vols.), and, in 1820, made known to us a second Plato in the Chinese philosopher Lahotsé. His *Mélanges Asiatiques* (Paris, 1825, 2 vols.) contain treatises upon the religion, morals, language, history, and geography of the nations of the East. In 1827, he made the Parisians acquainted with the manners of the Chinese through his *Contes Chinois* (3 vols.) His death took place in May, 1832. Concerning his Chinese grammar, and the difference between the structure of the Chinese and the Sanscrit, Greek, German, and Latin languages, consult Alexander von Humboldt's *Sendschriben an Rémusat* (Paris, 1827).

RENARD THE FOX (in German, *Reinecke*, or *Reinicke der Fuchs*). This famous satire, in the epic form, appeared at Lubeck, in 1498, in Low German, in the Frisian dialect, under the title *Rynke de Vos*. It is an admirable satire on the intrigues practised at a weak court. The characters are animals, and the arch rogue the fox, called *Renard*, is the hero. Nothing is known with certainty respecting the author, who calls himself "Henry von Alkmaar, schoolmaster, and tutor of the duke of Lorraine," and pretends to have translated it from the French. (Meon has published the French *Roman du Renard*, written in the thirteenth century, from manuscripts, Paris, 1823). Rollenhagen, in his preface to the *Froschmäusler*, thinks Nicholas Baumann (born at Emden, in 1450) to have been the author. He was in various public employments, and a doctor of law. The wrongs which he suffered at the court of the duke of Juliers are said to have induced him to write this poem. In 1479, appeared at Gouda, in Holland, and, in 1483, at Delft, a *Historie von Reyniert de Voss*, in prose, which is considered by some as the true original, composed of several French fables. This was republished in 1783, at Lubeck. The latest editions are those of Eutin (1797), by Bredow, and of Halberstadt (1825), by Scheller. Several *rifacciamenti*, in High German, have appeared: and a part of it has been rendered into hexameters by the poet Goethe. It has been translated into several modern languages, and also into Latin. The English prose translation ought not to be taken as a specimen of the original, in which humour and wit abound.

RENDEZVOUS; the port or place of destination, where the several ships of a fleet or squadron are appointed to join company, or to rejoin, in case of separation.

Rendezvous is also a name given to any house where a press-gang resides, and volunteers are invited to enter into the navy; also a place appointed to meet in at a certain day and hour.

RENFREW; an ancient royal burgh of Scotland, capital of the county of the same name, is situated near the south bank of the river Clyde, six miles west from Glasgow, and three north from Paisley. The term *Renfrew* is variously written *Ranfrew*, *Rainfrew*, and *Renfrew*, in the old charters, and is supposed to be composed of the two British words *Ren*, or *Rhyn*, a point or promontory, and *frew*, a flux or flow; implying that the place is a point of land liable to be overflowed by the tide, which applied, at one time, to the local character and figure of a part of the parish. By the old natives themselves, the burgh is called *Arranthrew*, which we have heard explained to signify *the ford at the island*. Whatever was the original extent of the town, it does not come into notice in history, till it was created a burgh by David I. That munificent prince also endeavoured to increase its buildings and its trade, by granting to some of the monasteries ground for building, with certain rights of fishing and trading. Renfrew and the adjacent territory formed part of the estates that were granted by David I. to Walter, the first Stewart; and it thus became the burgh of a baron, in place of being a royal burgh. Walter continued the policy of this sovereign by granting pieces of ground for building, with certain rights of fishing in the adjacent waters; in particular, he granted to the monks of Paisley a full tenement in his burgh of Renfrew, and one net's fishing for salmon, and six nets, and one boat's fishing for herrings. Walter built a castle at Renfrew, which constituted the principal mansion of the extensive barony. This castle stood on a small height, called the castle-hill, on the margin of that bank of the Clyde, which formerly approached to the burgh, and it was surrounded by a large fosse. After the accession of the Stuarts to the crown, the castle of Renfrew was committed to the charge of a constable, and in the reign of James IV. this office became hereditary in the family of lord Ross of Halkhead. They had with it the island in the Clyde called the King's Inch, and a fishing in the Clyde, and they levied certain customs at the principal fairs of the burgh. On the abolition of heritable jurisdictions in 1748, lord Ross claimed for the office of constable of Renfrew, £500, but was allowed nothing. Renfrew was created a royal burgh by a charter of Robert III. in 1396, granting the burgh all its privileges of fishing, trading, levying customs, &c., for a payment to the king of eight marks yearly. This charter was confirmed by subsequent charters from James V., James VI., and Queen Anne. The old castle of Renfrew continued in existence till past the middle of last century, when, along with the lands of King's Inch, it was purchased by a Mr Spiers, a merchant in Glasgow, who here built an elegant house about 1776. and razing the castle to its foundation, planted a clump of trees on its site!

Renfrew consists of one principal street, about half a mile in length, with several smaller ones diverging from it. At the west end of the main street stands the jail, and at the east end there is a considerable bleachfield. The parish church, which stands a short way east from the cross, is of a cruciform shape, and can accommodate about 700 sitters. Though the situation of Renfrew is favourable both for trade and manufactures, it has made but little progress in either, while all the other towns in the shire have been running a rapid course of improvement.

Bishop Leslie, who lived in the sixteenth century, says, speaking of Renfrew, that it had sixty ships plying in fishing during the whole year round. Crawfurd reports that the burgh once had a little foreign trade, but that a traffic with Ireland only occupied the burgesses in 1710. A few years ago, the town mustered but half a dozen boats, with one or two sand punts. The manufacturing establishments are an extensive distillery at Yoker, on the north side of the Clyde, a bleachfield, a pottery, and a starch manufactory. In the town there are about 200 looms employed. The river Clyde at one period, by one of its branches, came close to the town, but having receded from this channel, and in more recent times having been hemmed in to its present course, the intermediate land, once inches or islands, has been greatly improved, and converted into fine arable land, while a portion of the old channel has been employed as an artificial canal betwixt the town and the river. This canal was instituted about the year 1786, when vessels of seventy tons or thereabouts were enabled to proceed from the Clyde to the town, but as the canal has been filling up and going into disrepair, it is now unable to bear vessels of a greater burden than forty tons. There is a considerable quantity of grain and other goods landed here annually, chiefly for the Paisley merchants; and the recent erection of a railroad between the burgh and Paisley must tend greatly to increase this commerce.

Before the Union, the burgh of Renfrew sent a representative to the Scottish parliament. After the Union, it joined with Glasgow, Rutherglen, and Dumbarton in sending one to the British parliament. Since the Reform bill, it now joins with Kilmarnock, Port-Glasgow, Dumbarton, and Rutherglen in sending one. The burgh has a much greater revenue than most small towns. It amounts altogether to about £1400, nearly £220 for the ferry across the Clyde, £280 for salmon fishings, and about £900 from rents of lands, property in the town, and feu duties. The market day of Renfrew is Saturday; fairs are held on the third Tuesday of May and the second Friday of June. Although Renfrew is the county-town, meetings of the freeholders and the head courts are only held in it, the seat of the sheriff being at Paisley. Population of the burgh in 1755, 680; in 1791, 1013; in 1811, 1637; in 1821, including the parish of Renfrew, 2646; in 1831, 2833.

RENFREWSHIRE; a county in the west of Scotland, bounded on the east by Lanarkshire, on the south by Ayrshire, and on all other sides by the river and frith of Clyde, except a small portion of about 1200 acres, which lies on the north side of the river, opposite the town of Renfrew. It is about thirty-one miles long from south-east to north-west, and about twenty-five miles long from east to west, its breadth varying from nine to fifteen miles. Its superficial extent forms about 150,000 English acres.

Renfrewshire appears to have formed a portion of Lanarkshire, at least to have belonged to the same sheriffdom, up to the beginning of the fifteenth century. (For the earlier history of the district, see the preceding article *Renfrew*.) In 1404, Robert III., in order to make a provision for his son James, erected a principality, consisting of the barony of Renfrew and the whole estates of the Stewarts, with the earldom of Carrick, and the barony of King's Kyle, all of which he granted in free regality to the prince, and which continued in after times to belong to the eldest sons of the Scottish monarchs. By these arrangements, the barony of Renfrew was dissolved from the shire of Lanark and put under the jurisdiction of a separate sheriff. The Sempils of Eliotstoun first appear in the records as sheriffs of Renfrewshire, and the office became hereditary in their family. Sir William Sempil was sheriff of Renfrew in 1471, and held the office for several years. He was succeeded by his son Thomas Sempil, who fell, fighting in the cause of James III., at the battle of Sauchieburn, in June, 1488. Sir John Sempil, the son and successor of Thomas, was created Lord Sempil by James IV., and fell with his sovereign at Flodden-field in 1513. The sheriffdom of Renfrew formerly comprehended the barony and parish of Bathgate in West Lothian, which belonged to the Stewarts, and the jurisdiction of the Sempil family, as sheriffs of Renfrew, extended over that barony. This detached portion was resigned, in 1530-1, to James Hamilton of Finnart, who thereupon obtained a charter for it from the king. Bathgate became then a separate sheriffdom till the abolition of heritable jurisdictions, in 1748, when it was annexed to Linlithgowshire. In 1636, Hugh, lord Sempil, conveyed to Alexander, earl of Eglinton, the heritable offices of sheriff of Renfrewshire, and bailie of the regality of Paisley, in security for the payment of £5000 Sterling, and interest for the same. The money never having been paid, these offices became the permanent property of the earls of Eglinton ho held them till the abolition of heritable jurisctions, in 1748, when Alexander, earl of Eglinn, was allowed £5000 as a compensation for their xtinction.

The county of Renfrew is considerably elevated bove the level of the sea, yet it is rather charac-erized by slight irregularities of surface than as eing of a hilly nature. Its most elevated parts re in the south-west and south-east extremities. Misty-law, in the parish of Lochwinnoch, is the ighest hill on the south-west; and Ballageich and Dunwan, in the parish of Eaglesham, are the highest hills on the south-east side of the county: the first is about 1240 feet high; the others about 1000 feet. Stanley-braes, in the parish of Paisley, are about 180 feet, and Neilston-pad about 820 feet high. The soil of the county is various. The most prevalent is a free light earth on a dry bottom, of gravel or whinstone. In the level districts, it is a deep rich dark brown loam. Nearly two-thirds of the arable land of the county is kept in grass, owing to the great demand for the products of the dairy, the garden, and the fold, arising from the vicinity of Glasgow, Paisley, and other populous towns. The climate, like that of all the western region of England and Scotland, is moist but healthy. The chief streams in the shire are the White Cart, the Black Cart, the Gryfe, and the Levern, all of which unite their waters, and fall into the Clyde below Inchinnan bridge. The White Cart rises in the moors of East Kilbride, in Lanarkshire, and, after entering Renfrewshire from the south, passes the town of Paisley, and flows to the north, till it receives the united streams of the Black Cart and the Gryfe. The Black Cart takes its rise in the loch of castle Semple in Lochwinnoch parish, and descending northward, meets the Gryfe at Walkinshaw, about two miles above the confluence of their united streams with the White Cart. The Gryfe rises in the high ground above Largs, and flows eastward till it meets the Black Cart. The Levern rises in the parish of Neilston, and, after a north-easterly course of six or seven miles, falls into the White Cart, a short way above Crookston Castle.

Coal, limestone, and freestone abound in various parts of the county. The most extensive coal-works are at Quarreltown, near the centre of the county, Polmadie, on its north-east boundary, and at Hurlet and Househill, to the south-east of Paisley. The coal-mines of Hurlet afford materials for a small manufactory of sulphate of iron, and the most extensive alum manufactory in Great Britain is carried on at the same place. Ironstone accompanies all the coal strata, and limestone is wrought in various parts of the county.

Renfrewshire, in connection with the county of Lanark, constitutes the great manufacturing district of Scotland. Its manufactures are chiefly cotton and silk goods, of which the head quarters is Paisley, while the business of weaving is carried on to a greater or less extent in every surrounding town and village. See the several articles ***Paisley***, ***Greenock***, ***Port Glasgow***, and ***Johnstone***, for details regarding the manufactures and commerce of the county.

The shire is divided into twenty-one parishes. It contains only one royal burgh, namely, Renfrew, the county town; several large towns, as Paisley, Greenock, and Port-Glasgow; and a number of villages, of which the largest are, Johnstone, Gourock, Eaglesham, Kilbarchan, Lochwinnoch, and Pollockshaws. Population of the county in 1755, 26,735; in 1801, 79,891; in 1811, 92,769; in 1821, 112,175; in 1831, 133,443. See Crawford's *History of Renfrewshire*, and Mr Wilson of the Hurlet's able *View of the Agriculture of Renfrewshire*.

RENI, GUIDO. See *Guido Reni*.

RENNEL, JOHN, a distinguished geographer, was born in 1742, and, at thirteen, was sent on board a ship-of-war as a midshipman, and served in India. In 1766, he entered into the East India company's military service, and was afterwards appointed surveyor-general of Bengal. He soon after gave to the world his Bengal Atlas, and an Account of the Ganges and Burrampooter. He returned to England in 1782, and published a Map of India, accompanied by a Memoir. Besides the works already mentioned, he was the author of Memoir on the Geography of Africa, with a map (1790); the Marches of the British Army in the Peninsula of India (1792); Elucidation of African Geography (1793); a second and third Memoir of the Geography of Africa (1799); the Geographical System of Herodotus explained (4to., 1800); Observations on the Topography of the Plain of Troy. He died in 1830.

RENNES; a city of France, with 30,000 inhabitants, formerly capital of Brittany, at present of the department of the Ille-et-Vilaine, situated at the confluence of the two rivers; 218 miles west of Paris; lat. 48° 7′ N.; lon. 41° 1′ W. Rennes contains several public buildings and literary and scientific institutions, with a public library of 30,000 volumes. Its trade and manufactures are inconsiderable. It was, before the revolution of 1789, the seat of a parliament, which was distinguished for its opposition to the arbitrary measures of the court.

RENNIE, JOHN; a celebrated civil engineer, was born in East Lothian, in 1761. His father was a respectable farmer, who gave him a good education, and placed him with a millwright. After serving out his articles, he commenced business on his own account, but, in 1783, was induced to remove to London, where his reputation rapidly increased, until he was regarded as standing at the head of the civil engineers of Great Britain. Among his public works may be mentioned Ramsgate harbour, Waterloo, and Southwark bridges, New London Bridge; the breakwater at Plymouth, and several similar structures, where submarine masonry was carried to great perfection. Mr Rennie was remarkable for steady resolution and inflexible perseverance, and was, at the same time, in the highest degree punctual and steady in all his engagements; and, although in some respects a self-taught man, he acquired the respect of the most distinguished men of science and learning in his day, and was elected a member of the royal society. His death took place in 1821.

RENTE, in French, signifies, in general, all the net income which a man enjoys without labour; therefore the profits of real estate as well as of capital.—*Rentier;* one who lives on his *rentes*. (For the French public stocks which go under the name of *rentes*, see the article ***Public Funds***, division ***French Stocks***.)

REPNIN (NICHOLAS WASILIEWITSCH), prince, a Russian field-marshal, the son of a prince of the same name, who served in the army of Peter I., was born in 1734, and distinguished himself in the seven years' war in the French army. After the elevation of Stanislaus Poniatowski to the throne of Poland, in 1764, he became Russian minister at Warsaw, and for some years governed the Poles in effect. In 1774, he was sent ambassador to Constantinople, and, in 1778, to Breslau, as general and negotiator, where he contributed to the treaty of Teschen. In 1789, he commanded the army of the Ukraine, and formed the blockade of Ismail, afterwards taken by Suwarrow. In July, 1791, he defeated the grand-vizier Yussuf. He was afterwards governor of Livonia. After the last partition of Poland, he received the government of Lithuania, and subsequently served under Suwarrow. Paul I., in 1796, made him a field-marshal, and, in 1798, sent him on a secret mission to Berlin. He died in May, 1801.

REPRESENTATIVE GOVERNMENTS. (See the article *Constitution*). The history of representative governments has not yet been written, though few works would be of more interest to the times in which we live, than one in which the various manifestations of the represenitive principle should be traced from the conquering military republics, erected on the ruins of the Roman empire, through the aristocratic institutions of the middle ages, down to the present democratic age, and in which it should be shown how all the branches of civil, and many of ecclesiastical, government, were originally blended, and gradually acquired more distinctness and purity; how the representative principle expanded in England more quickly than in the rest of Europe, and its democratic part, being transplanted to another hemisphere, branched forth with new vigour.

REPRODUCTION. See *Microscopical Animals*.

REPTILES. This department of animated beings forming the third class of vertebrate animals, according to the arrangement of Cuvier, has occupied various situations in the classification of authors. Many of this species were known to the ancients. Pliny, in his *Historia Naturalis*, has given all the information, respecting those that were known during his time, which was, however, extremely limited, in comparison to what is our present stock of knowledge. The first of the moderns who increased our knowledge respecting the *Reptilia* was Aldrovandus, a Bohemian nobleman, and a professor of the university of Bologna; he published the first volume of his Natural History in folio, in the year 1599, which was continued by his successors, and completed in fourteen volumes, in the year 1640. Gesner, a physician of Zurich, was the next who took up this subject; he published a work entitled a History of Animals, in three volumes folio, which appeared in 1620. To this work he added a treatise on Serpents. He was followed by Topsel, a British author, who published a History of Four-footed Beasts and Serpents in folio, 1518. These several works contain much curious information respecting reptiles, but so mixed up with fable, and the romance of travellers, that the accounts are not to be depended upon, and it is difficult to separate the pure matter from the dross. The animals of this class have in all ages furnished matter for fiction, from the dangerous qualities of many of the species, or the disgusting forms and frightful appearance of others. We are told that the march of the army of Attilius Regulus was arrested by the power of an African serpent, 120 feet long; and the Basilisk was said to possess the power of killing any person who looked at it, with a glance from its eyes.

But it was not until the publication of the *Synopsis Methodica Animalium, Quadrupedum et Serpentini generis*, in the year 1693, by Ray, that we had any distinct classification of reptiles which was worthy of attention. His arrangement consists of three orders; *first*, oviparous animals, with red blood, which respire by means of lungs, and which have a heart consisting of one ventricle. This order includes frogs, divided into aquatic and terrestrial, toads, and tortoises. *Second*, Lizards and their congeners, including the sauriens of Cuvier; and *third*, Serpents, or the ophidiens of Cuvier.

The next systematic writer who followed Ray was Linnæus, who arranged this class of animals under the title of *Amphibia* in his *Systema Naturæ*; these he divided into three orders; namely, *Reptilia*, *Serpents*, and *Nantes*, which last most improperly included the cartilaginous fishes: these were removed to their proper station by Gmelin, who published an edition of the *Systema Naturæ*, with additions, in the year 1758. Linnæus was followed by Klein, who, in 1755, published his *Tentamen Erpetologiæ*, in which he arranged serpents into two orders; *first*, those whose heads are distinct from the body, with an elongated tail; and *second*, those with the head not distinctly developed from the body, and provided with an obtuse tail.

The next author was Laurentini, a physician of Vienna, who published his *Specimen Medicum exhibens Synopsin Reptilium emendatam*, in 17[illegible], in which he divides them into three orders; namely, 1. *Leapers*, including frogs and their congeners; 2. *Walkers*, such as lizards; 3. *Serpents*. But this author entirely omitted tortoises in his classification.

The naturalist whose works are next worthy of notice, is Lacepede, who in 1798—1800, published his *Histoire Naturelle, General et Particulière des Quadrupedes ovipares et des Serpens*, intended as a continuation of the *Histoire Naturelle* of Buffon. His classification differs but little from that of Linnæus, but contains a great mass of new and interesting matter, and he gives more accurate details, and more precise generic distinctions than that author.

We now come to Brongniart, whose classification of reptiles far outstripped all those who preceded him. In 1799, he first made known his arrangements, which was published in 1805, under the title of *Essai d'une Classification Naturelle des Reptiles*. This has superseded all other arrangements, and has been followed by Cuvier in his *Regne Animal*. His orders are constructed upon their organization, such as generation and respiration, together with the exercise of the animal functions, such as touch, digestion, and locomotion. Founded upon these, he divides the class Reptiles into four orders; viz. 1. *Chelonians*, in which the body is covered with a shield or plate, comprehending the turtles and tortoises. 2. *Saurians*, having the body covered with scales, including crocodiles, and their congeners. 3. *Ophidians*, destitute of feet, such as serpents. *Batracians*, whose bodies are covered with a naked skin; exemplified in frogs, &c.

In the *Histoire Naturelle des Reptiles* of Latreille, published in Deterville's edition of the *Histoire Naturelle* of Buffon, as also in his *Familles Naturelles du Regne Animal*, published in 1825, he has attempted some trivial changes on the classification of Brongniart; retaining, however, all the principal features of his arrangement untouched.

Duméril, in his *Elemens des Sciences Naturelles*, has also made some changes; but these are unimportant.

Daudin published his *Histoire Naturelle des Reptiles*, in eight volumes 8vo., at Paris in 1802—1803. In this elaborate work much curious information is brought forward, and many particular facts, which were before unknown; but in his arrangement he has followed Brongniart, with some slight modification in the genera.

In the Linnean Transactions and Zoological Journal are some interesting papers on Reptiles by Mr Thomas Bell. His monography of the tortoises having a moveable sternum in the 2d volume of the Zoological Journal, and also his essay on *Leptophina*, a group of serpents, contain some valuable additions to our knowledge of reptiles.

The heart in reptiles is so constructed, that at each of its contractions, only a portion of the blood which it receives is transmitted to the lungs, the remainder of this fluid is returned to circulate again, without having passed into the lungs, and, consequently without having been subjected to respiration; hence it results that the action of oxygen on the blood is greatly less than in mammiferous animals and birds, where all the blood, by passing through their lungs, is exposed to the action of the air. Consequently, as respiration causes the heat in the blood, and gives to the muscular fibre its susceptibility for nervous irritation, the temperature of reptiles is much lower, and their muscular power greatly weaker than that of the mammalia, and birds. Therefore they are said to be cold-blooded animals. Their general habits are also much less energetic, almost all their motions consisting of crawling and swimming, and although several species run or leap, at times with considerable facility, yet upon the whole, their actions are sluggish, and their sensations obtuse, with a slow digestion; and in temperate countries they pass the winter in an almost constant state of torpidity.

The brain in reptiles is proportionably small, and not so essential to the exercise of their animal and vital functions as to the mammalia and birds; and their sensations appear to be referred to a common centre, for they continue to live, and exhibit voluntary motions long after being deprived of their brain, and in many instances after the head has been cut off. The connection of the nervous system with the muscular fibre is also less necessary to its contractions, and their muscles preserve their irritability after being severed from the body much longer than in the higher animals. The pulsations of the heart have been known to continue for many hours after being separated from the body; and even without it, the body will move for a considerable length of time. It has been observed that the cerebellum in several of the species is extremely small, which fact agrees with their slight propensity to motion.

The smallness of the pulmonary vessels in reptiles enables them to suspend respiration without retarding the circulation of the blood; this enables them to dive with more facility, and to remain longer under water than quadrupeds or birds. The cells of their lungs are also less numerous, and generally large, in consequence of their having fewer vessels to lodge on their parietes, and the lungs take sometimes the form of simple sacs, scarcely cellular in their structure.

The whole class are provided with a trachea and larynx, yet many of them are incapable of producing articulate sounds.

As their blood is cold, teguments for retaining heat are unnecessary, and instead of these, therefore, they are clothed with scales, or simply with a naked skin.

The females are provided with a double ovary and two oviducts, and the males of several genera are furnished with furcated organs of generation, but the batrachians are destitute of this organ. Those females which couple deposit eggs which are protected by a shelly covering, and those species which do not, produce soft and glary eggs, destitute of any crust. These they abandon after the deposition in some convenient situation; but there are a few species which carry them about with them. The young is hatched perfect in its form in many species; but there are other species, which, on quitting the ova, have the organisation of fishes, and whose form is not perfectly developed until after a certain time has elapsed, when they undergo a complete metamorphosis. This is well exemplified in the frog being hatched as a tadpole. These are provided with branchiæ, or gills, like fishes, and some of the genera retain these organs even after the development of their lungs. In several of the oviparous reptiles, particularly in the coluber, the young animal in the egg is formed and considerably advanced at the moment it is deposited by the mother; and there are even some species which may be artificially rendered viviparous, by simply retarding the time of laying the egg, which M. Geoffrey St Hilaire has proved by depriving the colubra of water.

The quantity of respiration in reptiles is not fixed, as is the case with mammalia and birds, but varies with the proportions of the diameter of the pulmonary artery, compared to that of the aorta. Tortoises and lizards, for example, respire much more than frogs, &c.; and hence results a much greater difference of sensibility and nervous energy than can exist between one mammiferous animal and another, or between birds.

A greater variety of form prevails amongst reptiles than is found among the mammalia and birds, and it is in the production of these forms that Nature seems to have imagined shapes of the most fantastic description, and modifying in every possible manner the general plan which she has prescribed to herself in the vertebrata, and in the oviparous class in particular.

Reptiles are endowed with five senses, but none of them in great perfection. In those species which are covered with scales or plates, the sense of touch is very obtuse; and in the species which have a naked skin, such as the frog, it is also weak, in consequence of not being adherent to the body, but envelopes it like a bag. In the serpents, the eyes are immoveable, and are destitute of eyelids; and the eyes covered with a corneous substance; in some genera, three eyelids are distinguishable, while others are destitute of sight. They have no cochlea, and only provided with a small bone under the tympanum. Their nostrils are small, and they appear to have a very weak sense of smell. They have no delicacy of taste, for almost all the species swallow their food entire, and those in which the tongue is soft and flexible, this organ serves chiefly as an instrument for the seizure of their food. None of them have true fleshy lips; and some, such as the tortoises, are provided with a horny bill, like that of a parrot; others have teeth of various forms, which are not, however, formed for mastication, but to assist in holding their prey: various serpents have hollow fangs, which they can erect at pleasure, when they open their mouths to bite, and these fangs have apertures, from which they inject into the wounds made by them an active and deadly poison. The anal opening in serpents serves for rejected matters, as well as for organs of generation.

The physical construction of reptiles varies considerably in the different orders; deviating in several essential particulars, to which no general characters will apply. The following is an outline of these particulars.

1. The CHELONIA, or Tortoises, have a heart with two auricles, and a ventricle, divided into two unequal cavities, which communicate with each other. The blood from the body is poured into the right auricle, and from the lungs into

the left, but both kinds of blood are partially mixed in passing through the ventricle; their body is inveloped by two plates, or bucklers, formed by the ribs and sternum, supported by four feet.

The envelope of the body permits no part to project, except the head, neck, tail, and four feet. The upper shield, which is called the *carpace*, is formed by the ribs, of which there are eight pairs, these are widened and reunited by denticulated sutures, and with plates adhering to the annular portion of the dorsal vertebræ, in such a manner, that all these parts are deprived of mobility. The lower shell, called the *plastron*, is formed of pieces, usually nine or ten in number, analogous to a sternum; and this has been denominated the *sternum* by the more recent writers on natural history. A frame work, consisting of bony pieces, which have been considered as analogous with the cartilaginous portion of the ribs in the mammalia, generally encompasses the upper shell, uniting all the ribs which comprise it. The vertebræ of the neck and tail are alone moveable.

These two bony envelopes being covered with skin or by scales, the scapula and all the muscles of the arms and neck, instead of being articulated to the ribs and spine, as in other animals, are attached beneath; the same arrangement is found in the bones of the pelvis, and also in all the muscles of the thigh, so that in this respect tortoises have been termed retroverted animals. The vertebral extremity of the scapula is articulated with the shield, and the opposite extremity of the clavicle with the breastplate or sternum, in such a manner, that the shoulders form a ring for the passage of the trachea and œsophagus. A third and larger bony branch, is directed downward and backwards, representing the coracoid apophysis in birds.

The lungs are extensive, and situated in the same cavity with the other viscera. The thorax being immoveable in the greater number, it is by the action of the mouth that the tortoise respires; this process being effected by keeping the jaws closed, and alternately raising and depressing the *os hyoides.* The first movement permits the air to enter by the nostrils, and the tongue afterwards closing the interior opening, the second movement forces the air into the lungs.

Tortoises are devoid of teeth; their jaws are invested by a horny covering, similar to the mandibles of birds, except in the Chelides, where they are covered with a skin only. Their tympanum and palatine arch are fixed to the cranium and immoveable; the tongue is short and bristled with fleshy filaments; their stomach simple and strong; their intestines of medium length, and destitute of a cæcum.

Tortoises lay numerous eggs, which are invested by a hard shell. These are deposited in the warm sand, under the influence of a southern sun, where they are abandoned by the parents, and are hatched in summer by the influence of the atmosphere.

The animals of this order possess great tenacity of life, and they have been known to move for several weeks after amputation of the head. They require but little nourishment and can pass whole months, and even years, without food.

II. The Sauria, or Lizards, have a heart with two auricles, and a ventricle sometimes divided by imperfect partitions and their body covered by scales, supported by four or two feet. The ribs are moveable, and partially attached to the sternum, and can be raised or depressed during respiration. The lung extends more or less towards the posterior part of the body; it frequently penetrates very far into the lower part of the abdomen, the transverse muscles of which, pass under the ribs, and even towards the neck to clasp it. Those species in which this organ is very large, possess the singular faculty of changing the colours of their skin, according to the excitement produced on them, by their wants or passions.

Their mouth is invariably provided with teeth, and in most instances, their toes are armed with nails; their skin is covered with scales, more or less compact, and in a few species with scaly granules. All the species have a tail more or less long, which is very thick at the base. Most of them have four legs, but a few have only two. They subsist on animal food. Like the animals of the former order, they deposit their eggs favourably to their being hatched, where they abandon them; the young animal is hatched perfect in its form, and never undergoes any metamorphosis.

III. The Ophidia, or Serpents, have a heart with two auricles, and are destitute of feet, consequently they are the only order of this class, to which the name reptile is strictly applicable.

Cuvier divides this order into three families. In the first, the terms *Anguines*, the teeth and tongue of which are similar to those of the genus Seps, of the preceding order, and the eye is provided with three eyelids. The second family, or the true serpents, all the genera are destitute of a sternum or the slightest development of collar bones; the ribs are articulated to each other by a convex and a concave surface, and encompass almost the entire circumference of the trunk. They are devoid of the third eyelid and tympanum. Although their heads are large, the true cranium forms but a small portion of it. Their eyes are fixed, but they are destitute of external ears. Their nostrils are short, and but slightly developed, and are generally situate at the extremity or sides of the muzzle. The tongue varies much with the species; and although it is soft, moist, long, and forked, it seems rather destined to assist in seizing their prey, than as an organ of taste. The scaly covering with which they are invested, necessarily renders their sense of touch rather obtuse. They change their skin at least once a year. The third family embraces the Naked serpents, or those remarkable animals which form the genus *Cæcilia.*

The whole animals of this order are provided with [illegible] and curved teeth, which seem rather fitted for securing their prey, than for gnawing their food. Some of the genera are furnished with pervious fangs in the superior jaw, which, when erected, press a gland or sac, in which is a deadly poison, which flows through the tube, and is injected into the wound pierced by the fangs. In many species, the jaws are [illegible] in the middle, which renders the mouth susceptible of considerable dilatation, and enables them to swallow their prey entire. The process of digestion is extremely slow in all the animals of the order; and after feeding, they assume a lethargic condition, in which they continue frequently for weeks.

Serpents possess a heart with two auricles and one ventricle, divided into two compartments, and they have only a single lung. Their circulation is slow. The only sound emitted by serpents is a hissing noise. The eggs are usually protected by a covering, or shell, which is somewhat cartilaginous; when laid, they are commonly united like a string of beads, or in the form of a wreath. Some species are, however, viviparous.

IV. The Batrachia, are provided with a heart which has but one auricle, and a single ventricle; their body is naked; most of the species are metamorphosed from the form of a fish, breathing by the branchiæ, or gills, to that of a quadruped, breathing by lungs, when in a perfect condition. Two genera, however, namely, the *Sirens* and *Proteus* they retain the gills. In the former condition the aorta leading from the heart is branched into as many stems as there are gills. In those species, the branches which lead to the gills are obliterated except two, which uniting in a dorsal artery, give off each a small branch to the lung. This fact, as shown by Cuvier, is the circulation of a fish, changed into that of a reptile.

All the Batrachian reptiles are destitute of scales, shells, or nails on their toes; the whole body and limbs being covered only by a naked skin. Their eggs have a membranous covering. In some species fecundation is performed during the extrusion of the eggs; in others they are deposited in some favourable situation, and afterwards impregnated in the same manner as the spawn of fishes.

ORDER I.—CHELONIA.

Heart provided with two auricles; body inveloped in two bony plates or shields, which are formed from the ribs and sternum; furnished with four feet.

Subdivision I.—Land Tortoises.

Testudo. Upper shell gibbous, begirt with a hard border, and united nearly all round the sides to the lower shell, feet furnished with short obtuse toes, united almost to the nails; these, as well as the head, can be withdrawn within the shell; fore feet with five nails, hinder feet with four.

Testudo radiata, the Radiated Tortoise. Pl. 78, fig. 1. Shell black, ovate smooth; provided with flattened scales, having yellow radiations; upwards of twelve inches long. Inhabits Madagascar.

Subdivision II.—Freshwater Tortoises.

Emys Europæa, European Emys. Superior shell gibbous, divided into compartments by large scales; feet provided with distinct, more or less palmated, toes, five before and four behind, armed with crooked nails.

Emys picta, the Painted Tortoise, pl. 78, fig. 2. Shell oblong, slightly convex, smooth, brown, each of the scales bordered with yellow, broadest on the anterior margin; the disk composed of thirteen, and the margin of twenty-five pieces; shell six inches long. Inhabits North America.

Cistuda. Superior plate, emarginate in front, with two notches behind; sternum with one or two divisions which are susceptible of motion; lips corneous.

Cistuda clausa, the Close Tortoise, pl. 78, fig. 3. Shell brownish black, with irregular yellow spots; scutella striated parallel to their sides; middle yellowish, and the dorsal ones carinated; anterior part of the under shell moveable. Four or five inches long. Inhabits North America.

Chelonura Serpentina. Upper shell carinated, with three processes behind; limbs incapable of being withdrawn within the shells; tail about the same length as the shell.

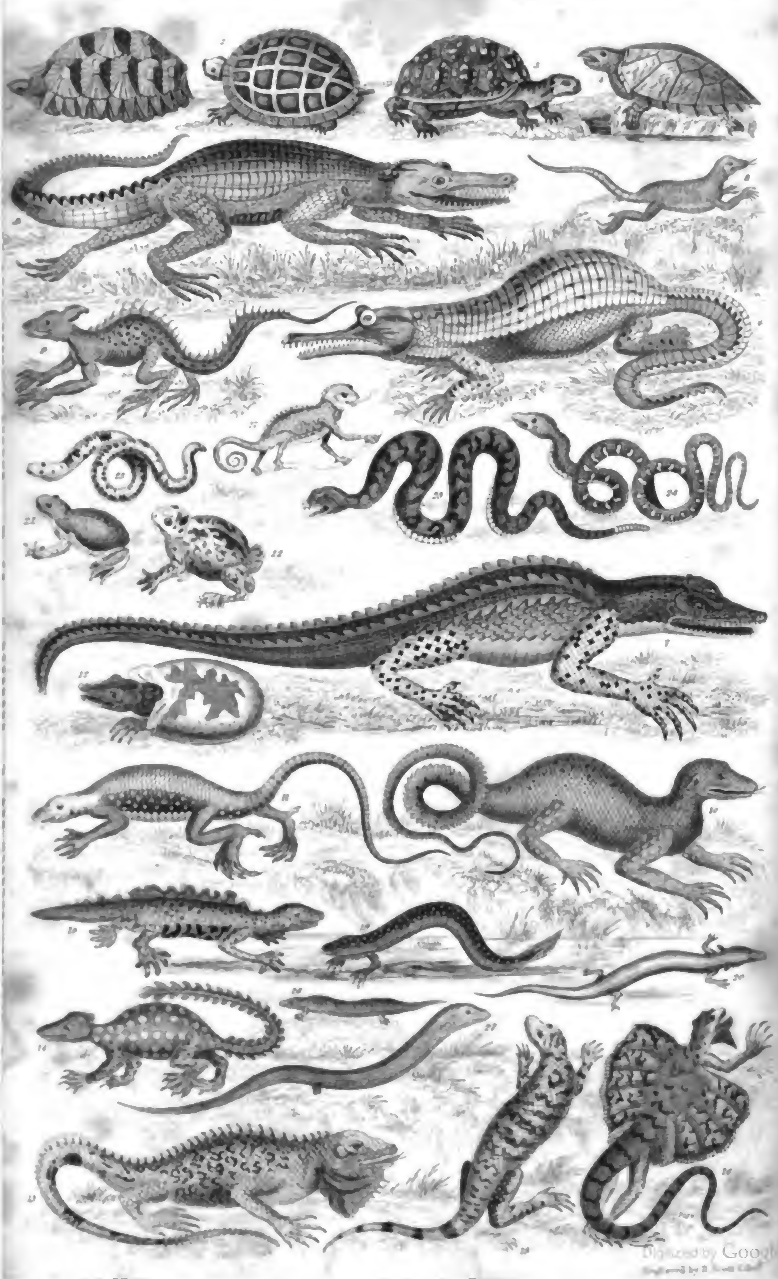
Subdivision III.—Sea Tortoises.

Chelonia. Feet depressed into scaly fins; provided with unequal toes, which are elongated, scaly, and united by a membrane, with very small nails upon their exterior border, and terminated by scaly laminæ.

Chelonia imbricata, the Hawk-billed Turtle. Pl. 78, fig. 4. Shell cordiform, with thirteen imbricated semi transparent variegated scales on the disk; marginal pieces twenty five; head small; neck long; beak narrow and sharp; from three to five feet long. Inhabits the seas of the Torrid Zone.

Chelys fimbricata. Shell not sufficiently large to cover the limbs; mouth cleft across, lips fleshy, and nose elongated into a small proboscis; toes webbed.

REPTILES.



Trionyx ferox. Upper shield destitute of scales, but in their stead covered by a coriaceous skin and near each extremity provided with hard tubercles; lips fleshy, elongated into a cylindrical tube; feet with five toes, only three of which are armed with nails.

ORDER II.—SAURIA.

Body elongated, invested with scales, generally furnished with four feet; toes armed with claws, at least in part; tail more or less long; mouth generally with numerous teeth.

FAMILY I.—CROCODILIDÆ.

Body elongated, covered with square scales, of which the upper and under are the largest, and those above, raised into a ridge or corina in the middle; provided with four feet, with five toes before, and five behind, the three interior armed with nails, and all of them more or less united by membranes; each jaw provided with a single row of acute teeth; tongue fleshy, depressed, and almost entirely attached to the lower jaw; tail compressed, and provided above with a strongly dentated crest.

The whole animals of this family are large, their bodies are covered with square, or oblong scales, of which those above form elevated lines, which are raised into a double crest on the tail. Their heads are long in proportion to the body, and ponderous; their jaws are articulated behind the cranium. Their nostrils form an elongated canal, which has its origin in the throat, and terminates at the point of the muzzle, where it is provided with a semilunar orifice, which it can open or shut at pleasure. Their eyes are furnished with three eyelids; the exterior ear is very small and can be closed at the will of the animal, by means of two fleshy coverings; under the throat there are two glands which secret a musky substance, through small orifices. The crocodiles are the only family of this order which are destitute of clavicles, or collar bones; but their coracoid apophysis is attached to the sternum, as in all the others. The eggs of crocodiles are as large as those of a goose, and are protected by a hard shelly covering. The females deposit their eggs in sand, where they are hatched by the heat of the sun, and are watched by the females, who take charge of the young for some months after they are called into being.

Gavials. Muzzle narrow, cylindrical and greatly elongated; teeth nearly of equal dimensions; hind legs dentated on the external margin; toes palmated to the claws.

Gavials Gangetica, the Gangetic Crocodile. Pl. 78. f. 6. Muzzle much elongated, narrow, as long as the head; upper jaw provided with twenty eight teeth on each side, and the lower jaw with twenty five; neck furnished with two carinated plates; eyes very large, behind each a perforation in the cranium, which is easily felt through the skin. Grows from twelve to eighteen feet in length. Inhabits the rivers of India, and is very numerous in the Ganges.

Crocodilus. Muzzle narrow, cylindrical, and greatly elongated; teeth of nearly equal dimensions; hind legs dentated and feet palmated; the fourth tooth in the lower jaw on each side lying in a long groove in the upper jaw.

Crocodilus vulgaris, the Common Crocodile. Pl. 78. f. 5. Back and superior portion of the body of a blackish brown colour, and the lower part of the sides and abdomen yellowish white; upper parts of the legs and sides varied with deep yellow, tinged in some parts with dull bluish green; the fourth tooth on both sides of the lower jaw entering into a groove in the upper jaw; back provided with six rows of square carinated plates of nearly equal dimensions; the neck having six plates, and the tail furnished with two lateral crested processes. This animal grows to the great size of from twenty to thirty feet in length. See article Crocodile.

Alligator. Muzzle broad and obtuse, provided with unequal teeth, the fourth tooth on each side of the lower jaw sheathed in a cavity in the upper one when the mouth is shut; feet semi-palmated, and furnished with dentations.

Alligator sclerops, the Common Alligator. Pl. 78. f. 7. Of a greenish brown colour above, irregularly marbled with green; the lower parts of the sides and abdomen of a pale yellow colour; the muzzle flat, and somewhat narrower than the head, with a transverse ridge uniting in front of the projecting margin of its orbits; jaws furnished with nineteen teeth on each side; and the neck provided with four rows of strong plates. Grows from eighteen to twenty feet in length. Inhabits Guiana and Brazil. See article Alligator.

FAMILY II.—LACERTINIDÆ.

The members of this family are characterised by a slender extensible tongue, terminating in two long filamentary processes, like the viper. Their bodies are elongated, and their motions rapid. All their feet are provided with five toes, armed with nails, which are separate and unequal, particularly those on the hind feet. Under the abdomen and around the tail, their scales are disposed in transverse and parallel bands. Their tympanum is on a level with the head; the eyes are protected by a produced skin, which is longitudinally cleft, and which shuts by a sphincter. Under the anterior angle there is a rudimentary third eyelid. Their false ribs do not form a complete circle.

Monitor. Head, abdomen, and tail provided with small imbricated scales; tail laterally compressed; both jaws armed with teeth, but destitute of any on the palate.

This genus is divided into sections. 1. With a compressed and carinated tail. 2. Tail nearly round, with a dentated ridge above. 3. Tail nearly round without a carinated ridge above.

Of the last section is the land Monitor, which inhabits Egypt, and is trained by the jugglers of Cairo, to perform tricks, they having previously extracted their teeth.

Dracæna. Teeth conical, and head furnished with angular plates; back with large carinated scales, which form crests on the tail; scales under the neck small; those on the abdomen and tail rectangular; tail rounded at the base, and compressed near the end.

Dracæna Guianensis. Pl. 78. f. 10. Body reddish brown, blended with green. From four to six feet long. Inhabits Guiana. Its flesh is eaten by the natives.

There are two sections of this genus, viz. 1. With a carinated tail. 2. With the tail smooth and compressed towards the point.

Teius. Teeth notched, the whole scales of the back smooth and small, under the thighs are a series of indistinct pores; scales of the abdomen longer than broad; tail more or less compressed, carinated or smooth.

There are two sections of this genus. 1. Tail carinated. 2. Tail smooth; compressed towards the point.

Teius Teguixin, the Teguixin Lizard. Pl. 78. f. 15. Body black, spotted with blue above, and of a bluish hue below; tail blended with black and blue. Nearly six feet long. Inhabits Brazil.

Ameria. Head of a pyramidal form; the scales on the throat small; abdomen and tail covered with transverse rows of square scales, those on the belly boarder than long; tail cylindrical throughout.

Ameria lemniscata, the Striped Ameria. Pl. 78. f. 11. Back furnished with nine white longitudinal lines, as also upon the sides; tail long, blue on the upper parts; thighs spotted with white dorsal lines furcated at the head. Inhabits Africa.

Lacerta. Bone of the cranium projected on the orbits and temples; palate provided with two rows of teeth; under side of the neck with a collar formed by a transverse row of minute scales; separated from the abdominal ones by a series of still smaller dimensions.

Takydromus. Body and tail much elongated; back provided with several series of square scales; thighs furnished with pores; anal region having two vesicles.

FAMILY III.—IGUANIDÆ.

Lizard shaped; with a thick, fleshy, and not extensible tongue, which is notched at the point.

Cordylus. Head simple; destitute of palatine teeth; abdomen and back covered with numerous transverse series of large scales, those on the tail forming spinous circles; thighs with a series of large pores.

Stellio. Head inflated behind; destitute of palatine teeth; with a series of spines around the ears; body covered with acute scales; spines of the tail of medium size; thighs without pores.

Amblyrhynchus. Head short, truncated, tuberculate, ventrical scale depressed; muzzle rounded; teeth numerous and trilobate; nostrils placed about half an inch above the mouth; legs strong; claws robust, and much hooked; twenty four femoral pores on each side.

Agama. With a tumid head; the skin of the throat ample and loose, transversely plicated, and adapted for inflation; body oblong, more or less robust, wholly covered with carinated scales, produced into points, which feel rough to the touch in different parts of the body, especially above the ears.

Agama muricata, the Muricated Agama. Pl. 78. f. 8. Body gray, with rows of large spinous scales set in transverse bands upon the back and tail; throat capable of inflation, and provided with scales elongated into points, which form a kind of beard on the flank and behind.

Trapelus. Head tumid; scales small and destitute of spines.

The only species of this genus is the Egyptian Trapelus, which has the property of changing the colour of its skin, in a still more remarkable degree than the chameleon.

Calotes. Scales of the body imbricated, with acute margins, those on the middle of the back rising into a crest; behind the ears it is furnished with similar scales. Upwards of a foot long. Inhabits New South Wales.

Lophyrus. Body covered with a shagreened skin; crest of the back prolonged upon the tail, which is compressed.

Basilicus. Destitute of palatine teeth; teeth compressed without notches; skin of the throat ample, but not forming a pouch; crests margined, scaly, and supported by lengthened spring apophyses of the vertebræ, extending on the back, and part of the tail at least; scales of the abdomen and tail, small and square.

Basilicus mitratus, the Mitred Basilisk. Pl. 78. f. 9. Back provided with a crest, and another on the upper half of the tail, and a third situate on the occiput; tail long and acute; from two to three feet long. Inhabits Brazil. The flesh is eatable.

There are only two species of this genus known, that above described, and the Aboyna Basilisk; they are disagreeable looking animals, but are entirely destitute of the deadly properties attributed by the ancients to the fabulous animal of that name. See article Basilisk.

Draco. Each jaw provided with four incissory teeth, long acute carines, and twelve triangular grinders; a pretty large pouch situate under the throat; six false ribs rise from the spine, and support an extension of skin, which form a sort of wing; body invested with imbricated scales; those of the tail and legs carinated: tail long, destitute of femoral pores.

Draco lineatus, the Flying Dragon. Pl. 78. f. 16. Upper part of the body variegated with blue and green; wings of a reddish brown; with white longitudinal striæ. Never exceeding nine or ten inches in length. Inhabits Asia and Africa. See article Dragon.

Iguana. Head plated; jaws with a row of compressed, triangular, serrated teeth, and the palate two rows on its posterior margin; throat with a pendant inflated skin and laterally compressed; provided with femoral pores.

Iguana vulgaris, the Common Guana. Pl. 78. f. 13. A large round plate under the tympanum at the angle of the jaws; sides of the neck provided with pyramidal scales scattered among the others; anterior margin of the throat pouch dentated; body blue above, changing to green and violet, paler beneath; dorsal spines large.

Polychrus. Head covered with plates; maxillary teeth edged and denticulated; palate provided with small ones; throat extensible and formed for inflation; destitute of a dorsal crest; body and tail covered with small scales; toes not dilated.

Like the chameleon, the animals of this genus have the power of changing colour.

Anolius. Teeth edged and denticulated, with small ones in the palate; most of the species provided with a gular pouch; tail uniformly covered with small shagreen-like scales; skin of the toes extended in the antepenult joint into an oval disk; transversely striated below; claws greatly hooked.

There are two sections of this genus. 1. With the tail crested. 2. With the tail rounded.

FAMILY IV.—GECKOTIDÆ.

Gecko. Head considerably depressed; eyes large; tongue fleshy, but not extensible; jaws provided with a series of small close-set teeth; body flattened, covered above with small shagreen-like scales, and frequently tuberculate; below, the scales are smaller, flat, and imbricated; tail with circular folds; toes widened their whole length, or at the extremity only, with the skin plated or scaly.

The animals of this genus have the power of ascending perpendicular walls, and they can even walk on ceilings. Cuvier divides the genus into the following subgenera:—

I. *Platydactyli.* Toes widened throughout, and provided below with transverse scales.

II. *Hemidactyli.* Base of the toes provided with an oval disk, formed underneath by a double row of scales; from this disk the second phalange arises, which is slender and supports the nail joint; all the toes furnished with nails; on each side of the anal opening is a series of pores; tail with large scales beneath.

III. *Thecadactyli.* Toes widened throughout their whole length, and provided with transverse scales, which are divided by a longitudinal furrow; thumbs destitute of nails; tail covered above and below with small scales; no femoral pores.

IV. *Ptyodactyli.* Toes dilated at the points only, striated underneath; nails placed in a furrow and hooked.

Ptyodactyli caudiverbera, the Scallop-tailed Gecko. Pl. 78. f. 14. The whole animal of a dusky black; the back covered with remote red tubercles, each encompassed by a circle of small white scales; thigh and tail furnished with similar tubercles, but destitute of the surrounding scales; tail provided with a scalloped fin, like a membrane on each, increasing in dimension as it approaches the tip, where it is broadest; sixteen inches long. Inhabits Arabia.

V. *Phylluri.* Animals similar in form to the Gecko, but the toes do not widen; tail depressed and cordiform.

FAMILY V.—CHAMÆLEONIDÆ.

Chamæleon. Tongue fleshy, cylindrical, and extremely extensible; teeth trilobed; eyes large, but nearly covered by a skin, and with separate movements; destitute of an external ear; occiput pyramidal; body compressed, back edged or carinated, the whole covered with small shagreen-like granules; all the feet furnished with five toes, which are divided into two sets; the one with three toes, and the other with two, each united to the nails by a membrane; tail round and prehensile.

Chamæleon vulgaris, the Common Chameleon. Pl. 78. f. 17. Head carinated over the eyes; occiput provided with a crest, which reaches to the middle space between the eyes; the whole animal covered with small uniform scales; dorsal and medial ventral line from the chin to the vent larger, naked; ventral line white. Twenty-two inches long, including the tail. Inhabits India and Africa. See article Chameleon.

FAMILY VI.—SCINCIDÆ.

Tongue not extensible; body covered with equal-sized imbricated scales; legs short.

Scincus. Tongue fleshy, slightly extensible, and [illegible] cleft; jaws provided with small close-set teeth, and the palate with two rows; body long, invested with elliptical rounded imbricated scales.

Scincus occiduus, the Galley Wasp. Pl. 78. f. 25. Body reddish, furnished with irregular whitish transverse lines; grinding teeth rounded; in front of the tympanum are [illegible] little lobes; tail very short, hardly a quarter of the total length of the animal. From twelve to eighteen inches in [illegible]. Inhabits Jamaica.

Seps. Tongue short, slightly cleft at the tip; body, neck and tail very long, cylindrical, and invested with rounded elliptical imbricated scales; feet small, the two pairs greatly apart, and provided with four or five toes.

Seps palustris, the Great Water Newt. Pl. 78. f. 18. Covered with small warts above; abdomen bright [illegible] streaked with black; back brown spotted with black. [illegible] seven inches long. Inhabits stagnant waters in Europe.

Bipes. Destitute of fore feet, the scapulars and sternum being concealed under the skin; feet slightly divided or without divisions.

Bipes apus, the Apoidal Apus. Pl. 78. f. 27. Head and body without any distinct separation; tail long and round; scales small and imbricated; two feet placed near the anal opening, with slight divisions. Inhabits the shores of the Volga.

Chalcides. Body extremely elongated; provided with [illegible] short distant feet; toes varying according to the species; scales not imbricated, but forming transverse bands, or annulations.

Chirotes. Destitute of hind feet: in other respects resembling the former genus.

ORDER III.—OPHIDIA.

Body greatly cylindrical, elongated, generally covered with scales, and destitute of feet.

FAMILY I.—ANGUINES.

With small teeth nearly of equal size; tongue moderately notched; ribs more or less united, being a substitute for a sternum; eyes provided with three eyelids.

Ophisaurus. Maxillary teeth conical, and the palate furnished with two small groups of teeth; tympanum externally visible.

Anguis. Maxillary teeth compressed and hooked, destitute of palatine teeth; tympanum concealed under the skin.

Acontias. Devoid of any vestige of a sternum or pelvis; mouth provided with conical teeth; second lobe of the lungs rudimentary.

FAMILY II.—SERPENTES.

The species of this family are very numerous, and are all destitute of a sternum and scapular bones, and want the third eyelid, and also the tympanum. Cuvier subdivides them. The first subdivision includes those which have the lower jaw supported by a tympanal bone articulated to the cranium, the two branches of this jaw fixed before, and those of the upper jaw to the cranium, and to an intermaxillary bone, which prevents their dilatation. The eyes are small, the body cylindrical and covered with scales; the tongue short; the trachea long; the heart situate far behind, and provided with a single lung only.

I.—JAWS NOT DILATABLE.

Amphisbæna. Teeth conical and not numerous, and placed in the jaws only; body encompassed by circular rows of quadrangular scales; oviparous; a row of pores [illegible] before the anal opening.

Amphisbæna fuliginosa, the Shining Amphisbena. Body variegated with black and white; head with six large scales, placed in three rows; tongue broad, rough above, forked and free; eyes small, and covered by a membrane, anal opening surrounded by eight tubercles. Two feet long. Inhabits Ceylon.

Typhlops. Snout depressed and provided with plates; tongue long, furcated; eyes hardly visible through the skin; body invested with small imbricated scales; anal opening near the extremity of the body.

II.—JAWS DILATABLE.

(1.) *Body Cylindrical, with Short Tongue.*

Tortrix. Tongue short and thick; abdominal scales, and those under the tail larger than the others; tail extremely short.

(2.) *Occiput more or less gibbous; Tongue Forked and Extensible.*

Boa. Body compressed, thickest in the middle; scales upon the posterior part of the head small, as well as those of the other parts; anal opening with a peak on each side, tail prehensile.

Boa canina, the South American Boa. Pl. 78. f. 24. Head large, body green, with transverse undulated white dorsal bands; four feet long. Inhabits South America.

In this genus are included the largest serpents, some of which reach from thirty to forty feet in length. See article Boa.

Erix. Head provided with nine large plates; teeth small and pointed; a longitudinal row of scales larger than the others, under the body and tail.

Erpeton. Head provided with large plates, and two soft prominences, covered with scales, situate at the extremity of the muzzle; abdominal plates smaller than those of the head, and those placed under the tail somewhat different from the other scales.

(3.) *Shields under the tail ranged in pairs.*

Python. Head furnished with large and numerous plates; ventral plates narrow; anal opening provided with lateral hooks.

Hurria. Under the extremity of the tail are a double row of longitudinal plates; the other parts of the body with one only.

Dipsas. Body compressed, not so broad as the head; scales on the ridge of the back larger than the others.

Coluber. Head depressed provided with nine larger plates; teeth nearly equal; destitute of poison fangs; abdomen with transverse plates, divided into two under the tail, or forming a double row.

Dryinus. Upper jaw much longer than the lower; rostrum very narrow, more or less acute at the apex, which in some species is distinctly mucronate and moveable.

Leptophis. Violet changing to green, gilded; a lateral and dorsal line of a paler hue; head obtuse.

Acrochordus. Mouth provided with two rows of teeth; body greatly thicker than the tail; body and tail invested with small uniform tuberculous scales.

(4.) *Serpents provided with Poison Fangs.*

The teeth in this section are fewer in number in the exterior row, than in the preceding section; the first of these teeth is larger than the others, it is hollow and conducts the poison from the sac into the wound.

Pseudoboa. Head short, covered with large plates; occiput somewhat prominent; back carinated with a longitudinal row of broader scales; plates of the abdomen under the tail single.

Trimeresurus. Head furnished with large plates; the plates which are under the tail, and near the anal opening, single; and with double plates near the extremity of the tail.

Hydrophis. Head small not tumid, covered with large plates; a series of scales on the abdomen somewhat larger than the others; tail compressed.

Pelamis. Occiput tumid, occasioned by the length of the pedicles of the lower jaw, which is very dilatable; head and abdomen with larger plates; those on the sides of the body small and equal; tail compressed.

Chersydrus. Head and body covered equally with scales; posterior part of the body and tail compressed.

(5.) *With isolated Fangs.*

Crotalus. Head broad, triangular and depressed; scales carinated; tongue forked; a hollow behind the nostrils; the upper maxillary bones provided with isolated fangs; plates or transverse bands under the body and tail; extremity of the tail furnished with a rattle, formed of hollow, moveable, and sonorous plates.

Crotalus horridus, the Common Rattlesnake. Pl. 78. f. 23. Body brown, with transverse irregular blackish bands; extremity of the tail black. From four to six feet long. Inhabits America. See article Rattlesnake.

Scytalus. Upper jaw furnished with poisonous fangs; destitute of hollows behind the nostrils; body and tail below with a series of transverse plates; tail devoid of a rattle.

Acanthophis. Upper jaw furnished with poisonous fangs; back part of the head tumid, and provided with scales similar to those of the back; no hollows behind the nostrils; tail with a double row of plates at its tip, and terminated by a pointed spur.

Langaha. Muzzle long and pointed, and the upper jaw provided with poisonous fangs; body anteriorly covered with small scales above; plates behind the anal opening surrounding the tail; towards the end of the tail the scales are small.

(6.) *Abdomen with Transverse Plates, divided into two under the Tail.*

Trigonocephalus. Head widened behind, in some species covered with scales similar to those of the back, in others granulated, with depressions behind the nostrils; upper jaw provided with poison fangs; tail frequently terminated by a small horny spur.

Platurus. Head covered with larger plates, and provided with poison fangs in the upper jaw; tail compressed, furnished with two rows of plates, and two larger ones at its termination.

Naia. Head covered with large plates, and the hind head provided with a hood; upper jaw with poisonous fangs; plates larger on the body than the head.

Elaps. Back part of the head the same breadth as the neck, and covered wholly with large plates; jaws with poison fangs, which are incapable of much dilatation.

Cobra. Head from the eyes to the mouth of a subtriangular shape; scales on the head carinated; upper jaw with poisonous fangs.

Vipera. Scales on the head rough or granulated; and the upper jaw provided with poisonous fangs; abdominal plates divided in two under the tail.

FAMILY III.—NAKED SERPENTS.

Cæcilia. Eyes extremely small; body cylindrical, skin naked, with longitudinal folds.

ORDER IV.—BATRACHIA.

Heart with one auricle; body covered with naked skin; lungs two, in the mature condition, but provided with branchiæ, like fishes, in their early state.

Rana. Upper jaw provided with a row of small teeth, and an interrupted transverse one in the middle of the palate; body slender; hind feet very long, muscular, and completely palmated; males furnished with a thin membrane under the ear which is inflated with air when they cry.

Rana taurina, the Bull Frog. Pl. 78. f. 21. Body olive green, spotted with black; back with a yellow line along its centre. Inhabits North America.

Hyla. Tongue short and thick; male with a gular pouch, capable of inflation; body slightly compressed, elongated, and smooth; the two fore feet provided with four toes, the hinder ones with five, all of them destitute of claws, but terminated by lenticular tubercles.

Bufo. Head furnished with a thick projection behind the ears; destitute of teeth; eyes large and protruding; body thick, short, and broad, covered with warts, which exude a fetid fluid; four feet, furnished with four toes, which are distinctly separated; hind feet short, and with five generally palmated toes.

Bufo fuscus, the Brown Toad. Pl. 78. f. 22. Body of a clear, brown colour marbled with deep brown, approaching to black; tubercles not numerous, the size of lentils; abdomen smooth; hind feet provided with elongated palmated toes. Inhabits Germany.

Pipa. Head large and triangular; destitute of a tongue; tympanum concealed under the skin; eyes small, and placed towards the margin of the upper jaw; body compressed; toes of the fore feet cleft into four small points; larynx of the male very long and triangular.

Salamandra. Head depressed; ears concealed, and with a small cartilaginous plate upon the opening; jaws provided with numerous small teeth, and two series of similar teeth on the palate; tongue, short, thick, and fixed in the lower jaw; destitute of a third eye-lid; fore feet with four toes and hind feet with five. See Salamander.

This genus is divided into sections:

1. *Terrestial*.—Tail rounded in the adult state.
2. *Aquatic*.—Tail compressed.

Proteus. Head provided with excessively small eyes, which are concealed by the skin; tongue short, thick, and free before only; body elongated, cylindrical; tail compressed; fore feet with three toes; hind feet with two, and all destitute of claws: provided with interior lungs, and persistant branchiæ.

Proteus anguinus, the Proteus. Pl. 78. f. 20. Branchiæ of a bright red or carmine hue; body smooth, grayish white; tail compressed; about twelve inches long.

This is the only species of the genus, and has several remarkable peculiarities. Besides being furnished with lungs, it has three tufted branchiæ on each side, which it seems to retain through life. The skeleton is nearly allied to that of the salamander, but is provided with more numerous vertebræ; and the general form of the cranium is considerably different. It inhabits dark subterraneous streams, in Carneola; and is the only animal known to exist in such situations. See article Proteus.

Siren. Provided with a short thick adherent tongue; having both persistant branchiæ and interior lungs; body elongated, cylindrical, and furnished with a compressed tail; it has two feet only, which are placed forwards on the body, each provided with four toes.

Siren lacertina, the Siren. Pl. 78. f. 19. Eyes small; no external ear; under jaw with teeth all around, and several rows on each side of the palate; body much elongated, blackish and spotted, resembling that of an eel. From two to three feet long. Inhabits the marshes of South Carolina.

There is but one species of this remarkable genus; which like the Proteus, retains during its life, three free branchial tufts, situate on each side of the neck. While it has at the same time lungs for breathing, formed in the ordinary manner. See article Siren.

REPUBLICS. See *Political Institutions*, and *Politics*.

REPULSE BAY. See *North Polar Expeditions*.

REQUETES. See *Maître*.

REQUIEM, in the Roman Catholic church; a solemn musical mass for the deceased, which begins

Requiem æternam dona eis, &c. (See *Exequeis*.) The requiem forms an important part of the beautiful Catholic church music; and the most distinguished musicians have employed their talents on it, as Mozart, Jomeli, Neukamm, and many others.

RESERVATION, Mental *(reservatio mentalis)*, consists in this, that a person making a promise gives a different signification or interpretation in his own mind to the words of the promise, from the meaning which he to whom the promise is made will naturally attach to them, with the purpose of deception. It is always an intentional violation of the truth, and of course of the rules of morality. It was, nevertheless, permitted among the Jesuits in its greatest extent.

RESERVE. The distribution of military forces is one of the most important parts of warfare. Generally speaking, they are divided into three parts: the first, the van, is destined to begin the conflict; the second, *corps de bataille*, to sustain it; the third, the reserve, has to supply fresh forces as they are needed, to support those points which are shaken, and to be ready to act at decisive moments. The composition and disposition of the reserve is of the utmost importance. It ought to be composed of the best and most experienced troops, not exposed, yet placed so that they can operate easily on all sides, and ought to be commanded by an experienced, cool, but resolute, general. Napoleon's guards, and his disposition of them, are models. They often decided the victory when the enemy felt sure of success.

RESIN; a vegetable substance, which exudes from many trees, either from natural fissures or artificial wounds. (See *Plants*.) Common resin, or rosin, is obtained by distilling the exuded matter of some species of pine: oil of turpentine passes over, and the resin remains behind. (See *Pine*.) The resins are insoluble in water, but soluble in alcohol, and inodorous, though they sometimes derive odour from containing an essential oil. They consist chiefly of carbon, with about one quarter of oxygen and hydrogen. See *Gum*, and *Gum Resin*.

RESPIRATION; the alternate inspiration and expiration of atmospheric air, for the purpose of bringing it into contact with the blood, and exchanging the hydrogen and carbon with which it is changed, for oxygen. (See these articles, and *Air*.) This function is therefore closely connected with that of the circulation of the blood. (See *Blood*, *Heart*, and *Lungs*.) The organs and mechanism by which this wonderful function is carried on, vary considerably in the different classes of animals. In the mammalia, birds (see *Ornithology*) and reptiles (q. v.), the organ of respiration is the lungs; in fish (q. v.), the gills; in most insects (q. v.), the tracheæ; and in the lower classes of animals, different parts of the system. The air, being brought into contact with the blood, is decomposed, its oxygen is united with the blood, and its nitrogen is returned by expiration, unchanged, with an additional quantity of carbonic acid gas. A part of the oxygen of the inhaled air is united in the lungs with the free hydrogen, and forms water, which is emitted in the form of vapour, visible at 40° Fahr. Another part of the oxygen unites with the superfluous carbon in the blood, and forms the carbonic acid gas, which passes off with the watery vapour. It is evident from observation, that oxygen gas is necessary to animal life. As to its manner of operating in the body after inspiration, opinions differ. Upon respiration depends also animal heat, which is greater, at least in the mammalia and in birds, than that of the surrounding element. (See *Animal Heat*.) The mechanical part of the function of respiration is effected by the action of the ribs and diaphragm. In the natural state, the ribs are inclined downwards, and when this series of movable hoops is raised by the action of the muscles, the cavity of the chest is enlarged. The descent of the diaphragm (q. v.) by its contraction increases this effect, and the air therefore rushes in to fill up the vacant space: the ribs then descend, and the diaphragm rises, and the air is necessarily driven out in consequence of the resulting contraction of the chest. About twenty respirations take place in a minute, and from thirty to forty cubic inches of air are inhaled at each inspiration. A man consumes about a gallon of air in the same time.

RESTAURATEUR; the French name for an eating-house, where provisions may be had ready cooked at all hours. The name has become common in other countries.

RESTITUTIO IN INTEGRUM. Where undeserved damage was suffered from the strict rules of law, or the common forms of legal procedure, the Roman pretor allowed, under certain circumstances, a dissolution of the contracts or obligations which occasioned it, and prescribed a *restitutio in integrum;* for instance, to minors, who, after their actual tutelage had expired, but before their twenty-fifth year, had entered into engagements to their prejudice; to absent persons; to those who had been influenced by fraud or threats; and, in general, whenever he found good reason for so doing (*si qua alia causa justa mihi videbitur*). The *restitutio* is, in some shape, and in certain cases, admitted into all codes. In France, actions for fraud, force, &c., are admissible for ten years after the occurrence of the cause. Actions for relief against the decisions of courts, are called there *requêtes civiles*. By the provisions of the German law, actions for restitution must be entered within four years. To support such actions, the damage suffered must have been considerable, and innocently incurred.

RESTORATION is used in many different applications. In the fine arts, it signifies the repairing of the injury suffered by works of art, buildings, statues, pictures, &c. Even in ancient times, statues were restored, as, during the civil wars, many were injured. Their transportation to Rome must also have often been injurious to them. When, after the repeated devastations of Rome, during the middle ages, statues were exhumed, many of the first artists were employed to restore them; for instance, Michael Angelo. (For much information on this subject, see the article *Restauration*, in Millin's *Dictionnaire des Beaux Arts*.) There are now in Italy some very skilful restorers of paintings, as Palmaroli, Pereira, and others. It often requires the eye of a perfect connoisseur to discover restorations, and not a few remarks on the character of ancient art have been founded on undetected restorations.

In politics, this word is used for the replacing of dethroned monarchs or houses, particularly the Stuarts in England, in 1660, and the Bourbons in France, in 1814 and 1815. This last restoration gave rise to the name of Mr de Haller's work, *Restoration of Politics*. This work is directed against the original rights of men, their equality in the eye of the law, the sovereignty of the people, and is intended to restore the theory of divine right.

RESURRECTION signifies sometimes the restoration of Christ from the dead, and sometimes the expected renewal of the human body destroyed by death. The credibility of the resurrection of Jesus Christ rests partly on the testimony of the apostles, and partly on this circumstance, that, without it, we cannot explain how the apostles, who saw their hopes disappointed by his death, and had lost their confidence in him, could have been inspired with a lively faith in his divine mission, and with a belief which gave them strength to preach the gospel amid danger and persecution. He who considers Christianity as a revelation, as an institution founded by the immediate act of God, cannot think it strange that it was established by miracles, and that Providence used extraordinary means to attain an extraordinary end. Of the resurrection of the body, men have often adopted the grossest ideas. In the notion itself, that Almighty Power can form, of the materials of the old body dissolved by death, a new body, which may serve as an instrument in a new order of things, there is nothing opposed to reason.

RESUSCITATION. See *Drowning*.

RETICULATED WALLS. See *Architecture*.

RETINA, in anatomy; a membrane of the eye, formed by an expansion of the optic nerve, and constituting the immediate organ of vision. See *Eye*.

RETORT, in chemistry; is a kind of round-bellied vessel, made of earth, glass, or metal, having a crooked neck or beak, to which the recipient is fastened. Retorts are of essential service in distillations, and most frequently for those which require a degree of heat superior to that of boiling water.

RETRENCHMENT, in the art of war; any kind of work raised to cover a post, and fortify it against the enemy. See *Intrenchment*.

RETROCESSION OF THE EQUINOXES. See *Precession of the Equinoxes*.

RETZ, JEAN FRANÇOIS, PAUL DE GONDI, cardinal de, was born at Montmirail, in 1614, and, contrary to his own inclinations, was designed by his father, general of the galleys, for the church. His instructor was the celebrated St Vincent de Paul. In 1643, he received a doctorate at the Sorbonne, and was appointed coadjutor of the archbishop of Paris. Although earnestly desiring to enter the military service, Gondi was too politic and ambitious not to bring his talents into action in the career forced upon him; and, although levity and vivacity led him to commit many actions very inconsistent with his station—his numerous amours, and affairs of honour settled by the young abbé with the sword—yet his impassioned eloquence won him the favour of the Parisians, and often served to appease the indignation of the clergy. His talents and address, together with his evident ambition of political distinction, which too often degenerated into cabal against the court party and the ministers, could not fail to draw the attention and excite the hatred of the all-powerful Richelieu, and, after his death, of Mazarin. The Fronde, or the party opposed to the court and Mazarin, received the coadjutor as a man whose genius and popularity made him a valuable accession, and De Retz embraced their cause with zeal. The intrigues which agitated the court, the various insurrections of the people and the Frondeurs, &c., offered him a wide field for the execution of his projects, and, when the court finally saw itself compelled by a decree of the parliament to release the prince Condé, and Mazarin himself (see *Mazarin*) was obliged to leave France, De Retz seemed to have attained his object, and to have it in his power thenceforth to hold the reins of government. But Mazarin soon returned from his banishment, more powerful than ever. The Fronde, which had never been firmly united, and the members of which, with the exception of Condé and De Retz, were weak and wavering, was dissolved; and, soon after, the latter, by the mediation of the court, and not without the management of his enemy Mazarin, had obtained the cardinal's hat, the storm which had just before threatened Mazarin burst upon him. At the command of the court, or rather of Mazarin, he was suddenly imprisoned in the castle of Vincennes, whence he was removed to Nantes. Here he found means to escape, and, perpetually pursued by the minions of Mazarin, wandered for nearly eight years through Spain, Italy, Holland, Germany and England, meeting with a series of truly romantic adventures. In pope Innocent, he found a powerful support; and his death was a heavier loss to Retz, as his successor Alexander, who was in some degree indebted to him for his elevation, gave him no assistance. In addition to his early extravagance and profuseness, the enormous burden of his debts was daily increased by the expenses of a princely retinue, with which he surrounded himself, partly from love of pomp, partly for protection against the persecutions of his enemy. This debt amounted to 5,000,000 livres, when Retz repaired to Holland by way of Germany. Here he dismissed the mass of his attendants, but, chagrined by his misfortunes, plunged into a course of excesses. The offers of the Spanish court, of an asylum and support, he rejected; those of Charles II. he accepted, and proceeded to England. But, as that monarch was not disposed to follow his counsels, De Retz returned to the continent, where the peace of the Pyrenees, concluded between Spain and France, opened to him a gleam of hope. But his situation was, nevertheless, so distressing, that he was on the point of printing a description of his circumstances, and of the hatred of his enemies, to be sent to the higher clergy of all countries—a proceeding from which he was only restrained by the information that his enemy Mazarin was on the point of death. But, even after the death of Mazarin, in 1661, he was not allowed to return, till he had solemnly promised never to take part again in political combinations. From this time he seemed to be a different person, and appeared before the throne with the language of a flatterer. When Louis XIV. said to him "Cardinal, you have grown gray," he replied, "Sire, one grows gray quick, who is under the displeasure of your majesty." He now resigned his archbishopric, governed the abbey of St Denis, lived retired, restricted his wants, paid his immense debts, and, besides, distributed pensions to his friends. Reconciled with all parties, the man whose comprehensive mind had hitherto taken pleasure only in the tangled web of politics, now lived quiet and retired like a philosopher. "Cardinal de Retz," says Rochefaucault, "has much elevation of mind, but more ostentation of courage than true courage; an extraordinary memory; readiness and elegance of expression. He seems ambitious, without being so; and his attacks upon Mazarin were aimed less to subvert the latter, than to render himself formidable and important to him. His imprisonment he bore with firmness, and he owed his freedom to his own boldness. As long as Mazarin lived, he maintained his archiepiscopal see, unshaken by all the vicissitudes of fortune; when his enemy was no more, he voluntarily resigned it. As a cardinal, he gained respect, by his conduct, in several conclaves. Although he had a strong propensity to pleasures and idleness, yet his activity was really astonishing as soon as it was awakened by circumstances. The presence of mind, with which he was able to understand and turn to advantage the most unlooked for circumstances, is worthy of admiration." His posthumous *Mémoires* (Cologne, 1718, 3 vols.) give an interesting picture of his character. A history of the conspiracy of count Fiesco, in Genoa, which he wrote while a youth of seventeen years of age, with a visible predilection for his hero, shows the tendency of his mind—a fact which did not escape the notice of cardinal Richelieu, when he first saw this youthful production. In the last years of his life, he rarely went to Paris. He died in that city in 1679. Some years before his death, he returned his cardinal's hat to Clement X., for the sake, as he said, of withdrawing wholly from the world; but he received it back, with the command of the holy father to retain it. See St Aulaire's *Histoire de la Fronde* (Paris, 1827, 3 vols.)

REUCHLIN, John (called also, in allusion to the signification of his name, *Capnio*), was born at Pforzheim, in 1455, of respectable parents. He distinguished himself at school by his industry and good conduct; and the excellence of his singing procured him a place in the chapel of his prince, Charles, margrave of Baden, who appointed him companion, on his travels, to his son Frederic, afterwards bishop of Utrecht. In 1473, Reuchlin accompanied that prince to Paris, to study there in the most celebrated school of the times. He was obliged to leave Paris again, in 1475, with the prince. In Basle, he excited the astonishment of his countrymen by his knowledge of languages, at that time unparalleled, displayed in his Latin dictionary (under the title *Breviloquus*), and his Greek grammar, both the first published in Germany. In 1478, he went back to France, studied law at Orleans, while he taught, at the same time, the ancient languages. In 1481, he returned to Germany, and taught law and the belles-lettres at Tubingen. Eberhard, count of Wurtemberg, soon after took him, as the best Latinist in Germany, in his train, on an embassy to Rome. The treasures of science, which Lorenzo de' Medici had accumulated in Florence, and those of Rome, were thus opened to the curiosity of Reuchlin. The emperor Frederic II. created him a noble of the empire in 1492. After Eberhard's death, Reuchlin lived several years at the court of Philip, elector of the Palatinate. Here he enriched the Heidelberg library with manuscripts, and productions of the new art of printing. The elector having been basely calumniated at the Roman court, and even excommunicated, Reuchlin repaired again to Rome, and defended the rights of his prince with equal prudence and eloquence. He was subsequently appointed president of the court of the confederacy, which had been established by the Suabian princes against the encroachments of the house of Bavaria. He was also engaged in translating the penitential psalms, preparing a Hebrew grammar and dictionary, and correcting the translation of the Bible. His agency in introducing his relative Melanchthon into the field, where he eventually exerted himself so beneficially in conjunction with Luther, places Reuchlin among the contributors to the reformation. But in an age in which ignorance and priestcraft prevailed, he could not fail of having enemies. A converted Jew, John Pfeffercorn, and one Hoogstraten, were the instigators of these blind zealots in their attacks upon Hebrew literature. They persuaded the emperor Maximilian that all Hebrew works, the Old Testament only excepted, were of bad tendency. In 1509, the emperor issued a decree, ordering all such works in his dominions to be burned; but he added, that the opinion of a secular scholar might, in all cases, be consulted: this saved the Oriental literature. Reuchlin assured the emperor that these works, instead of injuring Christianity, contributed, on the contrary, to its honour and glory, since the study of them produced learned and bold champions to fight for the honour of the Christian religion, and that to destroy these books would be to put arms into the hands of its enemies. The measure of Reuchlin served to exasperate his enemies still more. A war of pens raged for ten years. On one side were Hoogstraten and the universities of Paris, Louvain, Erfurt, and Mentz; on the other, Reuchlin and the most learned and enlightened men of all countries. Unmoved amid the revilings and excommunications of his opponents, Reuchlin finally brought this dispute before the pope, when Maximilian, regretting that he had given rise to so unhappy a controversy, declared in favour of Reuchlin. Francis von Sickingen and Ulrich von Hutten avowed themselves ready to use the sword in this contest, in case it should be necessary. About the same time appeared the *Epistolæ Obscurorum Virorum*, in which Reuchlin's enemies were rendered ridiculous. This gave the matter another turn; the umpire appointed by the pope, the archbishop of Spires, decided for Reuchlin. Reuchlin subsequently resigned his judicial station, to avoid being compelled to give a decision against his prince, duke Ulric, who had precipitately attacked the city of Reutlingen. William of Bavaria appointed him professor in the university of Ingolstadt. The plague having broken out in Ingolstadt, in 1522, he removed to Tubingen, where, retired from state affairs, he again devoted himself to study. He died at Stuttgard, June 30, 1532. See Meiner's *Account of the Life of Reuchlin* (in German).

REUSS; a sovereign principality in the central part of Germany, lying between the Thuringian forest and the Erzegebirge, bounded north by Saxe-Weimar, east by Saxony, south by Bavaria, and west by Saxe-Meiningen, and Schwartzburg-Rudolstadt. It is divided between the elder line, Reuss-Greitz, with a population of 24,100 (capital Greitz, 6300 inhabitants), and the younger line, Reuss-Schleitz (capital Gera, 8000 inhabitants), with a population of 57,690; total, 81,790, on 600 square miles. Each of the princes have a vote in the Germanic *plenum*, and the two principalities, in union with Hohen-Zollern, Liechtenstein, Waldeck, and Lippe, have the sixteenth vote in the ordinary assembly. (See *Germanic Confederation*.) Contingent of troops to the army of the confederacy, 744 men; revenue of the elder line, £13,500; debt, £18,000; revenue of the younger line, £45,000; debt, £63,000.

REVEL, or **REVAL**; a Russian naval station, the capital of the Russian province of Esthonia, on the gulf of Finland, 200 miles south-west of Petersburg; lat. 59° 26′ N.; lon. 24° 39′ E. It is built in an old style, with narrow and irregular streets; population, 13,000. Revel contains thirteen churches, an imperial palace, with public gardens, several hospitals, an arsenal, &c. The harbour, constructed in 1820, is deeper than that of Cronstadt, but is more difficult to be entered: the road, which is sheltered by islands, allows of vessels sailing with any wind. Revel was one of the Hanse towns. It was conquered by the Swedes in 1561, and taken by Peter the Great in 1710. The inhabitants are Swedes, Finns, Esthonians, and Russians.

REVELLIERE-LEPAUX, Louis Marie la, one of the members of the French directory, was born at Montaigne, in 1753, and on the breaking out of the revolution, the principles of which he embraced, became a member of the constituent assembly, and, in 1792, of the convention, where he opposed the violence of the terrorists. He was afterwards named one of the directory (q. v.); and having, in a memoir read before the institute, of which he was a member (*Réflexions sur le Culte, les Cérémonies Civiles, et les Fêtes Nationales*), recommended some religious ceremonies and principles which resembled those of the theophilanthropists (q. v.), he was, by his enemies, represented as the founder and high-priest of that sect. He refused to take the oath of allegiance to the emperor, and still later to accept the offer of a pension, on condition of his making application for it. He died in 1824, leaving *Mémoires* to be published after a given time.

REVELATION. Besides the exhibitions of divine agency in the works of nature, and the inward disclosures of divinity in the human mind, we find among almost all nations traditions of an immediate revelation of the will of God, communicated by words or works of supernatural significance or power. The nations of antiquity traced the origin of their religions, and even of their civilization, to the instructions of the gods, who, in their opinion, taught their ancestors as men teach children. As a child, without the assistance of others, would be incapable of acquiring knowledge, so the human race, in its infancy, could not have made the first step in the arts and sciences without a guide; and even if external nature, in its various objects and phenomena, were a sufficient guide to that kind of knowledge and skill which is necessary to provide for the bodily wants of man, can it be supposed that this nature could set in action his moral faculties, and open to his view the world of spiritual being? To reason, which derives its knowledge from sensual experience, the world is a riddle: the solution of this riddle—a knowledge of God and his relation to the world—could have been given only by God himself. Whatever knowledge man possesses of this subject must have been received directly, by oral communication, from the Deity, without which he could never, or at least not so soon nor so surely, have acquired it. In this revelation of himself, God adapted his communications to the comprehension of the beings for whose instruction it was intended; and we may distinguish three periods in this education of the human race in divine things. The earliest revelations, made in the patriarchal age, were common to the progenitors of all people; and their light shines through the darkness of all the heathen mythologies, which, on closer examination, plainly appear to have been built up on the simple religious notions of the primitive age, confirming the declaration of Scripture, that God has never left himself without a witness in the world. These earlier notions were preserved pure, and gradually enlarged during the Mosaic period, by successive revelations to chosen individuals, with whom the Bible makes us acquainted under the name of prophets, from Moses to Malachi. God finally completed his revelations through Christ. Thus has revelation educated the human race from infancy to manhood, and man, dismissed from this school eighteen centuries ago, has now only to make the light, thus received, known and healing to all. The evidences of this divine plan of the education of the human race, proclaimed and accomplished in the Bible, are exhibited in the history of the world. See *Christianity*.

REVELATION. See *Apocalypse*.

REVENUE. For the revenue of the different states of Europe and America, see the articles on the respective countries. See also the article *Taxes*.

REVERBERATION, in physics; the act of a body repelling or reflecting another after its impinging on it. *Echoes* are occasioned by the reverberation of sounds from arched surfaces.

In glass furnaces, the flame *reverberates*, or bends back again, to burn the matter on all sides.

In chemistry, *reverberation* denotes a circulation of flame, or its return from the top to the bottom of the furnace, to produce an intense heat, when calcination is required.

REVEREND; a title of respect given to ecclesiastics. The religious, in Catholic countries, are styled *reverend fathers*, and the abbesses, prioresses, &c., *reverend mothers*. In England, bishops are *right reverend*, archbishops *most reverend*, and the lower clergy *reverend*.

REVERSION; the residue of an estate left in the grantor, to commence in possession after the determination of the particular estate granted. The estate returns to the grantor or his heirs after the grant is over.

REVIEWS. The French were the first to establish critical journals. The *Bibliographia Parisina* of Jacob (1645) was merely a yearly catalogue of new books, without remarks of any kind; but it is said to have suggested the idea of the *Journal des Savans*, a weekly journal, instituted in 1665, by M. de Sallo, which contained analyses and critical judgments of new works. It was afterwards edited by the abbés Gallois and De la Roque, and president Cousin. From 1715 to 1792, it was conducted by a society of scholars, and appeared in monthly numbers. In 1792, it was discontinued, and revived, in 1816, under the patronage of the crown. The collaborators since its revival have been De Sacy, Langlès, Raynouard, Raoul-Rochette, Rémusat, Dacier, Quatremère de Quincy, Letronne, Biot, Cuvier, &c. The collection from 1665 to 1792 forms 111 vols., 4to, reprinted Amsterdam (1684 seq.), 381 vols., 12mo. The *Mercure de France*, begun in 1672, under the title of *Mercure Galant*, and still continued, was originally designed for the amusement of the court, and men of the world, and was very miscellaneous in its contents. The editorship, which was bestowed as an act of court favour, was sometimes in good hands, as, for example, Marmontel's. The *Année littéraire* (1754—76) acquired celebrity under the management of Fréron (q. v.) The *Journal étranger* (1754—62) and the *Journal encyclopédique* (1756—91) contained dissertations and papers of various kinds, as well as reviews. The *Revue* (originally *Décade*) *philosophique, littéraire et politique* (1794—1807), was for a time edited by Ginguené, and was distinguished for consistency of principle during a succession of most agitated periods. Millin's *Annales* (originally *Magazin*) *encyclopédiques* (1795—1818), together with critical reviews, contains a valuable mass of original essays, and a great variety of interesting intelligence relating to all countries. It has been succeeded by the *Revue encyclopédique*, which still appears in monthly numbers, on a similar but more extended plan. The *Revue* was edited till the close of 1831 by Jullien, and was afterwards conducted by M. Hippolyte Carnot. The *Bulletin universel* (q. v.), conducted by baron Ferussac, has appeared since 1824, and contains, as its name imports, information on every subject in literature, science, and the arts. The *Revue Française* was established in 1828, and has been conducted with great ability in the hands of Guizot and the duke de Broglie. The *Revue Britannique* (1825), *Revue Germanique* (1829), and *Revue Européenne* (1831), are monthly journals, devoted, as their titles indicate, to foreign literature. In most of the French journals, the names of the authors are attached to each article.

The freedom of the press in Holland led to the establishment, in that country, by learned foreigners, of some of the most valuable critical journals which have appeared any where. Acute criticism, extensive erudition, and charm of style, are united in a remarkable degree in the *Nouvelles de la République des Lettres*, edited from 1684 to 1687 by Bayle, and continued by other hands; the *Histoire des Ouvrages des Savans*, by Basnage (1687—1709); and the several journals conducted by Leclerc (*Bibliothèque universelle*, 1686—93, 23 vols.; *Bibliothèque Choisie*, 1703—13, 27 vols.; *Bibliothèque ancienne et moderne*, 1714—27, 28 vols.). Besides these are distinguished the *Journal littéraire* (1713—37), *Bibliothèque raisonnée* (1728—51), and *Bibliothèque nouvelle* (1738—44). Among the Dutch literary journals, conducted by native scholars, the principal are *De Boekzaal van Europe* (from 1692, under different titles); *Het Republyk de Geleerden* (1710—48); *Allgemenee Konst en Letter Bode* (since 1788, which is most highly esteemed in Holland); *De Recensent ook der Recensenten;* the *Vaderlandsche Bibliothek* (1790), &c.

The Italian journals of criticism are characterized by the completeness of their analyses of works: the principal are the *Giornale de' Letterati d'Italia* (Venice, 1710—33), edited at first by Apostolo Zeno, and rich in materials of literary history; the *Biblioteca Italiana* (Milan, 1816 seq.), edited until 1826 by Acerbi, and since by Gironi, Carlini, and Fumagalli, and distinguished for acuteness of criticism and freedom of judgment; the *Novelle Letterarie* (Florence, 1740), conducted for some time by the learned Lami; the *Antologia di Firenze*, which contains also original essays; the *Effemeridi Letterarie*, and the *Giornale Arcadico* (1819 seq.), both at Rome, and the *Giornale enciclopedico* (Naples, 1806), chiefly a selection from other journals. The *Giornale de' Letterati* (Pisa, 1771 seq.) was for a time edited by the celebrated biographer Fabbroni, and is one of the best Italian periodicals.

The principal literary journals of Spain are the *Diario de los Literatos de Espanna* (1737—43, 4 vols.), and the *Memorial litterario de Madrid* (1784—1807), which contain little more than an account of the contents of books. In 1831, a journal in Spanish was undertaken at Havana, under the title of *Revista Bimestre Cubana*, by Mariano Cubi i Soler.

Germany has been most fruitful in critical journals, which are more severely literary and learned than the English productions of the same kind. The earliest critical periodical is the well-known *Acta Eruditorum* (Leipsic, 1682—1776), established by Otto Mencke, and containing, besides reviews, original treatises. Thomasius's *Monatsgespräche* (1688—90), and Tenzel's *Monatliche Unterredungen* (1689, continued under the title *Curieuse Bibliothek)*, are among the earlier German journals of criticism. The *Neuen Zeitungen von gelehrten Sachen* (Leipsic, under different titles, 1715—97) gives an abstract of all native and foreign journals up to 1740. The *Gottinger gelehrten Anzeigen* (Gottingen, 1739, under different titles) was edited by Haller and Heyne, and contains contributions from Michaelis, Eichhorn, Blumenbach, Hugo, Spittler, Heeren, &c. The *Briefe, die neueste Literatur betreffend* (Berlin, 1759—65.) by Lessing, Mendelssohn, Nicolai, &c., and the *Allgemeine Deutsche Bibliothek* (Berlin, 1766—96, 118 vols., *Neue Allg. Deutsche Bib.* 1793—1806, 107 vols.), form a new period in German literature. The *Allgemeine Literaturzeitung* (Jena, 1785, transferred to Halle in 1804, edited by Schutz and Hufeland) took a yet wider range and a higher tone. On its removal to Halle, Eichhorn undertook the *Neue Jenaische Allgem. Literaturzeitung* (Jena, 1804). The *Leipziger Literaturzeitung* (since 1800, under several titles), and the *Erlanger Literaturzeitung* (1746—1810), are of inferior value. The *Heidelberger Jahrbücher der Literatur* (1808), and the *Wiener Jahrbücher der Literatur* (1818), have enjoyed considerable reputation. The *Hermes* (Leipsic, 1819, discontinued 1831, 35 vols.) was distinguished for its elevated tone, and depth and variety of erudition.

In Britain, the Gentleman's Magazine (1731), which at first consisted merely of selections from newspapers, curious intelligence, &c., is venerable for its age; it still appears, after the lapse of a century, under the editorship of Silvanus Urban (the original Urban was, as is well known, the bookseller Cave), and has acquired celebrity by the early connection of Dr Johnson with its publisher. There is an index extending from 1731 to 1786 and a second from 1787 to 1818 (2 vols., 1821), with a historical preface by Nichols. The Monthly Review (1749) was the first critical journal established in Britain; it was followed by the Critical Review (1756). The British Critic (1793) has appeared since 1827 in quarterly numbers, under the title of the Theological Review, and is the organ of the church party. A new era of periodical criticism, in Great Britain, began with the Edinburgh Review (q. v.), which took a wider range and a loftier tone, both in politics and literature, than had been assumed by any of its predecessors. The London Quarterly Review was established under the management of Gifford, in 1809, and has supported tory and high church principles. In 1825, it passed into the hands of H. N. Coleridge, and is at present edited by Mr Lockhart. The principal contributors to this journal have been Gifford, Southey, Scott, Croker, &c. These two Reviews are republished in the United States of America. There were recently published Selections from the Edinburgh Review, with a Preliminary Dissertation and Notes by Maurice Cross, and Essays, moral, political, and literary, selected from the Quarterly Review, with an introduction by Mr Lockhart. The Westminster Review (established in 1824) is the advocate of radical reform in church, state, and legislation, and was established by the disciples of Jeremy Bentham, whose principles in law and morals it supports. The Foreign Quarterly Review (established in 1827) is devoted to foreign literature. Blackwood's Edinburgh Magazine (established in 1817) though but partially occupied with critical matter, contains many able criticisms. Its politics are high tory. Tait's Edinburgh Magazine was started professedly to defend opposite principles in politics, and to assume a higher tone in literature than has been usually adopted by smaller periodicals. The other British magazines are chiefly filled with matter of local or temporary importance. We must not, however, forget to mention the Retrospective Review (14 vols., ending in 1827), devoted to notices of old works, and the celebrated Anti-Jacobin Review (chiefly political, 1798—1801).

In the United States, the principal journals of this kind are the North American Review, and the American Quarterly Review. The former was established at Boston, in 1815, by William Tudor, and at first consisted of essays, selections, poetical effusions, &c., with but little criticism. It was afterwards under the editorship of Mr Channing, now professor of rhetoric in Harvard college, and assumed more the character of a critical journal. In 1820, it passed into the hands of Mr Edward

Everett, and in 1825, into those of Mr Jared Sparks, from whom it was transferred, in 1830, to the present editor, Mr Alexander H. Everett. A general index of the twenty-five first volumes was published in 1830. The work contains a mass of valuable information in regard to American politics, law, history, &c. The American Quarterly Review (Philadelphia, 1827) is edited by Mr Robert Walsh. The Southern Review (Charleston 1828), which was very ably conducted by the late Mr Elliot and Mr Legare, was discontinued with the close of the eighth volume (1832).

REVISE, among printers; a second or third proof of a sheet to be printed; taken off in order to be compared with the last proof, to see whether all the mistakes marked in it are actually corrected.

REVOLUTION, and INSURRECTION. We shall not here go into the question of the great changes wrought in the condition of society by political revolutions, which seem necessary to its progress, but shall confine ourselves to a few remarks on the right of insurrections against established governments. There has been much speculation on the subject, whether citizens, under any circumstances, are allowed to take up arms against established authorities, and, if so, under what circumstances, &c. Without being able to enter here into all the arguments on this subject, the question may be briefly considered thus: If governments are instituted merely for the benefit of the people, it is clear that, if they have failed to answer their end, and will not submit to such changes as the people consider necessary, the people have the right, nay, are even under obligation, to overturn the existing system by force, on the general principle that all rights may be maintained by force when other means fail. The principle is so evident that it would never have been disputed, had it not been for monarchs and their supporters, who dreaded its application. In extreme cases, it is admitted by all. None, for instance, would have denied the Arabs in Egypt, or the Berbers in Barbary, the right to rise against what was called their government—a band of cruel and rapacious robbers. But at what point does this right of insurrection begin? This point it is impossible to fix in the abstract. A treatise not confined to narrow limits, like this article, might make a full statement of cases imaginary or real, and point out what was demanded in each; might hold up to view the evils of a bad government on one side, and of civil war on the other, and endeavour to show under what circumstances it was better to endure the one or to hazard the other; but it could not lay down any general rule but the vague one already given. The character of insurrections, which, while they present some of the brightest and some of the foulest spots in history, always derange the frame-work of society, is such, that they will not, generally speaking, be lightly entered into. Fanatics may sometimes take up arms from slight causes; but, generally speaking, that principle in human nature which leads men to endure the evils of established systems as long as they are endurable, will be a sufficient security against the abuse of the indefinite rule which we have stated. But while we maintain the right of insurrection, under certain circumstances, from the inalienable rights of mankind, we also admit that it can never be lawful in the technical sense of the word, because it is a violation of all rules of positive law. All the rights which a citizen, as such, enjoys, emanate from the idea of the state; and the object of an insurrection is the destruction, at least for the time, of that order which lies at the basis of the state, by the substitution of force for law. The right of a citizen, as such, to rebel, is a contradiction in terms, as it implies that the state authorizes its own destruction. An insurrection becomes lawful, in the technical sense of the word only when it has become a revolution, and has established a new order in the place of the old. We speak, of course, of insurrections against established governments. An insurrection to overthrow an usurpation is of a totally different character, as its object is the restoration of the established order, which has been arbitrarily interrupted. While, therefore, the right of insurrection is inherent in man, it can never be rationally admitted as a principle of any constitution of government; and it was equally unphilosophical and inexpedient for one of the early French constitutions to give the right of opposing by force the exercise of unlawful power; but, from the constitution of human society, it hardly seems possible to avoid the occurrence of forcible changes in political systems. Nothing in this world can last for ever; institutions established centuries ago, to answer the demands of a state of things which has long ceased to exist, frequently become extremely oppressive, from their inconsistency with the new tendencies which have sprung up in society. Sometimes the evil may be remedied without bloodshed; sometimes happy accidents facilitate a change; at other times, however, the old order of things assumes a tone of decided hostility to the new tendencies; and this is what must be expected in a large proportion of cases. Then it is that revolutions break out, and eventually establish a new order, from which new rights and laws emanate. While, therefore, the philosopher and historian acknowledge the necessity, and even obligation, of insurrections, they will, nevertheless, not fail to utter a solemn admonition against resorting rashly to this extreme remedy for violated right. There is a solidity, an authority, a completeness, in a political system which has acquired maturity by slow degrees and long struggles, that can never belong to any new system suddenly substituted in its stead. There can be no security for permanent liberty till the civic element has become developed, and men have become attached to a given system of social connexions. The common principle, therefore, of weighing the evil to be risked against the good to be gained, by a political revolution, needs to be strongly impressed upon every people in a state of political excitement.

REVOLUTIONARY TRIBUNAL. See *Terrorism*.

REYNARD THE FOX. See *Renard*.

REYNOLDS, Sir Joshua, an eminent English painter, was born at Plympton, in Devonshire, in 1723, being the tenth child of the master of the grammar-school of that town. He early discovered a predilection for the art of drawing, which induced his father to place him, at the age of seventeen, with Hudson, the most famous portrait-painter in London, with whom he remained three years, and then, upon some disagreement, returned into Devonshire. He passed some time without any determinate plan, and, from 1746 to 1749, pursued his profession in Devonshire and London, and acquired numerous friends and patrons. Among the latter was captain (afterwards lord) Keppel, whom he accompanied on a cruise in the Mediterranean. He then proceeded to Rome, in which capital and other parts of Italy he spent three years. On his return to London, he painted a full length portrait of captain Keppel, which was very much admired, and at once placed him at the head of the English portrait-painters. Rejecting the stiff, unvaried, and unmeaning attitudes of former artists, he gave to his figures air and action adapted to their characters, and thereby displayed something of the dignity and invention of history. Although he never attained to perfect correctness in the naked figure, he has seldom been excelled in the ease and elegance of his faces, and the beauty and adaptation of his fancy draperies. His colouring may be said to be at once his excellence and his defect. Combining, in a high degree, the qualities of richness, brilliancy, and freshness, he was often led to try modes which, probably from want of a due knowledge in chemistry and the mechanism of colours, frequently failed, and left his pictures, after a while, in a faded state. He rapidly acquired opulence; and, being universally regarded as at the head of his profession, he kept a splendid table, which was frequented by the best company in the kingdom, in respect to talents, learning, and distinction. On the institution of the royal academy, in 1769, he was unanimously elected president; on which occasion the king conferred upon him the honour of knighthood. Although it was no prescribed part of his duty to read lectures, yet his zeal for the advancement of the fine arts induced him to deliver annual or biennial discourses before the academy on the principles and practice of painting. Of these he pronounced fifteen, from 1769 to 1790, which were published in two sets, and form a standard work. In 1781 and 1783, he made tours in Holland and Flanders, and wrote an account of his journey, which consists only of short notes of the pictures which he saw, with an elaborate character of Rubens. He was a member of the celebrated club which contained the names of Johnson, Garrick, Burke, and others of the first rank of literary eminence, and seems to have been universally beloved and respected by his associates. He is the favourite character in Goldsmith's poem of Retaliation; and Johnson characterized him as one whom he should find the most difficulty how to abuse. In 1784, he succeeded Ramsay as portrait-painter to the king, and continued to follow his profession, of which he was enthusiastically fond, until he lost the sight of one of his eyes. He, however, retained his equable spirits until threatened, in 1791, with the loss of his other eye, the apprehension of which, added to his habitual deafness, exceedingly depressed him. He died in 1792, in his sixtieth year, unmarried, and was interred in St Paul's cathedral. Sir Joshua Reynolds, although there was scarcely a year in which his pencil did not produce some work of the historical kind, ranks chiefly in the class of portrait-painters. His Ugolino, and his Death of Cardinal Beaufort, are, however, deemed, in grandeur of composition and force of expression, among the first performances of the English school. But, on the whole, his powers of invention were inadequate to the higher flights of historic painting, although inexhaustible in portrait, to which he gave the most delightful variety. His character as a colourist has been already mentioned; and, though not a thorough master in drawing, he gave much grace to the turn of his figures, and dignity to the airs of his heads. As a writer, he obtained reputation by his Discourses, which are elegant and agreeable compositions, although sometimes vague and inconsistent. He also added notes to Dufresnoy's Art of Painting, and gave three papers on painting to the Idler. The Literary Works of Sir Joshua Reynolds were edited by Mr Malone, in two volumes quarto, in 1797, with a life of the author. Farington and Northcote have written Memoirs of his life.

RHABDOMANCY is the power considered by some as existing in particular individuals, partly natural and partly acquired, of discovering things hid in the bowels of the earth, especially metals, ores, and bodies of water, by a change in their perceptions; and likewise the art of aiding the discovery of these substances by the use of certain instruments, for example, the divining rod. That rhabdomancy, generally speaking, is little more than self-delusion, or intentional deception, is now the opinion of most natural philosophers and physiologists; still it has some champions. According to Ritter and Amoretti's accounts (see *Physical and Historical Inquiries into Rhabdomancy*, &c., in German, by Carlo Amoretti, from the Italian, with *Supplementary Treatises* by Ritter, Berlin, 1809, and Amoretti's *Elementi di Elettrometria Animale*, Milan, 1816), an acceleration or retardation of the pulse, and a sensation of cold or heat in different parts of the body, often so great as to affect the thermometer, take place in certain persons when they are in the vicinity of subterranean bodies of water or ore, &c.; also peculiar sensations of taste, spasmodic contractions of particular parts, convulsions often equal to electric shocks, giddiness, sickness, disquietude, solicitude, &c. Rhabdomancy was known even to the ancients. "From the most remote periods," says Kieser, in his System of Tellurism (in German, first volume), "indications are found of an art of discovering veins of ore and water concealed in the bowels of the earth by a direct perception of their existence." The story of Lynceus is connected with this notion. Snorro Sturleson (*Heimskringla, eller Snorre Sturlesons Nordländske Konunga Sagor*, Stockholm, 1697, folio, p. 1, c. vii.) relates that Odin knew where gold, silver, and ore lay hidden under the surface of the earth. Del Rio (Martin del Rio, *Disquisitionum Magicarum Libri sex*—Six Books of Magical Disquisitions—Cologne, 1633, quarto), relates that there were some Spaniards, called *Zahuris*, who saw things concealed under the surface of the earth, such as veins of water and ores, and also dead bodies, &c. The instruments of rhabdomancy are known under the names of the *sidereal pendulum*, the *bipolar cylinder*, and the *divining rod*. The magnetic pendulum consists of a small ball of almost any substance (for example, metal, sulphur, wood, sealing-wax, glass, &c.), which is suspended from an untwisted string, such as the human hair, unspun silk, &c. In using this, the string of the pendulum is held fast between two fingers, and remains suspended over the sidereal substance (for example, a plate of metal, or a cup filled with water and salt), without motion. If, now (say the advocates of rhabdomancy), the person who holds the pendulum possesses, in any degree, the magnetic susceptibility (the rhabdomantic quality), the pendulum will move in a circular orbit, with some differences, according to circumstances. These circumstances are the substance of the pendulum and of the objects under it, the distance of the pendulum from these objects, and the nature of the person who holds the pendulum, and of those who come in contact with him, &c. The principal difference of the motion of the pendulum is, that it moves, in some cases, from left to right, that is, with the sun; in others, from right to left, or against the sun. That the mechanical motion of the finger does not produce the vibration of the pendulum, at least in many cases, appears from accurate observation of many experiments of this kind; and the circumstance is, moreover, remarkable, that the brations do not ensue unless the hand of a living person comes in immediate contact with the string. The bipolar cylinder consists of a body having two poles, and easily moved, as, for instance, a magnetic needle, or a cylindrical bar, of two different metals; any light cylindrical body, such as a quill with the feathers on, will serve. The diviner holds the cylinder in a perpendicular direction, between his thumb and fore-finger, while with his other hand he touches some magnetic body, as, for instance, a metal. Under these circumstances, a slow, revolving motion of the cylinder takes place between the fingers, which likewise, as in the case of the pendulum, sometimes moves in a forward and sometimes in a retrograde direction, according to circumstances. (For the divining rod, see the article under that head.) The two ends of this rod are held in the hand, so that its curvature is inclined outwards. If the person who holds the rod possesses the powers of rhabdomancy, and touches the metallic or any other magnetic substance, or comes near them, a slow, rotatory motion of the rod ensues in different directions, according to particular circumstances; and, as in the other cases, no motion takes place without a direct or indirect contact with a living person. In the south of France, and in Switzerland, this art is frequently made use of under the name of *metalloscope* (the art of feeling or discovering metals), and of *hydroscope* (the art of feeling or discovering water). In the practice of this art, the direction, duration, and other circumstances, of the motion of the instruments, determine the quality, quantity, distance and situation of the subterranean substances, or the different sensations of different rhabdomantists, are taken into account.

RHADAMANTHUS was the brother of Minos, the first lawgiver of Crete and the Grecian world. According to another tradition, Rhadamanthus himself laid the foundation of the Cretan code of laws, which his brother Minos only completed. He, probably, belonged to the family of Dorus (a descendant of Deucalion), whose son Tectamus, or Teutamus, went to Crete with his son Asterius (who was, probably, the father of Rhadamanthus and Minos), in that time of general emigration in Greece. Rhadamanthus, and Minos and Æacus, the progenitors of Achilles, were the three judges, who administered justice to the dead at the entrance of the kingdom of spirits, near the throne of Pluto, continuing the occupation in which they had spent their earthly existence; for it was then the common opinion of the Greeks that the spirit, which arrived in the dark kingdom of Tartarus, strove to continue the business of life. The whole notion of Tartarus, however, in this view, was rather a philosophical allegory than a true mythus.

RHÆTIA included the two countries of Rhætia Proper and Vindelicia, which were afterwards separated under the names of *Rhætia Prima* and *Secunda* (First and Second Rhætia). The former, or Rhætia Proper (*Rhætia Propria*), extended from the Rhine to the Norican Alps, and from Italy to the borders of Vindelicia. It contained the rivers Rhine (*Rhenus*), Inn (*Ænus*), Adige (*Athesis*), and many smaller ones, and included the modern Vorarlberg and Tyrol, with a part of the country of the Grisons. At an earlier period, the Etrurians, under their leader Rhætus, took possession of this mountainous region; but, being afterwards driven out by the increasing power of the Gauls, they went to Italy, where they played a conspicuous part in its early civilization. Justin, Pliny and Stephen the Byzantine, therefore, called the Rhætians an Etrurian race. (See *Etruria*.) Among the Gauls who subsequently occupied this country, the Brenni are more distinguished by name than by importance. The Romans planted colonies here as in the other provinces; among which Tridentum (*Trent*), Bellunum (*Belluno*), Bauzanum (*Bolzano*), Bilitio (*Bellinzona*), Clavenna (*Chiavenna*), and Curia (*Coire*), were the principal. Several of these cities, however, were only indebted to the Romans for their extension and embellishment. The Rhætians repeatedly laid waste the Roman territories, in conjunction with the Gauls, and Augustus, therefore, sent his step-son Drusus against them. The latter defeated them (16 B. C.) near Trent; but as this victory was not decisive, he undertook, with his brother Tiberius, a second campaign, in which Tiberius attacked the Vindelici from lake Constance, while Drusus advanced against the Rhætians by land. In this expedition, the Romans were victorious, and both countries were made Roman provinces. Rhætia Transdanubiana, the country on the left bank of the Danube, was well known to the Romans, but never conquered by them. After the fall of the Roman power, the Alemanni and Suevi occupied these provinces.

RHÆTIAN ALPS. See *Alps*.

RHAMAZAN, or RAMADAN; the ninth month in the Turkish year. As the Mohammedans reckon by lunar time, it begins each year eleven days later than in the preceding year, so that in thirty-three years it occurs successively in all the seasons. In this month the Mohammedans have their great fast daily, from sunrise to sunset. This fast and the Bairam (q. v.) feast, which immediately follows it, are the two principal Mohammedan festivals.

RHAPSODY (from the *Greek*) was originally a series of poetical effusions, which, though separate, yet had still a connexion with each other, as, for example, the poems of Homer. Those wandering minstrels among the ancient Greeks, who sang the poems of Homer (these were also called *Homerides*), or their own composition, were called *rhapsodists*. They derived their name, according to some, from the staff which they carried in their hand; according to Pindar, however, they were thus named from their connecting together many detached pieces of poetry. At present, we understand by *rhapsody*, a collection of poetical effusions, descriptions, &c., strung together, without any necessary connexion.

RHEA. The older deities of the Greek mythology are enveloped in such a mist, that we often find the mythuses of different ages and people combined together, as is the case with the mythological accounts of Rhea and Cybele. Rhea was a Titanide, and of Grecian origin, while Cybele was of Phrygian derivation; they were first confounded, probably, in Crete, on account of the similarity of their attributes. Still the evidences of their independent origin are visible; and, although we are acquainted with the mythus of Cybele only through that of Rhea, yet the latter was finally swallowed up by the former. Rhea, one of the most distinguished of the Titanides (see *Titan*), was the sister and wife of Saturn, and with him a symbol of the first creation. Rhea, the Flowing (from ῥεῖν to flow), is the symbol of the struggle between chaos and order. The former is yet superior; by the side of Rhea is Saturn, jealous of the new forms, and annihilating them at the moment of their creation—the symbol of all-devouring time. But in the end, order must prevail; the decisive moment has arrived; by the advice of Gaia, her mother, Rhea gives a stone, instead of her infant, to her husband Saturn, who terrified by ancient prophecy (see *Saturn*), had swallowed his children at the moment of birth. She thus saves from destruction three sons and three daughters, Jupiter, Vesta, Ceres, Juno, Neptune and Pluto, the new inhabitants of Olympus, and overthrows her own power. She continued to retain the power of prophecy; and some traces of her were preserved in the mysteries, in which, however, she was confounded with Cybele. As the preserver of the future sovereign of gods and men, she was the symbol of the productive power of nature, the preserving and life-giving principle of the world. Her attributes, as the tamer of lions, which are harnessed to her chariot, and as the companion of Bacchus, and her crown of turrets, point to the same symbol. Her worship was the rudest form of natural religion, and was attended with the greatest excesses of licentiousness and cruelty.

RHEA, SYLVIA, lived about 800 B. C., and was the daughter of Numitor, king of Alba, in Italy. Although a vestal virgin, from the embrace of Mars, she brought forth twins, Romulus and Remus, the founders of Rome.

RHEIMS, OR REIMS (Remi); a city of France, department of the Marne, ninety miles north-east of Paris; lat. 49° 14′ north; lon. 4° 2′ east; population, 38,000. Rheims is a very old town; the streets are, in general, broad and regular, the houses well built, and there are numerous large gardens. It contains some remarkable public buildings, among which are the *hôtel de ville*, finished in 1825; a magnificent cathedral of the twelfth century, one of the finest monuments of the kind in France, with a portal of great beauty; and the church of St Remy, in which was preserved the holy oil used in the consecration of the kings. (See *Ampulla*.) The coronation of the French kings from the time of Philip Augustus (1179) to Charles X. (1825), with the exception of Henry IV., crowned at Chartres, Napoleon, crowned at Paris, and Louis XVIII., who was not crowned at all, took place in the cathedral of Rheims (see *Coronation*); but this expensive ceremony was abolished in 1830. This town was the scene of some hard fighting between the French and Russians, in 1814. The latter took possession of Rheims, March 12, but were driven out by Napoleon, then on his march from Laon, on the 13th, with the loss of their general, St Priest, and 2000 men. See *Châtillon, Congress of*.

RHEINGAU; a part of the duchy of Nassau, along the right bank of the Rhine, about five leagues long. It is well peopled, and produces some of the choicest Rhenish wines. *Gau* is a German word, signifying *district*.

RHENISH CONFEDERATION. See *Confederation of the Rhine*.

RHENISH OR RHINLAND FOOT; equal to 1.023 English, or 24 Rhenish equal to 25 English. See *Measures*.

RHENISH WINES; the finest wines of Germany. The vines on the Rhine were planted in the third century, under the emperor Probus. According to a still existing tradition, Charlemagne transplanted the first vine in the Rheingau from Orleans. The Rheingau is the true country of the Rhenish wines. The best are those of Assmannshausen (chiefly red), Rudesheim, Rottlander, Hinterhauser, Geissenheim, Johannisberg (q. v.), the best of all, of which a bottle of the first quality, in ordinary seasons, costs, on the spot, from four to five florins, and Hattenheim (called *Markebrunner*). Besides the wines of the Rheingau, the following are good Rhenish wines: on the left bank, the Niersteiner, Liebfrauenmilch (translated, Our Lady's Milk), a mild wine growing near Worms, Laubenheimer, Bacheracher; on the right bank, Hochheimer. Among these wines, the Laubenheimer and Assmannshäuser are the most agreeable; the Hochheimer, Johannisberger and Geisenheimer, the most aromatic; the Niersteiner, Markebrunner, Bacheracher and Rudesheimer, the strongest and most fiery. Among the best vintages are those of 1748, 1760, 1762, 1766, 17 1779, 1780, 1781, and more particularly those of 1783 and 1811; also that of 1822. Rhenish wines improve much with age, and continue improving longer than any other wines. Some wine-cellars, as that of the city of Bremen, have Rhenish wine above 150 years old. See also *Hock*, and *Moselle Wines*.

RHETORIC is the art of clothing the thoughts in the most agreeable and suitable form, to produce persuasion, to excite the feelings, to communicate pleasure. Speech is addressed to the understanding, the will and the taste; it treats of the true, the beautiful and the good; and is, therefore, didactic, critical, and pathetic or practical. These different objects are often united in the same work, which, therefore, partakes of all the three characters above mentioned, but, at the same time, one or the other character so far prevails as to give a predominant temper to the whole. In a narrower sense, *rhetoric* is the art of persuasive speaking, or the art of the orator, which teaches the composition and delivery of discourses intended to move the *feelings* or sway the will of others. These productions of the rhetorical art are designed to be pronounced, in the presence of hearers, with appropriate gesture and declamation; and they often, therefore, require a different style of composition and arrangement from those works which are intended for readers, or simply to be read and not oratorically declaimed, and which are embraced in the jurisdiction of rhetoric in its widest sense. The Romans distinguished three kinds of eloquence—the demonstrative, occupied with praise or blame, and addressed to the judgment; the deliberative, which acts upon the will and the inclinations by persuasion or dissuasion; and the judicial or forensic, which is used in defending or attacking. The Greeks divided discourses according to their contents as relating to precepts (λογοις), manners (ἠθη), and feelings (παθη), and as, therefore, calculated to instruct, to please, and to move—a division easily reconcileable with the former. The Romans had, also, a corresponding division into the *genus dicendi tenue, mediocre* and *sublime*. Another division of eloquence, founded on the subject to which it relates, is into academical, sacred (pulpit eloquence) and political. The two latter only allow of the lofty flights of eloquence. In the wider sense, as above explained, rhetoric treats of prose composition in general, whether in the form of historical works, philosophical dissertations, practical precepts, dialogues, or letters, and, therefore, includes the consideration of all the qualities of prose composition, purity of style, structure of sentence, figures of speech, &c.; in short, of whatever relates to clearness, preciseness, elegance and strength of expression. In the narrower sense of rhetoric, as the art of persuasive speaking, it treats of the invention and disposition of the matter. The latter includes the arrangement of the parts, which are the exordium or introduction, narration (when necessary), proposition and division, proof or refutation, and conclusion or peroration, and the elocution, which relates to the style, and requires elegance, purity and precision. The delivery, or pronunciation, also falls here. Aristotle, Cicero and Quintilian are the principal writers on rhetoric among the ancients; and the most valuable English works on this subject, are Campbell's Philosophy of Rhetoric, Blair's Lectures on Rhetoric, and the Elements of Rhetoric by Whately (now archbishop of Dublin).

RHETORICIANS AND GRAMMARIANS. 1st. Those who were skilled in language were called, by the ancient Greeks and Romans, *grammarians*, or *philologists*. Their studies embraced every kind of literary productions (γραμμα, writing), and whatever might be necessary to illustrate and explain them. But the grammarians, who were called also, at first, *critics*, and by the Romans *literati*, occupied themselves chiefly with the explanation and criticism of the earlier poets. They were distinguished from the grammatists (*grammatistæ*, *literatores*) by deeper and more extensive erudition; the grammatists treating mainly of the elements and rudiments of knowledge. We find the first examples of scientific researches into language among the *sophists*, who, in the age of Pericles, practised themselves in their schools, in the explanation of the poets, and particularly Homer, for the purpose of cultivating the taste, and exercising the critical powers; and their ingenuity was principally occupied upon difficulties of their own raising. By this practice, they taught their pupils to examine the laws of language accurately, and observe them carefully. Some of the scholars of Socrates, especially Plato, also distinguished themselves by their illustrations of the poets. Aristotle, who is called the founder of criticism and grammar, made a revision of the Homeric poems for Alexander the Great, and attempted to purify them from interpolations. Before him, however, Pisistratus is related to have arranged the poems of Homer in the order in which they now stand, and Cynæthus of Chios, Antimachus of Colophon, Theagenes of Rhegium, and some others, had occupied themselves with the interpretation of Homer. But although some individuals had turned their attention particularly to the explanation, or the emendation, of the ancient authors, the science of language and criticism was carried to much greater perfection by the Alexandrian scholars. After Alexandria had become the seat of science, the rules of the Greek language, the laws of the interpretation of authors, and the explanation of mythology, the rules for the determination of the various readings, and the particular merits of separate passages, or whole books, became subjects of study. The age of the Alexandrian grammarians (see *Alexandrian School*) is, therefore, the first period in the history of the ancient grammarians: they decided the relative rank of the authors who were to be considered as models of taste, revised some of their works, illustrated them with various researches, unravelled and explained mythology, composed lexicons upon individuals or upon bodies of authors, collected the rules of grammar, and judged the faults and merits of writings, which is the province of the higher criticism. To refer to remarks of different kinds upon the margins of the books, the grammarians made use of critical marks and signs. Different signs were used for different authors. Among the grammarians of this age, Didymus of Alexandria, who lived in the time of Augustus, deserves to be mentioned as a critic: he was surnamed ὁ χαλκεντερος (Ironsides), because he wrote 4000 books. The second period embraces the period of the New Platonists, who considered these objects of inquiry important enough to occupy their attention. The critics and grammarians of this age generally turned their attention more to the thoughts of authors and the contents of their works, than to the explanation of words or the laws of language. In all of them, the spirit of their scientific system, founded upon religion, is apparent; few of them penetrated the peculiar character of Grecian antiquity. This period commences with Plutarch of Chæronea (A. D. 100), to whom some critical and grammatical writings are attributed, which are, however, unworthy of him. The third period embraces those grammarians, mostly monks, who diligently compiled from the ancient authors, collected dictionaries from different writings, gave rules for preserving the purity of the Attic dialect from individual authors, or made annotations on the margins of manuscripts. Many grammatical works of this age are yet extant, in judging of the intrinsic value and utility of which, not only the qualifications of their authors, but more particularly the purity of the sources whence they drew, must be taken into consideration. This period includes those Greeks, who, fleeing from their country, first revived a taste for the study of Greek in Italy, at the end of the fourteenth, and particularly in the fifteenth century. Some collections of the Greek grammarians were made in the fifteenth and sixteenth centuries, among which the *Cornucopia et Hortus Adonidis* (Venice, 1496, folio), and Alexander Heladius's Gleanings of the Greek language, are worthy of notice. Neither Grecian literature, in general, nor grammatical studies, were cultivated by the earlier Romans; they were looked upon by the multitude as a waste of time, and by patriots, as hurtful to morals, while the state was yet rude and warlike, and the want of a more refined taste was not yet felt. But acquaintance with the Greeks attracted the attention of many to this subject, and some of the most distinguished men—Scipio Africanus and Caius Lælius, for example—encouraged the cultivation of Grecian learning. The first Roman teachers of grammar, Livius Andronicus and Ennius (B. C. 236—166), who were in part of Grecian descent, and wrote both in prose and poetry, made translations from some Greek authors. A general taste for philological learning, and the auxiliary sciences, among the Romans, was promoted by the mission of the Greek critic and grammarian Crates of Mallus, a contemporary of Aristarchus, to the Roman senate, as ambassador of king Attalus Philadelphus, soon after the death of Ennius (B. C. 170): during his long residence there, he delivered lectures from time to time, and his lessons awakened, among the Romans, a disposition to imitate the example of the Greeks. As Grecian science became the standard to which the Romans attempted to conform, the latter preserved, in its full extent, the Grecian idea of the science of language, and the Roman dialect of the Latin language became, under the influence of the Grecian, the language of books, and of the cultivated classes. The grammatical studies became so popular, that the most distinguished men wrote upon them; and there always continued to be schools of reputation in Rome. The teachers received very high prices for tuition; and Marcus Scaurus gave about 16,000 dollars for a learned slave, Lutatius Daphnis, and soon after set him at liberty; and Lucius Apuleius received a salary of nearly 10,000 dollars a year, from a rich Roman knight, for his lessons. The study of grammar was likewise diligently prosecuted in the provinces, and some of the most distinguished teachers were in Gaul. With the increase of literary works in the Roman language, increasing attention was paid to the primitive Latin tongue, and to Roman literature and antiquity. Suetonius devoted a particular treatise to the oldest Latin grammarians, in which he gives accounts of their lives and writings. The extant writings of the later Latin grammarians are to be found in the collection of Elias Putsch (Hanau, 1605, 4to.) Vespasian and Adrian confirmed to the grammarians the privilege of exemption from civil services and burdens. Private citizens also took an interest in the schools, and supported them at their own expense. As, in the earliest times, instruction in grammar and music was given by the same person, the ancient grammarians also gave lessons in rhetoric; and many are distinguished as authors in both departments. Even after the sciences had become distinct, the grammarians still continued to teach some of the elementary branches of rhetoric, and, in earlier times, orators passed directly from the school of a grammarian to take part in judicial proceedings.

2d. Instructors in eloquence were called *rhetoricians* among the Greeks; and they also bore the same name, or that of professors (*professores*), among the early Romans. The invention of rhetoric is ascribed by the Ægyptians and poets to Thoth, Hermes, or Mercury, as, in ancient times, the mental powers and operations, in general were looked upon as something divine. Pittheus, the uncle of Theseus, is said to have first taught this art at Trœzene, in the temple of the Muses, and to have composed a treatise upon it; but this, at so early a time, is incredible. Some consider Empedocles (B. C. 444) as the inventor of rhetoric, of which he may have laid the first foundation; others, Corax and Tisias of Sicily, who first reduced the rules of rhetoric to writing, when, in consequence of a revolution there, many disputes arose concerning property, and the want of a style of speaking suitable for courts of justice was much felt. Some ascribe the invention of rhetoric to Gorgias of Leontium, in Sicily, a pupil of Empedocles, as he was the first who made use of the artificial figures and forms of speech. Others have recognised Aristotle as the inventor of rhetoric, who, in fact, first gave it a scientific form. We find two sects of rhetoricians mentioned, the Apollodorians and Theodorians, so called from Apollodorus of Pergamus, who was the teacher of the emperor Augustus at Apollonia, and from Theodorus, to whose lessons the emperor Tiberius is said to have attended at Rhodes. The object of Grecian rhetoric was to represent every thing so as to give it the appearance of plausibility and truth. Before Aristotle, the sophists, the successors of Zeno, the Eleatic, in dialectics, were teachers of eloquence: arrogant, vain, avaricious, and selfish, they endeavoured to win admiration by their dexterity in speaking on all questions, even without preparation, and to gain influence by the arts of persuasion, at a time when wealth, luxury, licentiousness, and the splendour of political eloquence, which (particularly in Athens, where it was favoured by democratic institutions, and had arrived at its full maturity) invited to such a study (in the 84th Olympiad, or B. C. 440.) As art naturally precedes science, the practice of eloquence is of earlier origin than the rules of rhetoric. The rhetoricians drew their rules and examples from the master-works of the orators, whose name (ῥητορες) was afterwards applied to them. But this mode of proceeding was changed about the time of the Ptolemies, when two ingenious and learned critics, Aristophanes and Aristarchus, taught in Alexandria. They selected ten Attic orators (whose lives are given in a work ascribed to Plutarch) as models of imitation, whose works they analyzed, and from them derived their principles. But while the art of oratory was older than the science of rhetoric, the latter long survived the former, continuing its instructions even to the time of Theodosius the Great. Eloquence flourished at Athens only 150 years, and perished, with every thing noble and great, on the overthrow of liberty, under whose patronage it had flourished, and whom it in turn defended. It was carried to Asia Minor, Rhodes, where Æschines introduced it at the time of his banishment, and other islands, but, in these wanderings, lost its original charms, and was corrupted by foreign manners. Thus arose the distinction of the Attic, Asiatic and Rhodian orators. A sparing use of ornament, combined with a judicious abstinence from striking contrasts, characterized the Attic style. The Asiatic eloquence indulged in a greater fulness of expression, and a free use of rhetorical ornaments. The Asiatic orators, particularly those of Lycia and Caria, were addicted to a sort of rhythmical close of their sentences. The Rhodian eloquence is said to have preserved a medium between these two. Eloquence was finally transplanted to Rome by Greek teachers, where it shone with a new splendour; and Cicero appeared as the greatest public orator of his country. But here, also, after arriving at the highest perfection, it began gradually to decline; for, when freedom of speech was restrained, public eloquence ceased to be esteemed. The old sophists certainly did an important service by the establishment of schools of oratory: at one time, they were the only public teachers of rhetoric, and they encouraged the youth to aim at the glory of eloquence, both by instruction and practice, and by their own example, as declaimers (*declamatores*). The sophists were distinguished by a purple gown, which was a sort of official dress. At Athens, no one, and particularly no foreigner, was allowed to assume this dress without the consent of the fraternity of the sophists, and without having been admitted into the order: the Roman emperors also prohibited those who were not regularly qualified from teaching declamation. Besides other secret usages in the Greek ceremony of admission, the candidates were led to a public bath. After the bath, the person received the mantle, by the authority of the president of the department of eloquence, to whom he paid a large fee for this permission. With the mantle, the initiated person received the dignity and name of a sophist. They who in this manner had obtained the rank of a rhetorician, spent their time in teaching oratory, and engaged in various rhetorical exercises with their scholars. The principal design of rhetorical instruction was to prepare the scholars for conducting legal processes, in which every thing was transacted orally. Those who, in the rhetorical schools, practised themselves in speaking upon supposed cases, and their pupils, were called *scholastici*; but this name was finally brought into contempt. The rhetorical instruction of the sophists consisted chiefly in arts of deception, in the means of blinding one's adversary, and ensnaring him by sophistical subtleties and quibbles. They required a large fee, which was paid beforehand. In later times, the Grecian and Latin rhetoricians were paid by the Roman emperors (first under Vespasian). The rhetoricians also wrote speeches for others. Antiphon was the first who composed forensic speeches for the use of others. With an oration of Lysias Iphicrates very often gained the advantage over his adversary. Anytus, by a speech prepared for him by the sophist Polycrates, obtained the condemnation of Socrates, who disdained to use one written for him by Lysias. Dinarchus became rich by composing orations for others. The prices paid for them were high, and many writers obtained so much celebrity as to be constantly occupied in this way. At length this traffic fell into merited contempt, and many great men avoided leaving written speeches, from fear of being reproached as sophists.

RHEUMATISM; a disease attended with sharp pains, which has so much resemblance to the gout, that some physicians have considered it as not an entirely distinct disease; although they are by no means to be confounded. (See *Gout.*) Rheumatism is distinguished into *acute* and *chronic*. The former is of short continuance, and either shifting to different parts of the body or confined to a particular part: in the latter case, it has a tendency to pass into the chronic, unless properly attended to: it is often attended with fever, or sometimes comes on in the train of a fever. This combination of rheumatism with fever is called *rheumatic* fever, which is considered by physicians a distinct species. Chronic rheumatism is attended with pains in the head, shoulders, knees, and other large joints, which, at times, are confined to one particular part, and at others shift from one joint to another, without occasioning any fever; and in this manner the complaint continues often for a considerable time, and at length goes off. No danger is attendant on chronic rheumatism; but a person having been once attacked with it, is ever afterwards more or less liable to returns of it. Neither is the acute rheumatism frequently accompanied with much danger. The acute is proceeded by shivering, heat, thirst, and frequent pulse; after which the pain commences, and soon fixes on the joints. The chronic rheumatism is distinguished by pain in the joints, without fever, and is divided into three species; *lumbago*, affecting the loins; *sciatica*, affecting the hip; and *arthrodynia*, or pains in the joints. The acute rheumatism mostly terminates in one of these species. Rheumatism may arise at all times of the year, when there are frequent vicissitudes of the weather from heat to cold, but the spring and autumn are the seasons in which it is most prevalent; and it attacks persons of all ages; but very young people are less subject to it than adults. Obstructed perspiration, occasioned either by wearing wet clothes, lying in damp linen, or damp rooms, or by being exposed to cool air when the body has been much heated by exercise, is the cause which usually produces rheumatism. Those who are much afflicted with this complaint, are very apt to be sensible of the approach of wet weather, by finding wandering pains about them at that period. Rheumatism usually attacks only the external muscular parts, but has sometimes been known to affect the internal parts, especially the serous membranes, the *pleura*, the *peritonæum*, the *dura mater*.

RHIGAS, CONSTANTINE, the Tyrtæus of modern Greece, the first mover of the war for Grecian independence, was born about 1753, at Velestini, a small city of Thessaly, and was early distinguished for talent. As he was not rich enough to devote himself to literature, he engaged in commerce, went to Bucharest, and remained there until 1790. He made himself intimately acquainted with the literature of ancient Greece. Latin, French, Italian and German were familiar to him: he wrote Greek and French, and was a poet and a proficient in music. He formed the bold plan of freeing Greece from the Ottoman Porte by means of a great secret association, and succeeded even in bringing powerful Turks into his conspiracy; among others, the celebrated Passwan Oglou. He then went to Vienna, where many rich merchants and some learned men of his nation resided. From this place he held a secret correspondence with the most important confederates in Greece, and in other parts of Europe. At the same time, he published a Greek journal, translated the Travels of the Younger Anacharsis, and wrote a treatise upon tactics. His patriotic songs, in his native language, were calculated to inflame the imagination of the Greek youth, and to embitter them against the Mussulmans. He likewise prepared a map of all Greece, with the ancient and modern names of places, in twelve sheets, which was printed at the expense of his countrymen in Vienna. He perished at the age of forty-five, having been arrested in Trieste. The signatures of all the confederates were contained in a document which he always carried about with him. This he destroyed in the night, and swallowed the names of his countrymen. With several other prisoners he was conducted to Vienna. Rhigas and three others of those arrested were sent back in chains to Belgrade, in May, 1798, and, according to some accounts, beheaded, and cast into the Danube. According to other accounts, Rhigas was sawed asunder between two boards.

RHINE (in German, *Rhein*; in Dutch, *Rhyn*, or *Ryn*); in magnitude the fourth river of Europe, and one of the noblest rivers in the world. There are rivers whose course is longer, and whose volume of water is greater, but none which unites almost every thing that can render an earthly object magnificent and charming, in the same degree as the Rhine. As it flows down from the distant ridges of the Alps, through fertile regions into the open sea, so it comes down from remote antiquity, associated in every age with momentous events in the history of the neighbouring nations. A river which presents so many historical recollections of Roman conquests and defeats, of the chivalric exploits of the feudal period, of the wars and negotiations of modern times, of the coronations of emperors whose bones repose by its side; on whose borders stand the two grandest monuments of the noble architecture of the middle ages; whose banks present every variety of wild and picturesque rocks, thick forests, fertile plains, vineyards sometimes gently sloping, sometimes perched among lofty crags, where industry has won a domain among the fortresses of nature; whose banks are ornamented with populous cities, flourishing towns and villages, castles and ruins, with which a thousand legends are connected, beautiful and romantic roads, and salutary mineral springs; a river whose waters offer choice fish, as its banks offer the choicest wines; which, in its course of 900 miles, affords 630 miles of uninterrupted navigation, from Basle to the sea, and enables the inhabitants of its banks to exchange the rich and various products of its shores; whose cities, famous for commerce, science, and works of strength, which furnish protection to Germany, are also famous as the seats of Roman colonies, and of ecclesiastical councils, and are associated with many of the most important events recorded in history; —such a river it is not surprising that the Germans regard with a kind of reverence, and frequently call in poetry *father Rhine*, or *king Rhine*. (See Byron's verses on the Rhine, in *Childe Harold*, canto iii, stanzas 55—61.)

Since the French revolution, the Rhine has been frequently called in France the natural boundary between France and Germany; with equal reason the Elbe might be called so, and perhaps would have been called so, had the French empire continued, as it had extended already to that river at one point.* The Rhine rises in the Swiss canton of the Grisons, from three chief sources. The first comes from the mountain called Crispalt, north-east of the St Gothard, and unites at Dissentis with the second, which comes from the Lucmanian mountain: both unite with the third, which comes from a glacier in the mountain of Adula, about twenty leagues distant from Reichenau, the point of confluence of all three. The river here takes the name of *Rhine*, and is 230 feet wide. It passes through the Bodensee (lake of Constance, q. v.). From Reichenau to Basle it is navigable at intervals, sometimes only by rafts. Before it falls into the lake of Constance, it forms the cataract of Schaffhausen, in the canton of Zurich, where the river is closely compressed by rocks and falls with great fury eighty feet. After having traversed or touched several cantons of Switzerland, also Austria, Baden, France, Bavaria, Hessia, Nassau, Prussia, and the Netherlands, it divides into several branches. Hardly has it entered Holland (at Emmerich), when it sends off to the left a considerable branch, the Waal, which joins the Meuse at Woudrichem. Somewhat lower down, a little above Arnheim, on the right, a branch is formed which occupies the bed of a canal constructed by Drusus; this is the New-Yssel, which, after having joined the Old-Yssel, at Doesburg, takes the name of Yssel, or Over-Yssel, and empties into the Zuyder-Zee. Arrived at Wyk-by-Duurstede, twenty-seven miles east of Arnheim, the Rhine divides into two branches; one of which, the chief continuation of the river, is called Lech, and joins the Meuse: it forms on its right the Neder-Yssel, which also joins the Meuse; the other branch, formerly the most considerable, but now small, is now called the Crooked Rhine (*Kromme-Rhyn*), and takes its course to Utrecht, where again it splits: the north-west branch is called Vecht, and empties into the Zuyder-Zee; the other western branch, called Old Rhine (*Oude-Rhyn*) empties into the North sea, two leagues from Leyden. It formerly disappeared in the downs of Katwyk, formed in 860; but it has been conducted by a canal from Leyden to the sea. The most important rivers which flow into it are, the Aar, Kinzig, Murg, Neckar, Maine, Nahe, Lahn, Moselle, Erft, Ruhr, Lippe: the most important places on the banks are Constance, Schaffhausen, Basle, Spire, Manheim, Worms, Mentz, Bingen, Coblentz, Bonn, Cologne, Dusseldorf, Wesel, Emmerich, Arnheim, Utrecht, Leyden. The whole basin of the Rhine is about 180 leagues long, and 100 leagues wide, where it is the widest, and comprises about 10,000 square leagues. The canal of the Rhone and Rhine unites these two rivers by means of the Saone; the great canal of the North uniting the Rhine with the Meuse and the Nethe, and thus with the Scheldt. In the article *Danube*, we have spoken of the projected canal which was to unite the Danube and the Rhine, the Black sea, and the Northern ocean.

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* Rivers are, generally speaking, poor means of political separation, because they are, in fact, means of connexion rather than of separation. Mountains and languages furnish far more effectual lines of demarcation. The only reason why rivers have often been taken as frontiers, is, because they are lines drawn by nature, which can be easily designated in treaties.

The Rhine furnishes excellent salmon (called *Lachse* when they ascend the river in spring, coming from the sea, and *Salmen* when they descend in autumn to the sea), sturgeons, lampreys, pikes, and excellent carps.

From Strasburg to Spire the Rhine is about 1100 feet wide; at some parts of the Rheingau, it is 1800; at Cologne, 1300. At Schenkenschanz, where it enters the Netherlands, it is 2150 feet wide. Its depth from Basle to Strasburg is between ten and twelve feet; at Mentz, twenty-four; at Dusseldorf, fifty. When the snow melts in Switzerland, the Rhine rises from twelve to thirteen feet above its common level. The mean descent of the river is about seven feet a mile; its current runs about 288 feet in a minute, or about three and a third miles per hour. Vessels of from 300 to 450 tons go up the river to Cologne, those of 12 to 200 to Mentz, those of 100 to 125 to Strasburg. Steam-boats and "water-diligences" render communication easy. The congress of Vienna, in 1815, declared the navigation of all the German rivers free; but this ordinance has not been carried into effect as regards the Danube, and it was not till after fifteen years' negotiation between the various powers, and after 563 protocols had been drawn up on the subject, that the navigation of the Rhine was made free, in the year 1831.

Three books contain every thing necessary for a journey along the Rhine: one, by Lange, comprehends the journey from Mentz to Dusseldorf, the most romantic part south of Basle; another, by Aloys Schreiber, comprehends the whole course of the Rhine, with excursions into neighbouring parts; the third is by Ch. A. Fischer—Newest Guide from Mayence to Cologne (Frankfort, 1827). There exist excellent representations of the scenery of the Rhine, semi-perspective and semi-topographic, very ingenious productions, which afford the traveller the highest gratification. See, also, the *Panorama of the Rhine, from Mayence to Cologne*, by Delkeskamp (Dresd. and Frankf., 1825, in eighty engravings), also Primavesi's *Course of the Rhine from its Sources to its Mouth, drawn from Nature* (1818), and Historico-Statistical Panorama of the Rhine, from Bingen to Coblentz, by Dahl (Heidelberg, 1820). Aloys Schreiber's book contains a catalogue of all the works on the Rhine, or relating to it.

RHINE; one of the eight circles of Bavaria, commonly called *Rheinbaiern*, separated from the rest of the kingdom, on the left bank of the Rhine. It is chiefly composed of the former French department Mont-Tonnere. The Mont-Tonnere, 2100 feet high, is the summit of the Vosges, which traverse the circle. Inhabitants, 517,081; square miles, about 3000.

RHINE, DEPARTMENTS OF THE UPPER AND LOWER. See *Department*.

RHINE, CONFEDERATION OF. See *Confederation of the Rhine*.

RHINE, LOWER, (in German, *Niederrhein*), a Prussian province, with the title of grand-duchy, formed by the congress of Vienna, in 1815, containing 1,127,297 inhabitants and 6100 square miles, embraces both banks of the Rhine, and is bounded by the Prussian provinces of Juliers-Cleves-Berg and Westphalia, by Nassau, Hesse-Darmstadt, France, the Netherlands, and several smaller territories. The Hundsruck (q. v.) traverses the province of the Lower Rhine between the rivers Nahe and Moselle, and joins the Vosges. The Eifel and the High Veen are ridges of hills coming from the Ardennes. The province furnishes game, fish, grain, fruits, flax, hemp, wine, wood, silver, iron, copper, lead, calamine, marble, slate, sand and mill stones, basalt, tufa, porphyry, alum, sulphur, coals, and mineral waters. In some parts much manufacturing industry exists. Much cloth is made in and near Aix-la-Chapelle. The other manufactures are linen, silks, leather, iron and steel wares. The inhabitants are mostly Catholics; in the southern part French is spoken in some places. The province is divided into three governments—Aix-la-Chapelle, Treves, and Coblentz. Aix-la-Chapelle is the chief place. The province comprehends the chief part of the ancient archbishopric of Treves, the abbeys of Prum, Cornely-Munster, Malmedy, part of the old archbishopric of Cologne, of the duchy of Luxemburg and Juliers, &c.

RHINOCEROS. This is a large animal, belonging to the order of *pachydermata*, having each foot divided into three toes, and furnished with one or more horns on the snout. There are several species, the best known of which are the Indian, or one-horned, and the African, or two-horned.

One horned rhinoceros. This species is a native of India, particularly of that part beyond the Ganges. It is a clumsy and deformed looking animal: a single black horn, placed near the end of the nose, makes its specific character. The upper lip is very large, and overhangs the lower: it is furnished with strong muscles, and is employed by the animal somewhat as the elephant uses his trunk. The ears are large, erect, and pointed. The skin is naked, rough, and extremely thick; about the neck it is gathered into large folds; a fold also extends between the shoulders and fore legs, and another from the hinder part of the back to the thighs. The tail is slender, flat at the end, and furnished at the sides with very stiff, black hairs. The legs are very short. This animal was well known to the ancients, and was introduced into the games of the circus by Pompey; in all probability it is the *reem* (unicorn) of the Bible. From the time of the fall of the Roman empire, however, it was lost sight of so completely, that, prior to the sixteenth century, naturalists were of opinion that it had never existed, or, if so, that it was extinct. When the Portuguese, however, doubled the cape of Good Hope, and opened the way to India, these animals again became known, and many were introduced into Europe. The first that appeared in England was in 1684. The rhinoceros lives in shady forests adjoining rivers, or in the swampy jungles with which its native country abounds. Though possessed of great strength, and more than a match for either the tiger or the elephant, it is quiet and inoffensive unless provoked. The female produces one at a birth. The growth of the young is very gradual, as, at the age of two years, it scarcely attains half its height. The sight of the rhinoceros is by no means acute, but, on the contrary, its senses of smelling and hearing are very vivid. Its chief food is canes and shrubs. It was for a long time supposed that the tongue was hard and exceedingly rough; but recent observations have shown that it does not present these peculiarities. The flesh somewhat resembles pork in taste, though of a coarser grain and stronger taste.

Two-horned rhinoceros. This species is a native of Africa, and resembles the preceding in many particulars, but differs in being provided with an additional horn, of a smaller size, situated nearer the forehead; the skin also is not thrown into the folds, so remarkable in the Indian species; at least, this is the account given by Sparrman, whilst Bruce represents it as having them. The two-horned rhinoceros was better known to the ancients than the last-mentioned kind, and is represented on many of their coins, especially those of Domitian. The rhinoceros is greatly inferior to the elephant in docility, and has never been made sociable to man. The skin is used for whips and walking-canes, and of the horns drinking cups were made, which were highly esteemed by the East Indians, as they imagined that if poison were put into them, the liquor would ferment till it ran out of the vessel. Martial informs us, that Roman ladies used these horns as cases to hold their essence bottles and oils. The skin of the rhinoceros is also used by the Javanese for shields.

RHINOPLASTIC (from *ῥιν*, the nose, and *πλαστικη*, the art of forming). The art of restoring the nose, when lost by disease or external injury, was early practised in India by the Bramins, and is even now practised by the descendants of this caste, the Coomas, by means of a piece of skin cut from the forehead. In 1442, Branca, a Sicilian physician, operated by means of a piece of skin cut from the arm of the individual; and after him, this method was preserved in the family of the Bajani as a secret, until Caspar Tagliacozzi (born in 1546, died in 1599) practised it in Bologna, and made it public in 1597. He pursued the method of taking the skin from the arm. This method was last practised by Molinetti, in the beginning of the seventeenth century. In 1816, Grafe, a German physician, attempted the formation of the nose from the skin of the arm upon a young soldier who had lost his nose by a sabre cut. The method differed but little from that of Tagliacozzi. See Grafe's *Rhinoplastic* (Berlin, 1818, quarto).

RHODE ISLAND, one of the United States of America, includes what was formerly known by the name of *Rhode Island and Providence Plantations*; it originally consisted of two plantations, or provinces. This state is bounded north and east by Massachusetts, south by the Atlantic ocean, and west by Connecticut; length, forty-nine miles; breadth, twenty-nine; square miles, 1350; population in 1810, 76,931; in 1820, 83,059, including forty-eight slaves; in 1830, 97,212, including fourteen slaves; lat. 41° 22′ to 42° 3′ N.; lon. 71° 6′ to 71° 38′ W. In the north-west part of the state, the country is hilly and rocky, but in other parts it is mostly level. The soil is better adapted to grazing than tillage, except on the island of Rhode Island, which has an excellent soil, adapted to the growth of every thing that is suited to its climate. A considerable part of the state has a thin soil, and affords small crops of New England productions; but the country near Narraganset bay is generally very fertile. Great numbers of cattle and sheep are produced on the islands, and on the margin of the bay; and butter and cheese, cider, many kinds of fruit, corn, rye, barley, and oats are produced in abundance. The rivers and bays afford a great variety of excellent fish. Iron in abundance, small quantities of copper, limestone, and a mine of anthracite, are the minerals and fossils that have hitherto been found. The rivers are the Pawtucket, Providence, and Pawtuxet. Narraganset bay extends from south to north through nearly the whole length of the state, and embosoms Rhode Island, Connecticut, Prudence, Patience, Hope, Dyer's, and Hog islands. Block island, in the Atlantic, south of the state is the most southerly land belonging to it. The exports of Rhode island consist principally of flax-seed, lumber, horses, cattle, beef, pork, fish, poultry, and cotton and linen goods. Its manufactures have greatly increased within the last ten years, and add greatly to its wealth. The value of its exports of domestic produce, during the year ending September, 30, 1829, was 337,468 dollars. Its tonnage in 1828 was 43,406. Since these periods, the commerce of the state has rapidly increased. The commercial and manufacturing interests of Rhode island are principally centred in Providence. This has become one of the most important cities of New England, and contains now about one-fifth of the population of the state. Newport is somewhat less than half the size of Providence, and the other towns are not large. The general assembly of Rhode Island meets four times in a year: at Newport on the first Wednesday of May, which is the commencement of the political year, and again at the same place in June; in October, it meets alternately at Providence and South Kingston; and in January at East Greenwich, Bristol, or Providence. Brown university is situated at Providence. At the same place there is a seminary styled the *Friends' boarding-school*, and there are eight or ten academies in the state. (See *Providence*.) The state now pays 10,000 dollars annually for the support of free schools; and this sum is divided among the several towns, according to their population. This, however, affords but imperfect means for the education of the poorer classes of society. In 1831, the Baptists in Rhode Island had sixteen churches, twelve ministers, 2600 communicants; the Methodists ten preachers, 1,100 members; the Congregationalists ten churches, ten ministers, 1000 communicants; the Unitarians two societies, two ministers; the Sabbatarians about 1000 communicants; the Six-Principle Baptists about eight churches, and 800 communicants. There are many Friends, and some of other denominations. The settlement of Rhode Island was commenced at Providence, in 1636, by the celebrated Roger Williams, a minister, who was banished from Massachusetts on account of his religious opinions. (For further information respecting the history, see *Providence*, and *New England*).

RHODE ISLAND; an island situated in Narraganset bay; lat. 41° 25′ N.; lon. 71° 20′ W. The state of Rhode Island takes its name from this island. It is about fifteen miles from north to south, and three and a half wide, and is divided into three townships, Newport, Portsmouth, and Middletown. It is a noted resort for invalids from southern climates. The island is very fertile, pleasant, and healthful; and many travellers call it the *Eden of America*. It suffered greatly by the war of the revolution, but has been, in a considerable degree, restored to its former beauty and value. About 40,000 sheep are fed on the island, besides neat cattle and horses. There is a coal-mine on the north part of the island, but the coal is not, at present, much esteemed.

RHODES (Ῥόδος, from ῥόδον, a rose, or from ῥόθος, noise of waters); an island in the Grecian archipelago, lying between Crete (Candia) and Cyprus, ten miles from the southern coast of Asia Minor; thirty-six miles in length, and fourteen in breadth; 450 square miles. Rhodes, was, in ancient times, sacred to the sun, and was celebrated for its serene sky, its soft climate, fertile soil, and fine fruits. The republic of Rhodes was an important naval power, and planted colonies in Sicily, Italy, and Spain. The beauty and size of its works of art were admired in all Greece, and it was much visited by the Romans on account of them. The commercial laws of the Rhodians were adopted, as the basis of marine law, on all the coasts of the Mediterranean, and some fragments of them still retain their authority. (See *Commercial Law*.) This rich and powerful republic took an important part in several of the Roman wars, and was first made a Roman province in the reign of Vespasian. In 1309, after the loss of Palestine, the knights of St John occupied the island, and were thence called the *Knights of Rhodes*. In 1480, they repelled an attack of the Turks, but, in 1522, were obliged to surrender the island to Soliman II. (See *John, Knights of St*). The population is differently estimated, by Savary at 36,500, of which about one third are Greeks, with an archbishop. The island is governed by a pacha, who is under the capudan pacha or high-admiral and governor of the islands of the Archipelago. The revenue of the sultan from the island is estimated at 90,000 piasters. The productions are corn, wine, oil, cotton, fruits, wax, honey, &c. The capital, Rhodes (lon. 28° 12′ E.; lat. 36° 26′ N.), has a population of 6000 Turks. The suburb Neachorio is inhabited by 3000 Greeks, who are not permitted to reside within the city. The town is surrounded by three walls and a double ditch, and is considered by the Turks as impregnable. It has two fine harbours, separated only by a mole. The celebrated colossus probably stood here. See *Colossus*.

RHODIUM; a new metal, discovered among the grains of crude platina by doctor Wollaston. Its specific gravity is 11. It readily alloys with every other metal, except mercury. One sixth of it does not perceptibly alter the appearance of gold, but only renders it more fusible. When pure, it is brittle, and requires a much higher temperature for its fusion than any other metal, unless it be iridium. It is insoluble in all acids. Doctor Wollaston made silver pens, tipped with rhodium, which, from its great hardness, were not liable to be injured by use.

RHODODENDRON MAXIMUM, or DWARF ROSE BAY; one of the most ornamental shrubs of North America. It is generally about ten feet high, but sometimes reaches to twenty or twenty-five, with a trunk four or five inches in diameter. The leaves are large, oval, oblong, coriaceous, smooth, and shining; the flowers large, rose-coloured, with yellow dots on the inside, and are disposed in an elegant terminal cluster. It is most abundant about the Alleghany mountains, where it sometimes forms impenetrable thickets, presenting a magnificent appearance when in flower. The wood is hard, compact, and fine-grained, but inferior, in these respects, to that of the mountain-laurel, and has not hitherto been applied to any useful purposes. Two other species of rhododendron inhabit the more southern parts of the Alleghanies. The species of rhododendron are shrubs, with alternate, entire, evergreen leaves, and ornamental flowers, usually disposed in terminal corymbs. About eighteen species are known, which inhabit the cold and temperate parts of the northern hemisphere, and especially mountainous districts. One, the *R. Lapponicum*, grows as far north as civilized man has penetrated, and, in common with other arctic plants, is found, within the United States, only on the summits of the White mountains of New Hampshire. An Oriental species, sometimes seen in our green-houses, resembling the *R. maximum*, but with brilliant scarlet flowers, hardly yields in magnificence to any production of the vegetable creation. All the species are cultivated in gardens on account of the beauty of their flowers.

RHONE (Rhodanus); a great river in the south of Europe, which rises in the central and highest part of Switzerland, at the foot of mount Furca, only five miles from the source of the Rhine. It flows in a western direction through a long and wide valley of the Swiss canton of the Valais, and, being swelled by a number of mountain streams, it passes through the lake of Geneva. Flowing southward, and being joined by the Saône and other streams, such as the Isère, the Drome, the Ardeche, and the Durance, it discharges itself, after a course of nearly 500 miles, by three mouths, into the part of the Mediterranean called the gulf of Lyons, where its branches form the island of Camargue. The principal cities on the Rhone are Geneva, Lyons, Vienne, Avignon, Beaucaire, and Arles. It is the most rapid river of Europe. The navigation down the stream is easy, but the upward can be performed only by draught or steam. (See *Canals*.) It carries down large quantities of earth, which it deposits at its mouth. Below Lecluse, the river plunges, with great noise, into a cavity of the rocks, and disappears for the distance of sixty paces. Several miles below this place, at a point called Malpertuis, it again almost entirely disappears under the rocks.

RHOENGEBIRGE; a range of mountains in Germany, extending from Kaltennordheim to beyond Bischofsheim, about thirty miles in length; it traverses the north-west of Bavaria, and part of Hesse Cassel, approaching the Thuringian forest on the north, and the Spessart towards the south. The highest summit is the Kreutzberg, 2800 feet high.

RHUBARB (*rheum*); a genus of plants, mostly inhabiting the interior of Asia. It belongs to the family *polygoneæ*, together with the docks, which it somewhat resembles. It is one of the few genera which have nine stamens, the *enneandria* of Linnæus. The roots and leaves are remarkably large, and the flowers inconspicuous, but disposed in very ample panicles. The seeds are provided, at the angles, with a membranous wing. The roots of all are mildly purgative, combined with tonic and strengthening properties; that of the officinal rhubarb (*R. palmatum*) is considered the most efficacious, but there is no great difference in this respect. The officinal or true rhubarb grows wild along the frontiers of China, near the great wall, upon a chain of mountains which stretches from the Chinese town Sini to lake Kokonor, near Thibet. It is easily distinguished by having the leaves divided into acute lobes; the roots are very large, yellow, and branching; the stem is of moderate height, cylindrical, smooth, and striated, provided at base with a great number of large, petiolate leaves; these are divided into five or seven lanceolate, acute segments, each of which is again subdivided, and are green and rough above, a little whitish and pubescent beneath, and traversed with large yellowish nerves; their leaf-stalks are very long, and grooved; the flowers are small, yellowish-white, and are disposed in numerous upright panicles; the seeds are blackish-brown, and triangular. It is usual with the Chinese, when the roots have been taken from the ground, cleaned, and pared, to cut them in slices and lay them upon long tables, taking care to turn them three or four times a day, experience having taught that if exposed to a free current of air, they become light, and lose a portion of their strength. After the fourth day, they are perforated and strung upon cords, in such a way as not to touch each other, and are suspended to dry in the shade, either upon trees or in tents. In about two months, the roots have lost seven eighths of their weight, and are fit for market. Winter is the proper season for taking up the roots. Formerly rhubarb was brought from China, through Tartary, to Ormutz and Aleppo, thence to Alexandria, and even to Vienna. This was called *Turkey* rhubarb. Now it is brought by sea from Canton and Ormus. All the rhubarb of commerce is obtained from the chain of mountains above mentioned.

It is only within a few years that the officinal rhubarb has been successfully cultivated on a large scale in Europe. It is most readily multiplied by planting pieces of the root containing eyes, thirty or more of which are afforded by a root four or five years old: half an inch of the root is sufficient to ensure the shooting of these eyes. They are planted a little before the opening of the spring, after leaving them exposed to the air for a day, in order that cicatrices may be formed: they should be placed in quincunx order, about six feet apart, as the leaves occupy a very great space; but as, for the two first years, they do not fill this space, some other crop may be raised between them. It is an injudicious practice to cut away the leaves, and hinders the growth of the roots; but to cut or break the stems, about a foot from the ground, is very often advantageous. The plant may remain in the ground all winter, but during severe frosts should be covered with straw or dry leaves. A deep soil, and one where sand does not predominate, seems best adapted to its culture; but it succeeds in every soil that is not arid or watery; neither does it fear shade or a northern exposure; in dry weather, watering is advantageous, but long rains are very injurious. The roots are taken from the ground only after the fourth or fifth year, but sooner in a dry and warm soil than in a moist and cool one; when taken up too soon, their substance is soft, and will lose eleven twelfths of its weight in drying; on the other hand, if left too long in the earth, the roots become hollow, or even rot in the centre. The time for removing them is in the autumn, after the leaves are perfectly dry. The stocks live ten or twelve years in a good soil, and only half as long in one which is less adapted to them. The rhubarb of commerce is brownish-yellow externally, saffron-yellow within, and variegated with white and reddish streaks. The odour is disagreeable, and the taste bitter, astringent, slightly acrid, and nauseous. Its properties are, at the same time, tonic and purgative. It is administered in powder, in mixtures, or formed into pills, or the root may be chewed in substance. The value of the annual import of this article into Great Britain is said to exceed £225,000. The bark of rhubarb has been used for tinctures, and is found, in every respect, as efficacious as the best part of the roots, and the seeds possess nearly the same qualities. The leaves impart an agreeable acidity, somewhat similar to that of sorrel; and a marmalade is made from the fresh stalks, by stripping off the bark, and boiling the pulp with an equal quantity of sugar.

The common garden rhubarb (*R. rhaponticum*) has obtuse, smooth leaves, with hairy veins beneath. It was first brought into Europe about the year 1610, and is chiefly in request for the stalks of the leaves, which, when young, are used for pies and tarts. The root has occasionally been sold for the rhubarb of commerce, and for a long time was supposed to be identical with it. The *rheum ribes* is remarkable for having the seeds enveloped in a succulent and reddish pulp. It grows on the mountains of Syria and Persia, and is, besides, cultivated on an extensive scale in those countries, on account of the agreeably acid flavour of the leaves, leaf-stalks, and young stems. These are sold constantly in the markets, and are eaten either in a crude state, with salt or vinegar, or are preserved in wine, or with sugar.

RHUMB, in navigation; a verticle circle of any given place, or the intersection of such a circle with the horizon; in which last sense *rhumb* is the same as a point of the compass.

Rhumb-line; a line prolonged from any point of the compass, on a nautical chart, except from the four cardinal points.

RHUNKEN. See *Ruhnkenius*.

RHUS. See *Sumac*.

RHYME, in poetry; the correspondence of sounds in the terminating words or syllables of verses. The vowel and the final articulations or consonants should be the same, or nearly the same, in sound. The initial consonants may be different. Languages which have not, like the English, a great variety of shades between the Italian sounds of *a*, *e*, *i*, *o*, *u*, admit only pure rhymes; that is to say, the corresponding syllables must have exactly the same vowel sound. English verse is much less restrained; and we find in the best English poets rhymes which strike a foreign ear as very impure. In some instances, such as *sky* and *liberty*, *hand* and *command*, *gone* and *alone*, the correspondence in the letters makes what might be called a rhyme to the eye, which supplies, in some measure, the want of correspondence in sound. In other instances, however, this is not the case, as in *revenge* and *change*, *remote* and *thought;* and the liberty of making rhymes of syllables corresponding in sound, though different in spelling, is greater in English than in most other languages; as *water* and *mortar*, *warm* and *storm*. If the rhyme is only in the last syllables, as in *forgave* and *behave*, it is called a *male* rhyme; if in the two last syllables, as *bitter* and *glitter*, it is called a *female* rhyme. Sometimes the last three syllables rhyme, as *callosity* and *reciprocity*, or the Italian *diacine* and *duracine*, or *tavola* and *favola* (the *verso sdrucciolo*). This last sort of rhymes is principally used in pieces of a comic or conversational character. Rhymes which extend to more than three syllables, are almost confined to the Arabians and Persians in their short odes (*gazelles*), in which the same rhyme, carried through the whole poem, extends sometimes to four and more syllables. Some languages incline more to the male rhyme, as the English, on account of its superabundance of monosyllables; others, as the Spanish and Italian, more to the female: the German and French possess an almost equal store of both; hence in these two languages we find them generally interchanged regularly; yet there are numerous poems in these languages, written exclusively in male or female rhymes. Of the four continental idioms just mentioned, the German, from its abundance of consonants, has the greatest variety of final syllables, and therefore the smallest collection of rhymes for any given termination. It has, however, to compensate for this deficiency, a regular prosody, arising from the possession of long and short syllables.

The modern use of rhyme was not known to the ancients. We meet, indeed, with some rhymed verses in Ovid, in which the rhyme was evidently intentional; but the object was not to distinguish the verses, but to give impressiveness to the sense, as Shakspeare often introduces a rhymed couplet, for the same purpose, in blank verse. In the Latin poems of the fathers of the church of the fourth century, rhymes are more frequently used. The rhyme is harmony, music, and therefore is addressed directly to the feelings, and thus partakes essentially of the character of modern art, whilst the metrical forms of antiquity are in the spirit of that plastic age. (See *Classic*, *Plastic*, and *Romantic*.) The Goths introduced rhyme from the East into the northern languages. The most ancient relics of Scandinavian poetry are not in rhyme, but are distinguished by alliteration. These circumstances gave rise to the opinion that rhyme originated with the Arabians, who came into contact with the Europeans of the south as early as the eight century. Schlegel, in his *Observations sur la Littérature Provençale*, however, denies this. Joseph von Hammer, on the other hand, is a decided believer in the influence of the Arabians on the provençal poetry in respect to the structure of rhymed couplets and the forms of rhyme in the southern poetry; which seems undeniable, though it is not necessary to derive rhyme itself from the Arabians. The oldest forms of rhymed verse are the couplet and the continuation of one and the same rhyme through a whole piece. The Troubadours first attempted a variety of artificial combinations of rhyme in the sonnet, canzone, &c., and the Spaniards and Italians, with their rich languages and delicacy of ear, perfected the forms of involved rhyme. The Italians, however, at a later period, carried the artificial intricacies of rhyme to great excess. Rhyme, well managed, is one of the most pleasing of all inventions for entertaining the mind, constantly raising expectation, and as often satisfying it. The ear anticipates the sound, without knowing what the sound will express; and how various are the forms of grace and majesty of which it is susceptible! Yet it has misled many persons to think they were composing poetry, whilst they were only rhyming; and were it not for rhyme, we might have been saved from a flood of insipid verse, which has so long overspread the field of literature. See *Sonnet*.

RHYTHM, in general, means a measured division of time. The rhythm, in dancing, is made manifest to the eyes by steps, and, in music and language, to the ears by tones. (See the beginning of the article *Dancing*.) We must refer the fondness for rhythm, in the human mind, to its love of order, harmony, symmetry, which lies at the base of all the arts. As song, music and dancing spring from the same sources, and, in the earliest periods of nations, are actually united, the rhythm of all three has much in common. The rhythm of poetry is susceptible of the same exact division of time as the rhythm of dancing and music; but oratorical rhythm is satisfied with a pleasing cadence of syllables—an approximation to the rhythm of verse, particularly at the beginning and end of periods. The orator or eloquent prose writer arranges his words in an expressive and pleasing succession, but he does not follow precise rules, like the versifier. The poetical rhythm, like every species of rhythm, requires a succession of motions of regular duration, which, variously interrupted, must yet be obvious, and combined according to the rules of beauty and grace, so as to form a harmonious whole. In order to make rhythm please, its constituent parts must excite the feeling of variety and harmony or unity. The various parts must form a whole, and exhibit a beginning, middle and end, by a measured rise and fall. Those parts which receive the *ictus*, the stress of the rhythm, are called *arsis* (elevation), the other parts *thesis* (position, depression). To denote the arsis, the common acute accent is used (´), e. g.

Singula quǽque locúm teneánt sortita decénter.

The arsis must by no means be confounded with the long syllable, nor the thesis with the short syllable. As the short syllable is the smallest constituent part of a verse, it is considered as the original unit for the measure of time in the rhythm, and is called a *time*, or *mora*. The absolute duration of this unit depends upon the quickness or slowness with which the rhythmical composition is uttered. The smallest rhythmical magnitude is the foot, by which every union of arsis and thesis is understood. A single word may constitute a foot, or the beginning and end of the foot may be in the middle of words, as in the following verse:

Contém-nit, ár-tibús-que ví-vit dé-ditúm turpís-simus

Rhythm can be imagined without words, and may be indicated by notes, or other signs of long and short syllables. Hence the rhythm may also be divided differently from the words, as we have just seen; and the division of the words should not agree with the rhythmical feet, except where a rhythmical series is concluded, or the pausing of a part of the same requires a break in the text. In all other cases, the divisions of the rhythm ought to separate the parts of words as much as possible, which is called *cæsura*. (q. v.) The Greeks distinguished the feet according to the number of units of time contained in them. The Romans divided them, according to the number of syllables, into four of two syllables, eight of three syllables, and sixteen of four syllables, and called them, with the Greeks, thus:

1. *Feet of two Syllables.*

⏑ ⏑ Pyrrhichius.
– – Spondeus.
– ⏑ Chorēus, or Trochæus.
⏑ – Iambus.

2. *Feet of three Syllables.*

⏑ ⏑ ⏑ Tribrachys.
– – – Molossus.
– ⏑ ⏑ Dactylus.
⏑ ⏑ – Anapæstus.
⏑ – ⏑ Amphibrăchys.
– ⏑ – Amphimăcer.
⏑ – – Bacchēus.
– – ⏑ Palimbacchēus, or Antibacchēus.

3. *Feet of four Syllables.*

⏑ ⏑ ⏑ ⏑ Proceleusmaticus (Dipyrrhichius.)
– – – – Dispondēus.
– ⏑ – ⏑ Dichorēus, or Ditrochæus.
⏑ – ⏑ – Dijambus.
– ⏑ ⏑ – Choriambus.
⏑ – – ⏑ Antispastus.
⏑ ⏑ – – Ionicus a minore.
– – ⏑ ⏑ Ionicus a majore.
– ⏑ ⏑ ⏑ Pæon primus.
⏑ – ⏑ ⏑ Pæon secundus.
⏑ ⏑ – ⏑ Pæon tertius.
⏑ ⏑ ⏑ – Pæon quartus.
⏑ – – – Epitritus primus.
– ⏑ – – Epitritus secundus.
– – ⏑ – Epitritus tertius.
– – – ⏑ Epitritus quartus.

These feet are simple or compound, redundant or retrenched. The first consist of but one arsis and thesis, as ⏑́ ⏑, ⏑́ ⏑ ⏑, ⏑́ ⏑ ⏑ ⏑, –́ ⏑, –́ ⏑ ⏑, &c. The second consist of two of each sort, of which one arsis and thesis, taken together, is considered as a single arsis or thesis, as ⏑ ⏑ –́ ⏑, –́ ⏑ –́ ⏑, ⏑ ⏑́ ⏑ –́, –́ –́ –́ –, or – –́ – –́. The third are such as contain, besides a simple foot, a short prefix or affix, or in which feet of unlike quantity are connected with each other, as ⏑ –́ ⏑, ⏑ –́ ⏑ ⏑ ⏑ ⏑ –́ ⏑; ⏑ –́ –́ –́, –́ ⏑ –́ ⏑ ⏑ –́ ⏑ –́, –́ – –́ ⏑. The fourth sort are feet which, with two arsises, have but one thesis, or have two arsises immediately succeeding each other without a thesis between, e. g. –́ ⏑ –́, –́ ⏑ ⏑ –́, –́ ⏑ –́ ⏑ or ⏑́ ⏑ ⏑ –́, –́ – –; –́ –́ ⏑, ⏑ –́ –́, –́ ⏑ –́ ⏑, ⏑ –́ –́ ⏑; –́ –́ ⏑ ⏑, ⏑ ⏑ –́ –́, –́ –́ –, – –́ –́. Of the simple feet, those only which have a long syllable in the arsis, and a short syllable in the thesis, afford natural variety, as –́ ⏑, –́ ⏑ ⏑, ⏑ –́, ⏑ ⏑ –́. The trochee and dactyle, therefore, the iambus and anapest, are considered as the fundamental feet of all rhythm, with which the other feet can be brought into connexion by resolving a long syllable into two short ones, or by contracting two short into one long. For more information, see *Verse*.

RIAL, REAL: a Spanish coin. (For the *real de plata* (silver rial), see *Coins*.) The *real de vellon* (copper rial) is equal to about two-pence farthing.

RIALTO. See *Venice*.

RIB. The ribs are long curved bones, placed in an oblique direction at the sides of the chest. Their number is generally twelve on each side; but, in some subjects, it has been found to be thirteen, and in others, though more rarely, only eleven. They are distinguished into *true* and *false* ribs. The seven upper ribs, which are articulated to the sternum, are called *true* ribs, and the five lower ones, which are not immediately attached to that bone, are called *false* ribs. The use of the ribs is to give form to the thorax, and to cover and defend the lungs; also to assist in breathing; for they are joined to the vertebræ by regular hinges, which allow of short motions, and to the sternum by cartilages, which yield to the motion of the ribs, and return again when the muscles cease to act. See *Respiration*.

RIBERA, Giuseppe. See *Spagnoletto*.

RICARDO, David, a celebrated writer on finance and statistics, was of a Jewish family, and was born in London in 1772. His father was a stock broker, and the son was intended for the same profession. His character for probity, industry and talent early procured him means of support; and, becoming a member of the stock exchange, he accumulated immense property. In 1810, he appeared as a writer in the Morning Chronicle, on the subject of the depreciation of the national currency; and he afterwards embodied his ideas in a distinct work, the reasonings of which were adopted in the Report of the Bullion Committee of the house of commons. He next published an Essay on Rent, in which he advocated the principles of Malthus concerning population. His most important production is his treatise on Political Economy and Taxation, which affords a luminous exposition of the origin and fluctuations of national wealth and expenditure. In 1819, Mr Ricardo obtained a seat in parliament for the Irish borough of Portarlington, and as a senator attracted the respect and esteem of all parties. He died in September, 1823. Mr Ricardo is said to have been a Unitarian, though he usually attended the service of the established church after renouncing Judaism.

RICCI, Lorenzo, the last general of the Jesuits previously to their suppression by pope Clement XIII., was born at Florence in 1703, entered the order at the age of fifteen, and, after having been professor of rhetoric and philosophy at Sienna, he became spiritual director at the Roman college, and secretary of his order. In 1758, he succeeded to the office of general on the death of Centurioni. Resisting the suppression of the Jesuits, he was sent to the castle of St Angelo, where he died in 1775. (See *Jesuits*.)—See his life, by Caraccioli.

RICCI, Scipio, bishop of Pistoia and Prato, nephew of the preceding, was born at Florence, in 1741. Being favoured by the grand-duke of Tuscany, Leopold, he opened, at Pistoia, in 1786, a synod, with a view to the propagation of some new religious doctrines; by which he incurred the displeasure of the pope, and was obliged to resign his see. In 1779, he was imprisoned for declaring in favour of the decrees of the constituent assembly, which had been formed under the influence of the French. Being set at liberty, he signed, in 1805, a formula of adhesion, to the bulls which he had objected to, and became reconciled to the holy see. He died in 1810. In 1824, appeared the *Vie et Mémoires de Scipion Ricci*, by M. de Potter (translated into English, by T. Roscoe, 2 vols., 1829).

RICCOBONI, Lodovico, born at Modena in 1677, manifested an early passion for the theatre; and, having become the director of a theatrical company at the age of twenty-two years he endeavoured to reform the Italian theatre, by substituting regular pieces for the miserable farces which then had possession of the stage in Italy. (See *Drama* and *Italian Theatre*.) Wearied with the opposition made to his efforts by the perverse taste of his countrymen, he went to Paris with his company, and associated himself with Dominique and Romagnesi, with great success. In 1729, the duke of Parma appointed him inspector of the theatres in his dominions; but, in 1731, he returned to Paris, where he devoted his last years to literature, and died in 1753, He was the author of numerous comedies, and translated several pieces from the French. We have also by him an *Histoire du Théâtre Italien.* His wife Helen (born 1686) distinguished herself on the stage, and by her poetical compositions, which procured her admission into several Italian academies. Their son Francesco, born at Mantua in 1707, died at Paris in 1772, was more successful as a dramatic writer than as an actor. Besides his comedies, which were very popular, he wrote a work entitled *L'Art du Théâtre* (Paris, 1750). His wife, born at Paris in 1714, is esteemed one of the best French novelists. She suffered much from the neglect of her husband, and died in poverty, in 1792. Her complete works have been several times published (best edition, Paris, 1818, 6 vols., 8vo.)

RICE (*oryza sativa*). This important article of food is now cultivated in all the warmer parts of the globe. It was long known in the East before it was introduced into Egypt and Greece. Pliny, Dioscorides and Theophrastus mention it as being brought from India; but it was little cultivated in their time upon the borders of the Mediterranean. It was introduced into Carolina about the year 1697, and is now cultivated extensively in many parts of the south of Europe. In Britain, the chief supply of rice is from Carolina; and this is considered far superior to the India rice, which is small, meagre, and the grains frequently broken. Immense districts of country would have remained desolate and irreclaimable, if nature had not granted to a simple grass the property of growing exclusively in inundated and marshy grounds. It has altered the face of the globe and the destiny of nations; for there can be no doubt that it is to this grain that the Chinese and Hindoos owe their early civilization. An immense population in those and the surrounding countries is now dependent on the rice crops; and when these fail, thousands perish of hunger.

The culm of the rice is from one to six feet high, annual, erect, simple, round, and jointed; the leaves are large, firm, and pointed, arising from very long, cylindrical, and finely striated sheaths; the flowers are disposed in a large and beautiful panicle, somewhat resembling that of the oat. The seeds are white and oblong, but vary in size and form in the numerous varieties. It is important to be acquainted with these varieties, in order to choose which are best suited to certain soils or localities; some are preferable on account of the size and excellence of the grains; others, from their great bearing, or the time of ripening; others, again, from their more or less delicacy with respect to cold, drought, &c. The Hindoos, Chinese, Malays, and the inhabitants of the neighbouring islands have paid most attention to the cultivation of these varieties. One species only of rice is known. Rice can be profitably cultivated only in warm climates; and here it is said to yield six times as much as the same space of wheat lands. The Chinese obtain two crops a year from the same ground, and cultivate it in this way from generation to generation on the same soil, and without any other manure than the mud deposited by the water of the river used in overflowing it. After the waters of the inundation have withdrawn, a few days are allowed for the mud to become partially dry; then a small plot is enclosed by an embankment, lightly ploughed and harrowed, and the grain, previously steeped in dung diluted with animal water, is then sown very thickly on it. A thin sheet of water is immediately brought over it, either by a stream or the chain-pump. In the mean time, other spaces are preparing for being planted in a similar manner. When the plants are six or seven inches high, they are transplanted in furrows made by the plough, so as to stand about a foot apart every way: water is then brought over them, and kept on till the crop begins to ripen, when it is withheld; so that when the harvest arrives the field is quite dry. It is reaped with a sickle, threshed with a flail, or the treading of cattle, and the husk is taken off by beating it in a stone mortar, or passing it between flat stones, or in a common meal mill. The first crop being cut in May, a second is immediately prepared for, by burning the stubble, and this second crop ripens in October or November. After removal, the stubble is ploughed in, which is the only vegetable manure such lands can be said to receive. In Japan, Ceylon, and Java, aquatic rice is cultivated nearly in the same manner. A rice plantation requires constant attention. The proprietor must make daily visits, in order to see that the various aqueducts, flood-gates, and embankments of the different compartments are all in order, and that the water constantly remains at the same height. The maturity of the grain is ascertained by the yellowness of the straw, and it is harvested much in the same manner as other grains, with this difference, that in certain districts the tops only are cut. Rice, when stored in the granary, is subject to the depredations of a small curculio; but it is found that this insect attacks it only when enveloped in the husk. Aquatic rice is cultivated by the Chinese, even in the midst of rivers and lakes, by means of rafts made of bamboo, and covered with earth. Mountain rice is cultivated on the mountains of the eastern islands and of Cochin-China, much in the same way as our barley; but it is to be observed that it is planted at the commencement of the rainy, and reaped at the beginning of the dry season, and also that these mountains receive from the atmosphere a much greater proportion of moisture than lower districts. There is a kind of rice hardy enough to grow on the edge of the Himalaya snows, and which may probably, at some future time, prove a valuable acquisition to the European cultivator. Rice is even cultivated in the south of Germany, and, from long culture in a comparatively cold country, has acquired a remarkable degree of hardiness and adaptation to the climate—a circumstance which has frequently been alluded to as an encouragement to the acclimating of exotics: it is found that rice seeds direct from India will not ripen in Germany at all, and even Italian or Spanish seeds are much less early and hardy than those ripened on the spot. A crop has been obtained in England, on the banks of the Thames. In some parts of the East, rice is freed from the husks by immersion in hot water, by which the grains are slightly swelled, and burst the envelopes.

As an article of diet, rice has been extolled as superior to almost any other vegetable. Large quantities are annually imported into Europe, and it is highly esteemed in puddings and numerous other culinary preparations. On account of its being destitute of gluten, it cannot be made into bread, like wheat. Indeed, on account of its excellence and cheapness, it claims attention as a general article of sustenance for the poorer classes of society; as it is well known that a quarter of a pound of rice, slowly boiled, will yield more than a pound of solid and nutritive food. However, it has been found that, in Europe, the poor constantly reject the use of rice when potatoes are to be had; and, in truth, it does not seem to be so well adapted to European constitutions as that root. The inhabitants of the East obtain from rice a vinous liquor, more intoxicating than the strongest wine; and an ardent spirit, called *rak* or *arrack*, is also partly made from it. The latter is chiefly manufactured at Batavia, and at Goa, on the coast of Malabar, and is said to be distilled from a mixture of the infusion of rice and of the juice of the cocoa-nut tree. The general appellation of rice throughout the East Indies is *paddy*.

RICE-BUNTING, or BOB-O-LINK (*icterus agripennis*, Bonap.; *emberiza oryzivora*, Wilson); specific characters, tail-feathers very acute; adult male in spring dress, black; the hind head, yellowish-white; scapulars, rump, and tail coverts, white, tinged with ash; female young, and male in early autumn and winter dress, varied with brownish-black and brownish-yellow, beneath dull yellow; the male with much more yellow. This bird migrates over the continent of America from Labrador to Mexico, and over the Great Antilles, appearing in the southern extremity of the United States about the middle of March or beginning of April. About the first of May, the bob-o-links reach Massachusetts. The rearing of their young takes place north of the fortieth degree of latitude. Their food is insects and worms, and the seeds of the grassy meadows. In the autumn, they sometimes attack the crops of oats and barley. The song of the male continues, with little interruption, as long as the female is sitting, and is singular and pleasant; it consists of a jingling medley of short, variable notes, confused, rapid, and continuous. The relish for song and merriment is confined to the male, and diminishes as the period of incubation advances. The male generally loses his musical talent about the end of the first week in July, from which time, or somewhat earlier, his plumage begins to lose its gay colours, and to assume the humble hue of that of the female. About the middle of August, they enter New York and Pennsylvania, in vast foraging parties, on their way to the south. There, along the shores of the large rivers lined with floating fields of wild rice, they find abundant subsistence, grow fat, and their flesh becomes little inferior in flavour to that of the European ortolan; on which account the reed or rice birds, as they are then called, are shot in great numbers. When the cool nights in October commence, they move still farther south, till they reach the islands of Cuba and Jamaica.

RICE GLUE. See *Cements*.

RICHARD I., king of England, surnamed Cœur de Lion, second son of Henry II., by Eleanor of Guienne, was born in 1157. In 1173, he was induced by his mother to unite with his brothers, Henry and Geoffry, and other confederates, in a rebellion against his father, which, however, that active prince soon quelled. This conduct he repeated on more than one occasion, until, in 1189, he openly joined the king of France, and, in the war which ensued, pursued the unhappy Henry from place to place, who, being at the same time deserted by his youngest son, died, worn out with chagrin and affliction, at Chinon, cursing his undutiful and ungrateful children with his latest breath. (See *Henry II.*) On this event, Richard succeeded to the throne of England, and, visiting his father's corpse the day after his decease, expressed great remorse at his own conduct. Having settled his affairs in France, he sailed to England, and was crowned at Westminster. He prudently gave his confidence to his father's ministers, and discountenanced all who had abetted his own rebellion. He had taken the cross previously to his accession, and now bent all his views to the gratification of his martial ardour in the fields of the East. He raised money by the sale of the crown property and offices, and by every other means he could devise, including the remission of a large sum of the vassalage imposed by his father upon Scotland. He then sought an interview with Philip of France, who had also taken the cross, in which mutual conditions respecting their joint operations were agreed upon. A great number of English barons and others took the cross on this occasion, to which enterprise a massacre of the Jews, in several of the principal towns of the kingdom, formed a prelude. At midsummer, 1190, Richard and Philip united 100,000 of their bravest subjects on the plains of Vezelai. Richard then proceeded to embark at Marseilles, and the two kings met at Messina, where they spent the winter. Here Richard was joined by Berengaria, daughter of Sanchez, king of Navarre, his intended wife; but, without staying to celebrate his nuptials, he put to sea with his fleet, which was soon after dispersed by a storm. The king got into Crete; but those of his ships which had his bride and his sister, the queen of Sicily, on board, were driven into Cyprus, where the king of that island imprisoned the crew, and refused to deliver up the princesses. In revenge for this insult, Richard landed his army, and obliged the king to surrender himself and his sovereignty. In Cyprus, he consummated his nuptials, and then embarked for Palestine. At this period, the siege of Acre was carrying on by the remnant of the army of the emperor Frederic, and other Christian adventurers, and defended by a Saracen garrison, supported by the celebrated Saladin. (q. v.) The arrival of the two kings infused new vigour into the besiegers, and the place surrendered in July, 1191. This advantage was, however, succeeded by mutual jealousies, more especially excited by a contest for the crown of Jerusalem, between Lusignan and Conrad of Montferrat; the former being supported by Richard, and the latter by the king of France. At length, disgusted with a warfare in which he only acted a secondary character, the latter returned to Europe, leaving 10,000 men with Richard. A general engagement took place, in which Richard, by the greatest bravery and military skill, gained a complete victory, which was followed by the possession of Joppa, Ascalon, and other places. Richard advanced within sight of Jerusalem; but, the greater part of the auxiliaries refusing to concur in the siege, he retired to Ascalon, and, perceiving his difficulties increase, concluded a truce with Saladin, on condition that Acre, Joppa, and the other seaports of Palestine, should remain in the hands of the Christians, who were also to enjoy full liberty of performing pilgrimages to Jerusalem. Richard now prepared to return to England, but previously concurred in the election of Conrad (almost immediately after assassinated) to the nominal sway of Jerusalem, and bestowed his conquered kingdom of Cyprus upon Lusignan. He embarked at Acre in October, 1192, and sailed for the Adriatic; but was wrecked near Aquileia. Taking the disguise of a pilgrim, he pursued his way through Germany, until, being discovered near Vienna, he was arrested by the order of Leopold, duke of Austria, who, having received an affront from him in Palestine, seized this opportunity to gratify his avarice and revenge. The emperor, Henry VI., who had also a quarrel with Richard, for his alliance with Tancred, the usurper of the crown of Sicily, hearing of his captivity, demanded him from Leopold, who gave him up, on the stipulation of a portion of his ransom. While Richard was imprisoned, his brother John, had taken up arms in England, in concert with the king of France. Richard bore his misfortunes with courage, and when the emperor charged him, before the diet of Worms, with various imaginary offences, he refuted these accusations with so much spirit, that the assembly loudly exclaimed against his detention. At length a treaty was concluded for his liberation, on the payment of a ransom of 150,000 marks, which being raised in England, Richard obtained his liberty. Richard embarked at the mouth of the Scheldt, and safely reached England in March, 1194, to the great joy of his subjects. After being re-crowned in England, he landed in France in May, 1194, where he was met by his brother John, who threw himself at his feet, and, under the mediation of his mother, entreated forgiveness. "I forgive him," said Richard, "and I hope I shall as easily forget his injuries as he will my pardon." In the ensuing war with Philip, Richard gained some advantages; but a truce soon suspended their hostilities. Leopold, having received an accidental hurt which proved mortal, expressed remorse for his treatment of Richard, and gave up all claim to the remainder of his ransom. The emperor also offered to remit the remainder of his debt, provided he would join him in an offensive alliance against France, which was readily agreed to. England, during this period of useless contention, partly through the rapacity of government, and partly through unpropitious seasons, productive of famine and pestilence, was in a state of great depression. A lasting accommodation with France was in agitation, preparatory to another crusade, when the life and reign of Richard were suddenly brought to a close. A considerable treasure having been found in the land of the viscount of Limoges, he sent part of it to Richard as his feudal sovereign. The latter, however, demanded the whole; which being refused, he invested the castle of Chalus, where the treasure was concealed, and, having refused terms of surrender to the garrison, in the openly expressed determination of hanging the whole of them, was wounded by a shot from the cross-bow of one Bertrand de Gourdon. The assault was, however, successfully made, and all the garrison hanged with the exception of Gourdon, who was reserved for a more cruel death. Richard, apprized that his wound was mortal, asked him what had induced him to attempt his life. The man replied, "You killed my father and my brother with your own hand, and designed to put me to an ignominious death." The prospect of death had inspired Richard with sentiments of moderation and justice, and he ordered Gourdon to be set at liberty, and allowed a sum of money; but the savage Marcadée, who commanded the Brabançons, which the king had hired for the expedition, caused the unhappy man to be flayed alive. Richard died of his wound on the 6th of April, 1199, in the forty-second year of his age, and tenth of his reign, leaving no issue. The character of this king was strongly marked. He was the bravest among the brave, often frank and liberal, and not devoid of generosity. At the same time, he was haughty, violent, unjust, rapacious, and sanguinary; and, to use the expression of Gibbon, united the ferocity of a gladiator to the cruelty of a tyrant. His talents were considerable, both in the cabinet and in the field, and he was shrewd in observation, eloquent, and very happy at sarcasm. He was also a poet; and some of his reputed compositions are preserved among those of the Troubadours. On the whole, a sort of romantic interest is attached to the character and exploits of this prince, which in the eye of reason, they little merit, as the career of Richard produced calamities poorly atoned for by the military reputation which alone attended it.

RICHARD II., king of England, son of Edward the Black Prince, and grandson of Edward III., was born in 1366. He succeeded the latter in 1377, in his eleventh year, the chief authority of the state being in the hands of his three uncles, John of Gaunt, duke of Lancaster, Edmund, earl of Cambridge, afterwards duke of York, and Thomas of Woodstock, subsequently duke of Gloucester. The earlier years of the king's minority passed in wars with France and Scotland, the expense of which led to exactions that produced the insurrection headed by Wat Tyler. Its termination in the death of its chief leader in Smithfield, by the hand of the lord mayor of London, in the presence of the young king, afforded the latter an opportunity to exhibit a degree of address and presence of mind, which, in a youth of fifteen, was very remarkable. While the rioters stood astonished at the fall of their leader, the young king calmly rode up to them, and, declaring that he would be their leader, drew them off almost involuntarily, into the neighbouring fields. In the mean time, an armed force was collected by the lord mayor and others, at the sight of which the rioters fell down on their knees and demanded pardon, which was granted them on the condition of their immediate dispersion. Similar insurrections took place in various parts of the kingdom, all of which were, however, put down, and Richard, now master of an army of 40,000 men, collected by a general summons to all the retainers of the crown, found himself strong enough to punish the ringleaders with great severity, and to revoke all the charters and manumissions which he had granted, as extorted and illegal. The promise of conduct and capacity which he displayed on this emergency was but ill answered in the sequel; and he very early showed a predilection for weak and dissolute company, and the vicious indulgences so common to youthful royalty. In his sixteenth year, he married Anne, daughter of the emperor Charles IV., and, soon after, was so injudicious as to take the great seal from Scroop, or refusing to sanction certain extravagant grants of land to his courtiers. Wars with France and Scotland, and the ambitious intrigues of the duke of Lancaster, disquieted some succeeding years. The favourites of Richard were Michael de la Pole, earl of Suffolk and chancellor, and Robert de Vere, earl of Oxford, the latter of whom he created duke of Ireland, with entire sovereignty in that island for life. The duke of Lancaster, being then absent, prosecuting his claim to the crown of Castile, the king's younger uncle, the duke of Gloucester, a prince of popular manners, and unprincipled ambition, became the leader of a formidable opposition, which procured an impeachment of the chancellor, and influenced the parliament so far that it proceeded to strip the king of all authority, and obliged him to sign a commission appointing a council of regency for a year. Being now in his twenty-first year, this measure was very galling to Richard, who, in concert with the duke of Ireland, found means to assemble a council of his friends at Nottingham, where the judges unanimously declared against the legality of the extorted commission. Gloucester, at these proceedings, mustered an army in the vicinity of London, which being ineffectually opposed by a body of forces under the duke of Ireland, several of the king's friends were executed, and the judges who had given their opinion in his favour, were all found guilty of high treason, and sentenced to imprisonment for life in Ireland. A re-action was soon produced by the tyranny of the ascendant party; so that, in 1389, Richard was encoraged to enter the council, and, in a resolute tone, to declare that he was of full age to take the government into his own hands; and, no opposition being ventured upon, he proceeded to turn out the duke of Gloucester and all his adherents. This act he rendered palatable to the nation by publishing a general amnesty, and remitting the grants of money made by the late parliament. Several years of internal tranquillity ensued, which was promoted by the return of the duke of Lancaster, who formed a counterbalance to the influence of the duke of Gloucester; and Richard prudently kept on the best terms with him. By his fondness for low company, by spending his time in conviviality, and amusement with jesters, and persons of mean station and light behaviour, the king forfeited the respect of his subjects, while his weak attachment to his favourites placed all things at their disposal, and made a mere cipher of himself. Encouraged by these follies the duke of Gloucester once more began to exercise his sinister influence, and, the most criminal designs being imputed to him, Richard caused him and his two chief supporters, the earls of Arundel and Warwick, to be arrested. The earl of Arundel was executed, and the earl of Warwick condemned to perpetual banishment. The duke of Gloucester had been sent over to Calais for safe custody, and was there suffocated. A quarrel between the duke of Hereford, son of John of Gaunt, and the duke of Norfolk, was the incidental cause of the revolution which terminated this unsettled reign. The king banished both the dukes—Norfolk for life, and Hereford for ten, afterwards reduced to six years. It was, however, declared that each of them should be duly entitled to any inheritance which might fall to them during their absence; but, on the death of John of Gaunt, in 1399, the unprincipled Richard siezed his property as forfeited to the crown. The king having embarked for Ireland to revenge the death of his cousin, the earl of March, who had been killed in a skirmish with the natives, Henry Bolingbroke as the duke of Hereford was now called, made use of this opportunity to land in Yorkshire, with a small body of forces, and, being joined by the earls of Northumberland and Westmoreland, and other influential leaders, proceeded southward, at the head of 60,000 men, nominally to recover his duchy of Lancaster. When Richard upon this intelligence, landed at Milford haven, he found himself so much deserted, that he withdrew to North Wales, with a design to escape to France. He was, however, decoyed to a conference with Henry, seized by an armed force, and led by his successful rival to London. As they entered the capital, Henry was hailed with the loudest acclamations, and the unfortunate Richard treated with neglect and even contumely. His deposition was now resolved upon, to be preceded by a forced resignation of the crown. Thirty-five articles of accusation were accordingly drawn up against him, of which several were exaggerated, false and frivolous, but others contained real instances of tyranny and misgovernment; and king Richard was solemnly deposed Sept. 30, 1399. Henry then claimed the crown, which was awarded to him. (See *Henry IV.*) Richard was committed, for safe custody, to the castle of Pomfret. Of the manner of his death no certain account has been given; but a popular notion prevailed, that his keeper and guards killed him with halberds. It is more probable that starvation or poison was had recourse to, for his body, when exposed, exhibited no marks of violence. He died in the thirty-fourth year of his age, and twenty-third of his reign.

RICHARD III., king of England, born in 1450, was the youngest son of Richard duke of York. On the accession of his brother, Edward IV., he was created duke of Gloucester, and, during the early part of Edward's reign, served him with great courage and fidelity. He partook of the ferocity which was ever a dark feature in the character of the Plantagenets; and is said to have personally aided in the murder of Edward prince of Wales, after the battle of Tewksbury, and to have been the author, if not the perpetrator, of the murder of Henry VI. in the Tower. This bloody disposition was, however, united in him with deep policy and dissimulation, which rendered him still more dangerous. He married, in 1473, Anne, who had been betrothed to the murdered prince of Wales, joint heiress of the earl of Warwick, whose other daughter was united to the duke of Clarence. Quarrels arose between the brothers on the division of the inheritance of their wives; and Richard, who found his elder brother an obstacle to his views of aggrandisement, combined in the accusations against that weak and versatile prince, which brought him to destruction. On the death of Edward, in 1483, the duke of Gloucester was appointed protector of the kingdom; and he immediately caused his nephew, the young Edward V., to be declared king, and took an oath of fealty to him. The two ascendant factions, that of the queen's relatives, headed by her brother, earl Rivers, and that of the more ancient nobility, who were led by the duke of Buckingham and lord Hastings, courted the favour of the protector, who dissembled with each, while he was secretly pursuing the schemes of his own dark ambition. His first object was to get rid of those who were connected with the young king by blood; and, after spending a convivial evening with Rivers, Grey, and sir Thomas Vaughan, he had them arrested the next morning, and conveyed to Pomfret, where they were soon after executed without trial. Alarmed at the arrest of her relatives, the queen dowager took refuge in the sanctuary at Westminster, with her younger son, the duke of York, and her daughter. As it was necessary, for the protector's purposes, to get both his nephews into his hands, he persuaded two prelates to urge the queen to deliver the duke of York into his hands, upon the most solemn assurances of safety. Lord Hastings, although opposed to the queen's relatives, being the steady friend of her children, was next arrested, while sitting in council, and led to immediate execution. After this bold and bloody commencement, he proceeded in an attempt to establish the illegitimacy of Edward's children, on the pretence of a previous marriage with the lady Eleanor Talbot, daughter of the earl of Shrewsbury, and scrupled not to countenance an attack on the character of his own mother, who was affirmed to have given other fathers to Edward and Clarence, and to have been true to her husband only in the birth of Richard. All these pleas were dwelt upon in a sermon preached at St Paul's cross. The duke of Buckingham afterwards, in a speech before the corporation and citizens of London, enlarged upon the title and virtues of the protector, and then ventured to ask them whether they chose the duke of Gloucester for king. On their silence, he repeated the question, and a few prepared voices exclaimed, "God save king Richard!" This was then accepted as the public voice, and Buckingham, with the lord mayor, repaired to the protector with a tender of the crown. He at first affected alarm and suspicion, and then pretended loyalty to his nephew, and unwillingness to take such a burden upon himself, but finally acceded; and he was proclaimed king on the 27th of June, 1483, the mock election being secured by bodies of armed men, brought to the metropolis by himself and Buckingham. The deposed king and his brother were never more heard of, and, according to general belief, they were smothered in the Tower of London, by order of their uncle. (See *Edward V.*) The new reign commenced with rewards to those who had been instrumental to the change, and with endeavours to obtain popularity. Richard, with a splendid retinue, made a progress through several provincial towns, and was crowned a second time at York, on which occasion he created his only son prince of Wales. But hatred and abhorrence of Richard soon became the general sentiment of the nation, and all men's eyes were turned towards Henry, earl of Richmond, maternally descended from the Somerset branch of the house of Lancaster. Buckingham, not thinking himself adequately rewarded, entered into a conspiracy against him, with other malcontents in the south and west of England, but was suddenly deserted by his followers, betrayed into the hands of authority, and executed without trial. About the same time, the earl of Richmond, who had embarked with a fleet from St Malo, encountered a violent storm, and was obliged to return. The death of his son, the prince of Wales, was a severe stroke to Richard; and such was the odium attached to his character, that the death of his wife, which followed soon after, was, without the least evidence, attributed to poison. He immediately determined to marry his niece Elizabeth, the daughter of his brother Edward, and legitimate heiress of the crown, in order to prevent her union with Richmond. In August, 1485, Richmond landed with a small army at Milford haven. Richard, not knowing in what quarter to expect him, was thrown into much perplexity, which was aggravated by his suspicion of the fidelity of his nobles, and especially the Stanleys, the chief of whom had become the second husband of Margaret, the earl of Richmond's mother. When informed of the advance of his rival, he, however, took the field with great expedition, and met him with an army of 15,000 men at Bosworth, in Leicestershire. Richmond had only 6000 men, but relied on the secret assurances of aid from Stanley, who commanded a separate force of 7000. The battle was fought on the 23d of August, 1485; and, in the midst of it, Stanley, by falling on the flank of the royal army, secured the victory to Richmond. (See *Henry VII.*) Richard, finding his situation desperate, rushed against his competitor, slew his standard-bearer, and was on the point of encountering Richmond himself, when he sunk under the number of his assailants. The body of Richard was found in the field stripped naked, in which condition it was carried across a horse to Leicester, and interred in the Greyfriars' churchyard. Thus fell this odious prince, in his thirty-fifth year, after possessing the crown, which he had acquired by so many crimes, for two years and two months. Richard possessed courage, capacity, eloquence, and most of the talents which would have adorned a lawful throne. Many of his bad qualities have probably been exaggerated, but undeniable facts prove his cruelty, dissimulation, treachery, and relentless ambition. Gibbon has answered the Historic Doubts of Walpole concerning the reign and character of Richard. Richard III. has been represented as of small stature, deformed, and of a forbidding aspect; but there is some testimony to prove that his personal, like his mental, defects, have been magnified by the general detestation of his character.

RICHARDSON, Samuel, a distinguished English novelist, was born in 1689, in Derbyshire, and received only a common school education. He early discovered a talent for story-telling and letter-writing, and, at the age of thirteen, was the confidant of three young women in their love secrets, and employed by them in their amatory correspondence. "One of the young women," he himself informs us, "highly gratified with her lover's fervour and vows of everlasting love, has said, when I have asked her what to write—'I cannot tell you what to write, but (her heart on her lips) you cannot write too kindly.' All her fear was only that she should incur a slight for her kindness." At the usual age, Richardson was bound apprentice to Mr John Wilde, a printer of Stationer's hall, London, and, after the expiration of his apprenticeship, passed five or six years as a foreman in a printing-office, until at length he set up for himself. His habits of diligence, accuracy, and honourable dealing, acquired him an extensive business; and, beginning to thrive in the world, he married the daughter of his former master. His Pamela, the first work which gave him distinction as a writer, was published in 1741. The first two volumes were completed in two months; and so great was its popularity, that it ran through five editions in one year, and was even recommended from the pulpit. The novelty of his plan, with many passages of great beauty, and interesting traits of character, may account for much of this reception; but, even at that time, critics existed who entertained those opinions of its imperfections, and doubts of its salutary tendency, which have since become almost general. He was led, by a spurious continuation, to add two volumes to his Pamela, which are inferior to the former; but, in 1748, the appearance of the first two volumes of his Clarissa fully established his literary reputation; and its pathos, its variety of character, and minute development of the movements of the human heart, will cause it ever to be regarded as a noble monument of its author's genius. The History of Sir Charles Grandison appeared in 1753. The interest taken in this work was not equal to that produced by the former, although perhaps exhibiting more compass and invention; but the character of the hero is in some degree repulsive, and the prolixity of the author began to engender satiety. The character of Clementina is a masterly example of delicate delineation. This work was, as well as the preceding, translated into foreign languages, and received with great applause. In all the productions of Richardson, the style is inelegant, gossipping and verbose, and he seldom knows when to leave off. In 1754, he rose to be master of the Stationers' company; and, in 1760, purchased a moiety of the patent of law printer to the king. As he grew rich, he indulged himself with a country residence at Parson's-green, Middlesex, where he lived, surrounded with a circle of affectionate admirers, particularly females, to whom it was his delight to read his works in the progress of composition. He died of an apoplexy, in 1761, at the age of seventy-two, and was buried in the church of St Bride, in Fleet street. His correspondence was published in 1804, in 6 vols., 8vo., with a life, by Mrs Barbauld.

Richardson's manners were formal and retiring, arising from a very debilitated state of the nerves and a natural bashfulness, but he was in reality most generous and open-hearted. He gave away a great deal of money in charity; and was so fond of inviting friends to stay with him, that when they were ill, he and his family must needs have them to be nursed, and several actually died at his house, as at an hospital for sick friends. In business, he was regular and industrious. He used to give his orders to his workmen in writing, a practice which Sir John Hawkins attributes to stateliness and bad temper, but for which Mrs Barbauld finds a better reason in his bad nerves. He encouraged his men to be industrious, sometimes by putting half-a-crown among the types, as a prize to him who came first in the morning, at others by sending fruit for the same purpose from the country. Regarding his personal appearance, he describes himself, in middle age, in a letter to a lady, as "short, rather plump, about five feet five inches, fair wig, one hand generally in his bosom, the other a cane in it, which he leans upon under the skirts of his coat, that it may imperceptibly serve him as a support, when attacked by sudden tremors or dizziness; of a light brown complexion, teeth not yet failing;—looking directly forward, as passengers would imagine, but observing all that stirs on either hand of him, without moving his short neck; a regular even pace, stealing away ground without seeming to rid it; a grey eye, too often overclouded by mistiness from the head; by chance lively, very lively, if he sees any he loves."

Richardson was twice married, and had several children, but only four daughters grew up to comfort him in his old age.

RICHELIEU, Armand Jean du Plessis, cardinal, duke de, one of the greatest statesmen of France, was born at Paris, in 1585, and at the age of twenty-two years was made bishop of Luçon. His country had already been restored from its long troubles to tranquillity, prosperity, and order, by Henry IV. and his great minister Sully. In 1616, the queen-mother, Mary of Medici, into whose favour Richelieu had insinuated himself, made him her grand almoner and one of the secretaries of state. On the disgrace of the queen (*see Mary of Medici*), he continued attached to her cause, and effected a reconciliation between her and her son Louis XIII. (1619), which, however, was soon interrupted by her intrigues against the constable Luynes, the favourite of the king. Richelieu, who was thus placed between the two contending parties, loved by neither, but considered by both as a useful instrument, had a difficult part to act, and it required all his prudence to enable him to keep his position. In 1622, he obtained the cardinal's hat, through the influence of Mary, and, in 1624, entered the council of state, and was soon at the head of affairs. The premier now felt himself in a condition to drop the mask which he had hitherto worn, and Mary too late regretted the protection she had extended to him. The adherence of this princess to the political system of the house of Hapsburg was injurious to the interests of France. Almost all the French princes had kept up a constant opposition to that powerful family, and no sooner was Richelieu seated in his high post, than he began systematically to extend the power of the crown by overthrowing the privileges of the great vassals, and to increase the influence of the French monarchy by undermining that of the Hapsburgs, both beyond the Pyrenees and in Germany. Louis XIII., who was sensible of the energy of his minister, favoured his plans, while he always showed a dislike for the man, whom he would gladly have destroyed, had he been able to govern without him. The Reformed (Huguenots) in France had for a long time resisted the royal power; and bloody insurrections, in several preceding reigns, had arisen from their struggles with the spiritual and temporal authorities, in defence of their civil rights and freedom of conscience. The wisdom and mildness of Henry IV. had assuaged the excitement of the contending parties, but his reign was too short to extinguish the fires which still glowed beneath the embers. The struggle for religious freedom was too often, indeed, made a pretext, by the nobles, and even the princes of the blood royal, to cloak and further their own ambitious designs; and both religious parties, Catholics as well as Protestants, had thus alternately served as a check upon the despotic exercise of the royal power. Richelieu, therefore, resolved to crush the weaker by the aid of the stronger party, and thus to deprive those, who should be disposed to resist his schemes, of their main prop. By the edict of Nantes, the Huguenots had been placed on nearly the same footing with the other subjects of the kingdom: there were some provinces in which they had the ascendency, and their armed force was sufficient to shake the throne, should they be excited to rise against it. Their rallying point was Rochelle; and Richelieu neglected no means to make himself master of that city. In the celebrated siege of Rochelle, he commanded the army in person. The attack and defence of the place are considered as affording models of perseverance, valour, and military skill. Rochelle, supported by England, from which it continually received supplies, held out for a longtime against all the efforts of the cardinal; and the hope of reducing it was already nearly abandoned, when Richelieu, by the erection of an immense mole, cut off the communication by sea, and finally compelled it to surrender by famine (1629.) The second step of Richelieu was the removal of the queen-mother from court. That princess endeavoured to effect the fall of the minister: she had already gained over the king to her purpose, in a secret interview, when Richelieu entered the cabinet: the queen overwhelmed him with reproaches. He continued calm, had recourse to prayers and tears, and finally requested the king's permission to leave the court. The preparations were already made for his departure; but the king, who was not less offended by the violence of the queen, than pleased by the respectful demeanor of the cardinal, asked the advice of his favourite, St Simon. The latter represented to him the services of Richelieu, and the impossibility of dispensing with his aid. Louis, therefore, ordered him to Versailles, and assigned him apartments in the palace directly below his own. This day (November 10, 1630), on which the hopes of the queen and of the cardinal's enemies were disappointed, was called the "day of the dupes" (*la journée des dupes*.) As the queen continued to declare herself irreconcileable with Richelieu, the cardinal prevailed upon the king to banish her (1631) to Compiegne, removed her friends from place, and threw some of them into the Bastile. This step, and the almost total annihilation of the privileges of the parliaments and the clergy, excited all classes against the despotic administration of the cardinal, and the discontents broke out in numerous risings and conspiracies, which, however, were not only suppressed by the prudence and vigour of his measures, but also contributed to the furtherance of his plan, and gradually rendered the royal power entirely absolute. In 1632, the royal arms, directed by Richelieu, suppressed the rebellion of the dukes of Orleans and Montmorency, the adherents of the banished queen, and Montmorency perished on the scaffold, although the royal family itself interceded in his behalf. Equally unsuccessful were the attempts of the dukes of Lorraine, Guise, Bouillon, &c.; even those whom the king privately favoured were obliged to yield to the all powerful minister, and paid with their lives for their rashness in venturing to oppose him, as in the instance of Cinqmars, who, a short time before Richelieu's death, had entered into a conspiracy against him, which the king was, not without reason, believed to have favoured. While the minister was thus extending the power of the crown at home, he did not neglect the aggrandizement of the monarchy abroad. The thirty years' war gave him an opportunity of effecting this object. The same man who persecuted, with the greatest severity, the Protestants in France, employed all the arts of negotiation, and even force of arms, to protect the same sect in Germany, for the purpose of humbling the house of Austria. The king of Sweden, the great bulwark of religious liberty in Germany, received aid of every kind from Richelieu, as long as he was not in danger of becoming formidable to France; but when the brilliant victories of Gustavus Adolphus gave the cardinal reason to consider his power as more dangerous than that of Austria, he abandoned that prince in the midst of his successes. The war which he undertook against Spain, and which continued till 1659, put France in possession of Catalonia and Roussillon, and the separation of Portugal from Spain was effected by his assistance. He also endeavoured to weaken the Austrian influence in Italy, and procured the transfer of the duchy of Mantua to the duke of Nevers. In general, however objectionable may have been his character as a man, the duke de Richelieu must be allowed to have deserved the character of a great statesman: he cannot be denied the glory of having raised the power of the sovereign in France to its highest pitch; but he was proud, arrogant, vindictive and unprincipled. The protection which he gave to letters and art (in the establishment of the French Academy, 1635, and of the *Jardin des Plantes*, for example) cannot reconcile us to his faults. (See *Corneille*.) Richelieu died December 4, 1642, after having indicated Mazarin as his successor. Louis XIII. died a few months after him; but in the long reign of Louis XIV., the effects of Richelieu's policy became visible. See *Maximes d'Etat ou Testament politique du Cardinal de Richelieu* (Paris, 1746), Leclerc's *Vie de Richelieu*, and Jay's *Histoire du Ministère de Richelieu* (1815.)

RICHELIEU, Louis François Armand du Plessis, duke de, marshal of France, member of the French academy, and of the academy of sciences, was born at Paris in 1696. His handsome person, his vivacity, and his wit, early made him a favourite at court, and particularly with the duchess of Burgundy (1711). His childish follies were made a handle of by malice, and the *jolie poupée*, as he was called at court, was thrown into the Bastile. After his release, he was made aid of marshal Villars, who was pleased with his liveliness, and his free and reckless manners. He was distinguished, even at the court of the regent, for his amours and affairs of honour, and was twice confined in the Bastile. In the twenty-fourth year of his age, the French academy chose him one of its members, although he had never written any thing beyond a *billet doux*, and was entirely ignorant of orthography. Fontenelle, Campistron, and Destouches, each, prepared for him an inaugural discourse, from each of which he selected such parts as he liked, to form a whole. He distinguished himself at the siege of Philipsburg (1734), and in the battle of Fontenoy (1745), by his courage and presence of mind. On the occasion of the marriage of the dauphin with the princess of Saxony, he was sent as ambassador to the court of Dresden, where he made the most extraordinary display of pomp. Nothing, however, could equal the magnificence of his entry into Vienna, as ambassador to that court, when the horses of his retinue were shod with silver, in such a manner that the shoes should fall off, to be picked up by the populace. In 1756, he was created marshal, and commanded at the siege of Mahon, which was occupied by the British. After the capture of that place (June 28, 1756), he received the command of the French army in Germany. But the marshal had offended Madame de Pompadour, by rejecting her proposal of a marriage between his son and her daughter; and after the convention of Closter Seven (1757), he was recalled. He had enriched himself while in Germany, where he had also indulged his soldiers in license and plunder, by his exactions. It should always be remembered to his credit, that he dissuaded Louis XV. from persecuting the Protestants. His example contributed greatly to extend the prevalence of licentiousness in France, since he was the dictator of fashion. He continued to prosecute affairs of gallantry even in his old age, and he married, the third time, at the age of eighty-four years. The *Mémoires du Maréchal de Richelieu* were written, under his direction, by Soulavie. He died August 3, 1788, ninety-three years old; and two days before his death, a lady having observed to him that his face still retained its beauty, he replied, "Madame, you take my face for your mirror." Marshal Richelieu had the courage, the fortune and the talents of a great general, the capacity, prudence and penetration of a great statesman; but, with these and many amiable qualities, he chose to be nothing but a common courtier.

RICHELIEU, Armand Emanuel du Plessis, duke de, minister of state under Louis XVIII., grandson of the preceding, was born at Paris in 1766, and, after studying in the college of Plessis, travelled in Italy, whence he returned, at the commencement of the revolution, in 1789. He soon after obtained permission from the king to go to Vienna, where he was well received by the emperor Joseph II; but he soon quitted that capital with the young prince de Ligne, and entered into the service of Catherine II., then at war with the Turks. He distinguished himself at the taking of Ismail by Suwarrow, and was rewarded with the rank of major-general. In 1794, he was with Louis XVIII. in England, whence he returned to Russia; but, not being well treated by the emperor Paul, he quitted that country, and, after the peace of 1801, revisited France, where Bonaparte in vain attempted to attach him to his service. He went again to St Petersburg, and, at the commencement of 1803, was nominated civil and military governor of Odessa, a Russian colony on the Black sea, which flourished greatly under his superintendence. On the restoration of Louis XVIII., the duke de Richelieu took his seat in the chamber of peers, and resumed his functions as first gentleman of the bed-chamber. In March, 1815, he accompanied the king to Ghent, and, returning with him to Paris, after the battle of Waterloo, he was appointed president of the council of ministers, and placed at the head of the foreign department. He presided at the installation of the four academies in April, 1818, and in September following he was made president of the French academy. In the same month, he appeared at the congress of Aix-la-Chapelle. He subsequently resigned his office as minister of state (see *Decazes*, and *Louis XVIII.*); but on the assassination of the duke of Berry, in 1820, he again became president of the council. He fruitlessly opposed the establishment of the censorship of the press, and, finding he had lost his influence, he again retired from office (see *Villèle*), and died soon after, in May, 1822.

RICHMOND; a village of England, situated in the county of Surrey, nine miles S. W. from London, on an eminence on the south bank of the Thames, of great celebrity for the beauty of its scenery, and for having been, during several centuries, the seat of a royal palace, now demolished. George III. frequently resided here, in the early part of his reign; and an observatory was erected here from designs by Sir William Chambers. Part of the park is occupied by the royal gardens. The new, or great park, formed by Charles I., is well stocked with deer; it is enclosed by a brick wall eight miles in compass. The rich scenery of Richmond and its vicinity have been the theme of general admiration, and have attracted a number of families of distinction, whose seats render the village and neighbourhood remarkably gay and splendid. The village extends about a mile up the hill from the Thames, skirted and intermingled with agreeable gardens. The view from Richmond hill is particularly celebrated. Among the monuments in the church is one to Thomson, who resided here. Population in 1831, 7,243.

RICHMOND; a borough and market town in the North Riding of Yorkshire, situated (233 miles N. N. W. from London) on the eastern declivity of a steep hill, at the foot of which runs the river Swale, encircling one half of the town. The town appears to have been founded subsequently to the conquest of England, by William the Norman, who granted the territory of Richmondshire to his nephew Alan of Bretagne, and that nobleman, who was styled Earl of Richmond, built on the eminence a strong castle, around which houses were erected, which, increasing by degrees, at length formed a considerable town. The town consists of several streets, lighted with gas; the houses are neatly built, chiefly of stone; in the market-place are many handsome shops, and in the centre a column, beneath which is a reservoir filled with water for the supply of the town, brought by pipes from a spring at Aislebeck, where there is another reservoir. The river Swale is here crossed by a stone bridge of three arches, built in 1789. The principal trade carried on here is in corn and lead from the mines of Lancashire. There is a paper-mill, and ropes, twine, hair-cloth, and oil-cloth are manufactured here. A Literary and Scientific Society has been established in this town; and likewise a Mechanic's Institute, to which is attached a library. The remains of the castle, over-hanging the river, consists of part of the walls and the donjon tower, or keep, which is in tolerable preservation, having been repaired in 1761, by the duke of Richmond. Population in 1831, 3,900.

RICHMOND; a city, port of entry, and metropolis of Virginia, in Henrico county, 123 miles south by west of Washington; lat. 37° 32′ N.; lon. 77° 21′ W.; population, in 1820, 12,046; in 1830, 16,060, including 6345 slaves, and 1900 free blacks. The situation of Richmond is highly picturesque and healthful, and it is a flourishing commercial city. It is connected with a very extensive back country that is highly productive of wheat, corn, hemp, tobacco, and coal. The inland, coasting, and foreign trade of Richmond is extensive, and increasing. In 1811, December 26, the theatre at Richmond took fire during an exhibition, and seventy-two persons lost their lives in the conflagration.

RICHTER, Jean Paul Frederic, a German writer of the first rank in belles-lettres, was born, March 21, 1763, at Wunsiedel, in the Fichtelgebirge, and died November 14, 1825, at Baireuth. His father was, at the time of his birth, rector at Wunsiedel, at a later period pastor at Schwarzbach on the Saale. In 1780, Richter entered the university of Leipsic, in order to study theology, but soon changed his plan, and devoted himself to belles-lettres. As early as 1798, he was known as a distinguished writer at Leipsic. He went to Weimar, Berlin, Meiningen, &c., and settled at Baireuth, having been made counsellor of legation by the duke of Saxe-Hildburghausen, and having received from the prince primate (Dalberg) a pension, which the king of Bavaria continued after Baireuth had fallen to him. He seldom left his home, and only to make short journeys to the Rhine, Berlin, Dresden, &c. He had married during his early stay at Berlin, and had two daughters. Secured by his pension from want; happy in his domestic relations; blessed with numerous friends, and an almost childlike amiableness, which enjoyed to the last the pleasures of nature, as if they had been always new; having millions of admirers; unambitious of vain distinctions, or objects beyond his reach; with a heart susceptible of the noblest emotions; believing in man's goodness, and firmly relying on the immortality of the soul—he may be said to have been one of the happiest men that ever trod this earth. His death corresponded with his life; he calmly fell asleep. It would be difficult to give a distinct idea of Jean Paul's works (this was the name under which he wrote) in a brief sketch like ours. Jean Paul is a humorous writer, but his humour is of a peculiar sort. The want of a public life obliges the Germans to live much in reflection, the effect of which is visible in almost all their writings, and has left its traces in those of Jean Paul. His humour is deeply reflecting and philosophic, at the same time often truly comic. He frequently rises to the highest regions, where he can speak only in bold metaphors; and, before we are aware, we hear his inspiring tones die away like those of a lark, when the bird has come again to the ground. If it can be said of any man's writings that they are poetry in a prose form, it is true of many passages in Jean Paul's works. His writings are generally in the form of novels, but they have little of the character of what we generally understand by novels. He seems to have liked particularly to analyze emotions, to dissect individual character in every station, even the humblest. He does not exhibit man under those general influences which operate on large masses of men, but deals almost exclusively with the individual considered as such. He very frequently recurs to the immortality of the soul. In his writings, as in his life, he appears amiable in the highest degree. His works are the following:—Greenland Processes (Berlin, 1783); Selection from the Papers of the Devil (1788); the Invisible Lodge (1793); Hesperus (1795); Quintus Fixlein (1796; and 1800); Biographical Entertainments under the Skull of a Giantess (1796), Flower, Fruit and Thorn Pieces (1796); the *Jubelsenior* (1797); the Valley of Campan, with a Satirical Appendix (1797); Palingenesies (1798); Letters, and Future Course of Life (1799); Titan (1800—1805); *Die Flegeljahre** (1803—1805); Katzenberger's Journey to the Watering Place (1809); the Field Preacher Schmelzle's Journey to Flotz (1809), &c. In 1804, he produced his first philosophical work of importance, his Introduction (*Vorschule*) to Æsthetics (2d ed. 1809), to which he added, in his last years, a *Nachschule*, with an Appendix, containing Reviews (Breslau, 1825). It is full of original and discriminating views, yet hardly a philosophically systematic work. In 1807, he published his *Levana*, a work on education, full of intelligent views. We must mention, also, his *Fibel* (Spelling-book); Peace Sermon (1809); Change of Throne between Mars and Phœbus in 1814; Political Sermons in Lent (1817); several essays, for instance, in his Museum (1814), and *Herbstbluminen* (1810—1820). In 1820 appeared his Comet, or Nic. Markgraf, a comic work. Shortly before his death, he began a new edition of his complete works. After his death, appeared his unfinished work Selina, or on Immortality. From memorandums left by him, a work was prepared, after his death, called *Truths from Jean Paul's Life* (3 vols., Breslau, 1826—28.)

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* *Flegel* is the German for *clown*, *rude fellow*; and *Flegeljahre* (clown-years) signifies, in German, the period of transition from boyhood to manhood, when the character is unformed, and the manners embarrassed, awkward, and often rude.

RICINUS COMMUNIS. The *palma christi*, or castor oil plant, in Barbary, its native climate, often becomes a pretty stout tree, twenty or twenty-five feet in height; but, as cultivated with us, is an annual, herbaceous plant, not rising above six or eight; if, however, it be sheltered in a greenhouse, the stem persists, and becomes woody. The leaves are large, alternate, divided into six lobes, and peltate, or having the stalk inserted into the centre of the leaf. The flowers are disposed in long, branching spikes, the male occupying the inferior portion, which is contrary to the usual arrangement in monœcious plants. The fruit consists of three united, prickly capsules, each containing a large, smooth, shining, oblong, variegated seed. These seeds contain a virulent acrid and nauseous principle, which seems to reside exclusively in the germ. Hence it happens that, when eaten entire, two or three seeds will produce dangerous and even fatal effects, while the oil that is obtained from them in large quantities is mild, insipid, emollient, and gently purgative. This oil is procured by a moderate pressure, for the germ fortunately retains its oil with more pertinacity than the remainder of the seed; or by plunging the seeds in warm water, when the mild oil rises to the surface. The use of castor oil as a purgative is familiar to every one, and has been known from remote antiquity. In some countries, it is burnt in lamps, or is even employed with lime to make a cement, which with age becomes as hard as stone.

RICKETS (*rhachitis*), or ENGLISH DISEASE; a modification of the scrofula, which commonly appears after the age of nine months and before that of two years, attacking principally the bones. The disease is known by a large head, prominent forehead, projecting breast bone, flattened ribs, big belly, and emaciated limbs, with great debility. The bones and spine of the back are variously distorted. Nature frequently restores the general health, and leaves the limbs distorted. In the treatment of rickets, besides attention to the regimen, those means are employed by which the system is invigorated. Tonic medicines, the cold bath, &c., are beneficial. The child should be kept clean and dry, regularly exercised, and allowed to enjoy pure air. The food should be nutritious, and easy of digestion. The rickets sometimes manifests itself in adults, and often proves fatal in a short time.

RICOCHET. See *Range*.

RIDING. See *Horsemanship*, and *Manege*.

RIDING AT ANCHOR. See *Anchor*.

RIDINGS (corrupted from *trithing*); the three jurisdictions into which the county of Yorkshire is divided, on account of its extent. They are called the *North*, *East*, and *West* Ridings.

RIDLEY, Nicholas, bishop of London in the reigns of Edward VI. and his successor Mary, was born about the commencement of the sixteenth century, and educated at Cambridge. He travelled on the continent, and, during a three years' absence from his native country, became acquainted with several of the early reformers, whose doctrines he afterwards warmly espoused. Returning to Cambridge he filled the office of proctor to the university, and as such protested against the claims of the papal see to the supreme ecclesiastical jurisdiction in the realm. He was also chosen public orator, and, through the patronage of archbishop Cranmer (q. v.), became one of the king's chaplains, and, in the second year of Edward VI., he was elevated to the see of Rochester. Three years after, on the deprivation of Bonner, Ridley was made bishop of London, and distinguished himself by a tempered zeal in favour of the Protestant church, and especially by his liberality and kindness towards the family of his predecessor. On the death of Edward, a dread of the succession of a Roman Catholic sovereign induced him to listen to those who made an attempt to secure the Protestant ascendency, by placing the lady Jane Grey upon the throne. The defeat of this scheme, the active part he had taken in the establishment of the new discipline, and the construction of the liturgy, together with his connexion with Cranmer, marked Ridley out as one of the most prominent victims of papal authority. The form of a trial was, indeed, granted him: a deputation of popish bishops was appointed to hold a formal disputation on the controverted points with him at Oxford, and he was condemned, as a recusant and obstinate heretic, to the stake. This sentence he underwent with the greatest fortitude, in company with his friend and fellow-sufferer Latimer, Oct. 15, 1555, in Oxford. His life has been written by the reverend doctor Ridley, prebendary of Salisbury.

RIDOTTO; a masquerade, attended with music and dancing, and other amusements. A *ridotto* commonly takes place on fast-eve, in those places where the carnival is celebrated.

Ridotto, in Venice, is also the name of a public place, where, during the carnival, games of hazard, particularly faro, are played. Formerly, none but a Venetian noble could have a bank in the *ridotto*, and particular privileges were granted to him as banker. On each side stood a lady in a mask, to give him warning of any thing to his disadvantage. No persons but nobles were permitted to play unless in a mask.

RIED, TREATY AT, Oct. 8, 1813. See *Bavaria*.

RIEDESEL, Frederica Charlotte Louisa, baroness, the daughter of the Prussian minister of state Massow, was born at Brandenburg in 1746. At the age of sixteen, she was married to lieutenant-colonel Riedesel, who commanded the Brunswick troops employed in the British service in America in 1777. Madam Riedesel, who accompanied her husband, wrote an interesting account of her adventures, published by her son-in-law, the count de Ruess, under the title of Voyage to America, or Letters of Madame von Riedesel (translated into English, New York, 1827). She returned to Europe in 1783; and having lost her husband (who had been made a general) in 1800, she fixed her residence at Berlin, where she died in 1808.

RIEGO Y NUNEZ, Rafael del, a Spanish patriot, was born of a noble family, in the province of Asturias, in 1785. After having been liberally educated, he entered the army, and served during the invasion of Spain by Bonaparte. He was taken prisoner; and, on his liberation, the constitutional general Abisbal gave him a staff appointment; and when that chief betrayed the cause of independence, Riego retired from the service in disgust, and for time led a private life. In the beginning of 820, at the head of a battalion, he proclaimed the Spanish constitution, and, traversing a large extent of country, shut himself up in a fortress, with the small number of troops who had the patriotism and courage to follow his example. Being threatened by a powerful army, and aware of the danger of delay, he sallied forth from the isle of Leon with a few hundred brave men, made his way through the forces that opposed his passage, visited several large towns, intimidated the authorities, fought obstinately, lost the greater part of his troops, and retired to the mountains with the determination to defend himself to the last extremity, rather than submit to the mercy of his enemies. But the spirit of freedom which he had excited was not extinguished; the provinces ranged themselves under the banners of independence, and Riego received the homage of national gratitude. His popularity excited the jealousy of those in power, and he was calumniated as a promoter of anarchy and disorder: his army was dissolved, and he was proscribed. But he preserved the confidence of the people, and was appointed a deputy to the cortes of 1822, of which assembly he became the president, and in this arduous station displayed prudence and firmness, with a conciliatory disposition that did him honour. When king Ferdinand refused to maintain the constitution which he had sworn to observe, Riego again appeared in arms to assert the liberty of his country; but it was destined to fall before foreign foes. He was taken prisoner after the surrender of Cadiz to the French, under the duke d'Angouleme, and, being conveyed to Madrid, was executed as a traitor, Nov. 7, 1823. His widow, who sought refuge in England, died at Chelsea, June 19, 1824.—See the *Memoirs of the Life of Riego*, by the canon Riego (London, 1824), and Matthew's *Narrative*, &c.

RIENZI, NICHOLAS GABRINI DE; a native of Rome, who, in the fourteenth century, became celebrated by his attempts to restore the Roman republic. Although the son of one of the lowest order of tavern keepers, he received a literary education, and early distinguished himself by his talents, parts, and elevated sentiments. The glory of ancient Rome excited his enthusiasm, and he came to be regarded by the common people as an extraordinary person, destined to rescue them from the tyranny of the aristocracy, which on the removal of the popes to Avignon, had become in the highest degree insolent and oppressive. He obtained the post of public scribe or notary, and in 1346 was joined in a deputation to pope Clement VI, at Avignon, to exhort him to bring back the papal court to its original seat. He acted on this occasion with so much engery and eloquence, that the pope created him an apostolic notary, which office, on his return, he executed with strict probity. He let no opportunity escape to excite the discontent of the people, by haranguing against the nobility and the defects of the public administration. Having prepared men's minds for a change, and engaged persons of all orders in his designs, in the month of April, 1347, during the absence of the governor of Rome, Stephen Colonna, he summoned a secret assembly upon mount Aventine, before which he made an energetic speech, and induced them all to subscribe an oath for the establishment of a plan of government, which he entitled the *good estate*. He had even the address to gain over the pope's vicar, and, in a second assembly in the capitol, produced fifteen articles as the basis of the good estate, which were unanimously approved; and the people conferred upon him the title of *tribune*, with the power of life and death, and all the other attributes of sovereignty. The governor, Colonna, upon his return, threatened him with punishment, but was himself contrained to quit the city; and Rienzi banished several of the noble families, after capitally punishing such as were convicted of oppression and injustice. In the first exercise of his authority, he conducted himself with a strict regard to justice and the public good; and even the pope was induced to sanction his power. The reputation of the new tribune extended throughout Italy, and his friendship was even solicited by the king of Hungary and the emperor Louis. Petrarch was highly interested in his proceedings; and there are extant several eloquent letters, in which that poet exhorts him to persevere in his glorious undertakings. But the intoxication of supreme power began to betray him into extravagances. He caused himself to be created a knight, with a mixture of religious and military ceremonies, and cited the two rival emperors, Charles and Louis, to appear before him to justify their pretensions. He also dismissed the pope's legate, and, reducing the nobles into complete humiliation, commenced a reign of terror. But at length finding that he had lost the affection and confidence of the people, he withdrew, in 1348, from Rome, and remained in Naples until 1350, when he took advantage of the jubilee to return secretly to Rome; but being discovered, he withdrew to Prague. Thence he came into the hands of pope Clement at Avignon, who confined him three years, and appointed a commission to try him; his successor, Innocent VI., released Rienzi, and sent him to Rome to oppose another popular demagogue, named Boroncelli. The Romans received him with great demonstrations of joy, and he recovered his former authority; but after a turbulent administration of a few months, the nobles excited another sedition against him, in which he was massacred in October, 1354. His last brief career had been marked with great cruelty, which excited the populace to treat his remains with indignity. Rienzi, who possessed a union of fanaticism and artifice, was more energetic in speech and council than in action, and failed in courage and presence of mind in great emergencies.

RIESENGEBIRGE (the Giants' mountains); part of the Sudetic chain, separating Silesia from Bohemia and Moravia, till it joins the Carpathians; but the term is properly applied to that part of this range which lies between the sources of the Neisse and the Bober. It contains the loftiest mountains of the north or central parts of Germany. Some of the principal summits are Schneekoppe, 5270 feet high; Great Sturmhaube, 5030 feet high; and Lesser Sturmhaube, nearly as high. The valleys of the Riesengebirge present many picturesque scenes. See *Sudetic Mountains*.

RIFACIMENTO (*Italian*, a remaking, or re-establishment) is now often used in English. One of its most common applications is to the process of recasting literary works, so as to adapt them to a changed state of circumstances; as when a work written in one age or country is modified to suit the circumstances of another. The German word *Umarbeitung* is still more impressive.

RIFLE; a fire-arm which has the inside of its barrel cut with from three to nine or ten spiral grooves, so as to make it resemble a female screw, varying from a common screw only in this, that its grooves or rifles are less deflected and approach more to a right line; it being now usual for the grooves with which the best rifled barrels are cut, to take about one whole turn in a length of thirty inches. The number of these grooves differ according to the size of the barrel, and the fancy of the workman; and their depth and width are not regulated by any invariable rule. The period of their invention cannot be precisely determined. In 1381, the city of Augsburg promised, in the war of the free imperial cities against the nobility in Franconia, Suabia and Bavaria, to send thirty rifles (*busses*, *buchsen*) to the army. In 1498, fire-arms with rifled barrels were used at a public shooting-match in Leipsic.

RIGA; a fortified city in the Russian government of the same name (see *Livonia*), lying on the Duna, or Dwina, seven miles above its entrance into the gulf of Riga; lat. 56° 57′ N.; lon. 24° 5′ E. The suburbs, which were almost entirely destroyed in 1812 (see *Russian-German War*) have since been rebuilt with broad, handsome streets, and numerous public walks and squares. The city has also received many additions and ornaments of late. The population, which, in 1821, amounted to 41,500, was, in 1828, 55,547, principally Lutherans. In 1829, 1403 vessels entered the port of Riga; the exports for the same year amounted to 47,888,000 roubles. The commerce is principally carried on by British merchants. There are numerous public institutions and buildings here, among the latter of which are the magnificent town-house, an imperial palace, the old castle, &c. The inhabitants are chiefly Germans, or of German origin. Next to Petersburg, Riga is the most important commercial place in the empire, and has large naval establishments. Corn, flax and hemp are the chief articles of export. Riga was founded in 1200, by bishop Albert, and, until the middle of the sixteenth century, belonged to the Teutonic knights. In 1710, it was taken possession of by Russia.

RIGADOON; a lively kind of dance, performed in figure by a man and woman, and the tune of which is always written in triple time. The rigadoon was borrowed originally from Provence. The word is formed from the French word *rigaudon*, signifying the same thing.

RIGGING; a general name given to all the ropes employed to support the masts, and to extend or reduce the sails, or arrange them to the disposition of the wind.—*Standing rigging* is that which is used to sustain the masts, and remains in a fixed position; as the shrouds, stays, and back-stays.—*Running rigging* is that which is fitted to arrange the sails by passing through various blocks, in different places about the masts, yards, shrouds, &c., as the braces, sheets, halliards, clew-lines, &c., &c.

RIGHI, or RIGI (*Mons Regius*, or *Regina montium*); an isolated mountain in the canton of Schweitz, between the lakes of Zug, Lucerne and Lowertz, 6000 feet high. The view from the summit is remarkably fine, and attracts great numbers of travellers; it embraces the whole of the north and east of Switzerland, far into Swabia, the Jura, the Alps to the Jungfrau, and fourteen lakes. Fussli and Meyer published the finest views in the Sketches on the Righi (Zurich, 1807).

RIGHT AND LEFT BANK OF A RIVER. That bank which is on the right of a person looking down the river is called the *right* bank; the other the *left*.

RIGHT, Petition of. See *Petition of Right.*

RIGHTS, Bill of. See *Bill of Rights.*

RIGHTS, Declaration of. See *Bill of Rights.*

RIMINI (Ariminum); a city in the States of the Church, on the Marecchia, near its entrance into the gulf of Venice; lat. 44° 4′ N., lon. 12° 34′ E. There is a harbour at the mouth of the Marecchia, which, however, is choked up by sand and stones, brought down by the river. The sea has receded more than two miles from the ancient light-house, which is now surrounded by gardens. The river is crossed by a handsome marble bridge, of five arches, built by Tiberius, at the point where the Flaminian and Æmilian ways met, and is the finest monument of antiquity of the kind. Before one of the gates is an ancient triumphal arch, erected in honour of Augustus. The cathedral erected on the ruins of the temple of Castor and Pollux is, like several of the other churches, built of the marble taken from the ruins of the old port. The church of S. Francesco, built in the midde of the fifteenth century, is celebrated for its noble and splendid style of architecture. It was erected by Pandolfo Malatesta, whose family governed Rimini for a long period in the middle ages, and adorned the city with many public buildings. In the *Piazza del Commune* is a handsome fountain, and a bronze statue of pope Paul V.; in the market-place is shown a pedestal from which it is pretended that Cæsar harangued his troops before passing the Rubicon. Rimini contains some other fine remains of antiquity. March 25, 1831, it was occupied by Austrian troops, after having been some time defended by Italian patriots.

RING. For the pope's ring, see *Fisherman's Ring*; for the bishop's, see *Investiture*, also [illegible]; for Saturn's ring, see *Planet* and *Saturn*. See also *Fairy Circle.*

RIO BRAVO DEL NORTE. See *Norte.*

RIO DE JANEIRO, or S. SEBASTIANO (often called simply *Rio*); capital city of Brazil, on the western shore of the bay of the same name, which makes up from the Atlantic ocean; lat. 22° 54′ S., lon. 43° 15′ W.; population in 1820, estimated at 135,000, and by Walsh, in 1830, at 150,000. Before the arrival of the Portuguese court, in 1808, the population was about 50,000, and occupied only that part of the city now called the *old city*. The streets of the new city are broad and straight, and the houses in both sections are mostly built in the same style, of granite, and three stories high. The public places are not remarkable for beauty; but most of them have fountains supplied with water by a very handsome aqueduct. The imperial palace, formerly the residence of the viceroys, is built in an ordinary style, and was enlarged, after the arrival of the court, by connecting it with the Carmelite monastery. The mint, the custom-house, the arsenal, and the exchange, are handsome buildings. The churches and convents (five) present nothing deserving of notice. The public gardens are prettily laid out, and enjoy a fine prospect. Music is a favourite amusement of the people, and is cultivated with success by all classes. The manufacturing industry is inconsiderable; but Rio is the great mart of Brazilian commerce; the harbour is one of the finest and safest in the world. All the ports, between Bahia on the north and Montevideo on the south, send their merchandise to Rio for exportation or consumption. The internal commerce with the inland provinces is also extensive, particularly in mineral riches. Sugar, coffee, cotton, tobacco, hides, tallow, furs, molasses, indigo, fustic, cocoa-nuts, diamonds, topaz, and other precious stones, are among the exports. (See *Brazil.*) The climate is warm and humid; and, on account of the marshes which surround the city, and the filth of the streets, the vultures being the only scavengers, the city is often an unhealthy residence for strangers; but, by adopting the Brazilian mode of living, avoiding exposure in the sun, night dews, abstaining from spirituous liquors, and using vegetable diet, the danger is averted. The population consists of a singular mixture of colours and nations; about two thirds are negroes, mulattoes,

; and among the whites are seen French, Ger-ns, English, Italians, Dutch, and North Ameri-s. The environs are charming, and vegetation er ceases. The place derives its name signify-g *river of January*, from the mistake of the first overer of the bay, who conceived it to be the uth of a large river. It was founded by the rtuguese in 1565, and in 1763 was made the capi-l of Brazil. It was the residence of the Portu-ese court from 1808 to 1821, and, in 1822, became e capital of the independent empire of Brazil. In 331 (April 7), it was the theatre of a revolu-on, in which 6000 armed citizens were joined y the troops of the line in their opposition to the overnment, and in consequence of which Dom edro abdicated the throne in favour of his son, edro II.—See Walsh's *Notices of Brazil* (London, 830.)

RIO GRANDE. See *Plata, La.*

RIOTS are disturbances of the public peace, ttended with circumstances of tumult and commo-ion, as where an assembly destroys, or in any man-er damages, seizes or invades the property either f individuals or the public, or does any injury to he persons of individuals, or invades, seeks, or pursues them, with intent to confine them, or put them in fear, or violently constrains any one to act contrary to his interest, duty, or inclination. Where three or more persons assemble on their own authority to disturb the public peace whether in a house or highway, with intent mutually to assist each other against any who shall oppose them in the execution of some enterprise of a private nature, and they afterwards actually execute the same, in a violent and turbulent manner, to the terror of the people, whether the act be lawful or not, they incur the guilt of a riot. All who are actually engaged in a riot are considered, in law, as equally guilty of the offence; but the circumstances of each are to be considered in assigning his punishment.

RIPON, a borough and market-town of England, in the west riding of Yorkshire, situated 212 miles N. N. W. from London, between the river Ure and the Skill, near the confluence of those streams, and hence its name, from its site (*in ripis*) on the banks of the rivers. It was anciently the see of a bishop, and it is now a deanery in the patronage of the crown. Here was a college of prebendaries before the Reformation, which was refounded in 1604, by James I.; and the present establishment consists of a dean, a sub-dean, and six prebendaries, with inferior officers. The living is a perpetual curacy in the peculiar jurisdiction of the archbishop of York, and in the patronage of the dean and chapter of Ripon. The church, which is dedicated to St Peter and St Wilfred, is a spacious cruciform structure, with a square tower in the centre, and one at each angle of the west end. There is another church, dedicated to the Holy Trinity, built in 1826 and 1827, by the Rev. Edward Kilvington, at the expense of £13,000. It is a handsome freestone edifice, in the later pointed style of architecture, with a tower and spire; it is called the Tron church, and the living is in the patronage of the founder. Here are places of worship for Independents, and for Wesleyan and Primitive Methodists, besides free schools and hospitals. Ripon was formerly famous for the manufacture of spurs and that of woollen cloth, both of which are extinct; at present the principal articles of commerce produced here are linens, saddle-trees, and malt. The river Ure was made navigable to Ripon, under the authority of an act of Parliament passed in 1767, and another act was obtained in 1820, incorporating the proprietors of this navigation, which affords a communication with Hull, York, and other towns. A weekly market for wool is held here during the season.

The parish, the borough, and the liberty of Ripon, do not concide in their respective limits. The parish comprises five chapelries and twenty-one townships within the liberty, and two chapelries and five townships without the liberty; while the liberty not only includes part of the parish of Ripon, but also certain townships in the parishes of Felix-Kirk, Kilburn, and Marton. Population of parish of Ripon in 1831, 14,804; of liberty, 12,880; of borough and town, 5,080.

RIPPERDA, John William, baron of, born in 1680, of a noble family in Groningen, was educated under the Jesuits of Cologne, but, on marrying a Protestant lady, conformed to her religion. He rose to the rank of colonel in the Dutch service, and in 1715 was sent on a mission to Philip V. of Spain, when he returned to the Catholic religion, and settled at Madrid; and the king finally made him duke of Ripperda, and his prime minister; but, from his inefficiency, incurring the displeasure of the king, he was dismissed, and confined in the castle of Segovia, whence he escaped and went to England, where he remained until 1730, when he crossed over to the Hague, and resumed the Protestant religion. But his restless and ambitious disposition would not allow him to remain tranquil, and in 1731 he went to Morocco, where he was favourably received by Muley Abdalla, and declaring himself a convert to the Mahommedan religion, and taking the name of Osman, he obtained the chief command of the Moorish army at the siege of Ceuta. On the defeat of the Moors, he fell under the displeasure of the emperor, and for a time he lived in retirement. He then formed a new project for the consolidation of different religions, particularly the Jewish and Mahommedan; and it is said that he even made some converts. He finally retired to Tetuan; but his projecting spirit animated him to the last, and he advanced considerable sums to Theodore, baron Neuhof, to assist his attempts on the crown of Corsica. His death took place in 1737. See Moore's *Life of the Duke of Ripperda* (1806).

RIP-RAPS. See *Dover, Straits of.*

RIPUARIA, Lex. The *Loi des Ripuaires* was a collection of laws like the Salic law for the Franks. The latter is supposed to have been the code of those Franks who lived between the Meuse and Loire, and the Ripuarian law that of those who lived between the Meuse and the Rhine. It was drawn up under king Theodoric, at Châlons-sur-Marne. Its spirit is barbarous, like that of the Salic law.—*Ripuarii* was a collective name given by the Romans to all the various tribes of Franks who inhabited the country from the river Lahne to the Lippe, along the Rhine.

RITORNELLO (*Italian*), in music; a passage which is played whilst the principal voice pauses; it often signifies the introduction to an air or any musical piece. This *ritornello* is often repeated after the singing voice has concluded; hence the name. In Italian operas, the *ritornelli* are often unduly prolonged.

Ritornelli are also popular songs of three lines each, sung in the Italian mountains, which are also used by the *improvisatori*. The metre and number of the syllables are not subject to rule. The first line, however, is generally the shortest.

RITTENHOUSE, David, a distinguished American astronomer, was born near Germantown, Pennsylvania, April 8, 1732. During his early years, he was employed on his father's farm; yet, even there, his peculiar genius manifested itself.

His younger brother used to say, that while David was employed in the fields, he repeatedly observed the fences, and even the plough with which he had been working, marked over with mathematical figures. The construction of a wooden clock exhibited the first evidence of his mechanical talents. With little time at his command, with but two or three books, and without the least instruction, he acquired so considerable a knowledge of the mathematical sciences, as to be able to read the *Principia* of Newton. He also planned and executed an instrument, in which his mathematical knowledge, and his mechanical skill, were equally required. This instrument was an *orrery*. Two orreries were made by his own hands. One belongs to the university of Pennsylvania; the other to the college of Princeton. In 1769, he was named one of the committee, appointed by the American philosophical society, to observe the transit of Venus over the sun's disk, which happened June 3 of that year. In 1779, he was appointed by the legislature of Pennsylvania, one of the commissioners for adjusting a territorial dispute between that state and Virginia; and the success of this commission is ascribed, in a great degree, to his skill and prudence. In 1786, he was employed in fixing the northern line, which divides Pennsylvania from New York. In 1769, he was employed in settling the limits between New York and New Jersey; and, in 1787, he was called upon to assist in fixing a boundary line between the states of Massachusetts and New York. Mr Rittenhouse was elected a member of the American academy of arts and sciences, at Boston, in 1782, and of the royal society of London, in 1795. In 1791, he was chosen the successor of doctor Franklin, in the presidency of the American philosophical society. All his philosophical communications were made through the medium of the Transactions of this society, and the list of his papers, printed in the three first volumes, shows his zeal for science and the fertility of his genius. In 1777, doctor Rittenhouse was appointed treasurer of Pennsylvania, in which office he continued until 1789. In 1792, he was appointed, by the general government, director of the mint of the United States. The mechanical skill of doctor Rittenhouse rendered him a highly useful officer. In 1795, he was obliged to resign in consequence of the state of his health. His constitution, naturally feeble, had been rendered still more so by sedentary labour and midnight studies, and he died on the twenty-sixth of June, 1796. Immediately after his decease, the American philosophical society decreed him the honour of a public eulogium; and this duty was executed in the ablest manner by doctor Rush. In 1813, a large volume of memoirs of his life was published by his relative, William Barton.

RITTER, John William, a distinguished natural philosopher, was born in 1776, at Samitz, near Hanau, in Silesia, and died, in 1810, in Munich. He distinguished himself by the study of galvanism; but excessive labour, exhausting experiments, a bad wife, and consequent intemperance, brought him early to the grave. His works, which are of uncommon importance, as far as galvanism is concerned, are, Contributions to the better understanding of Galvanism (Jena, 1801, 2 vols.); Proof that a continual Galvanism accompanies the Process of Life (Weimar, 1798); Physico-Chemical Treatises (Leipsic, 1806, 3 vols.); Fragments of the Papers of a young Philosopher (Heidelberg, 1810, 2 vols.); all in German. He contributed many articles to Gilbert's Annals of Physics, and Voigt's Magazine of Natural Science.

RITZEBUTTEL; a bailiwick under the jurisdiction of Hamburg, between the mouths of the Elbe and Weser, with 3900 inhabitants. In this place is Ritzebuttel, a borough, one mile south of Cuxhaven; lat. N. 53° 52′ 8″; lon. E. 8° 4 It has 1500 inhabitants. Travellers wait here to embark at Cuxhaven.

RIVERS are to be traced to springs, or to the gradual meltings of the ice and snow which perpetually cover the summits of all the most elevated ranges of mountains upon the globe. The union of the various springs, or of these meltings, forms rivulets; these last follow the declivity of the ground, and commonly fall, at different stages, into one great channel, called a *river*, which, at last, discharges its waters into the sea, or some great inland lake. The declivities along which descend the various streams that flow into one particular river are called its *basin*—a term, therefore, which includes the whole extent of country from which the waters of the river are drawn. As mountainous regions abound in springs, we find that most rivers, and especially those of the first class, commence from a chain of mountains; each side of a chain has its springs, and the rivers which originate on one side flow in the opposite direction to those which rise on the other. As it is the property of water to follow the most rapid descent that comes in its way, the courses of streams point out the various declivities of the earth's surface, and the line from which large rivers flow in contrary directions (German *Wasserscheide*), generally marks the highest parts of the earth. In European Russia, where the rivers are very extensive, there is, however, a singular exception to this rule, the line which separates the sources of those rivers being very little above the level of the Baltic, or of the Black sea.

It has been observed, by some writers, that the extent of a river is in proportion to the height of the range of mountains from which it descends. This is, in a certain degree, true, because the greater the bulk of the mountains, the more numerous the springs and torrents which they furnish; but the relation between the extent of a river and the surface of its basin is much closer and more invariable. Even this is not sufficiently comprehensive; for it is evident that the size of a river depends upon three circumstances—the surface of its basin; the abundance, or otherwise, of that surface in springs; and the degree of humidity possessed by the climate of the region from which it draws its supplies. As many springs, however, are formed by the rains, the second of these circumstances will, in some measure, vary with the last. By an attention to these remarks, the causes of the great size of the South American rivers will be apparent. The peculiar position of the Andes, with respect to the plain of that continent; the fact, that by very far the largest proportion of its running waters are drained off in one general direction (towards the Atlantic); the multiplicity of streams that intersect the country; and the humidity of the climate—all contribute to that result. The Andes being placed so near the coast of the Pacific, the rivers which flow from them into that ocean are small; while those which flow on the other side, having such an immense space to traverse, are swelled into a most majestic volume before they reach the Atlantic. The physical circumstances of the old continent are unfavourable to the accumulation of such vast bodies of water as the rivers of South America. Europe is not of sufficient extent; Africa is oppressed by a scorching climate, and abounds in sandy deserts; in Asia, the atmosphere generally is not so moist, while the more central position, for the most part of the great mountainous range of that continent, and the existence of capacious inland lakes, which are the final receptacles of the streams that fall into them, are the causes why the waters are more equally drained off in different directions than in the New World.

When water, by following a descent, has once received an impulse, the pressure of the particles behind upon those before will be sufficient to keep the stream in motion, even when there is no longer a declivity in the ground. The only effect is, that in passing along a level, the course of the stream becomes gradually slower—an effect which may be perceived, more or less, in all running waters that originate in mountainous or hilly tracts, and afterwards traverse the plains. The declivity of many great rivers is much less than might at first be supposed. The Maranon, or Amazons, has a descent of only ten and a half feet in 200 leagues of its course; that is, one twenty-seventh part of an inch for every thousand feet of that distance. The Loire, in France, between Pouilly and Briare, falls one foot in 7500, but between Briare and Orleans, only one foot in 13,596. Even the rapid Rhine has not a descent of more than four feet in a mile, between Schaffhausen and Strasburg, and of two feet between the latter place and Scheuckenschantz. When rivers flow through a mountainous and rugged country, they frequently fall over precipices, and form *cataracts*, in some cases, several hundred feet in depth. The most celebrated falls in the world are those of the Niagara, in North America.

In the tropical regions, most of the rivers are subject to periodical overflowings of their banks, in consequence of the rains which annually fall in such abundance, in those countries, during the wet season. The overflow of the Nile was considered by the ancients, who were ignorant of its cause, as one of the greatest mysteries of nature; because, in Egypt, where the overflow takes place, no rain ever falls. The apparent mystery is easily explained, by the circumstance of the rains descending upon the mountains in the interior of Africa, where the Nile rises. The consequent accumulation of the waters among the high grounds, gradually swells the river along its whole extent, and, in about two months from the commencement of the rains, occasions those yearly inundations, without which Egypt would be no better than a desert.

The disappearance of some rivers, for a certain distance, under ground, is accounted for with equal facility. When a river is impeded in its course by a bank of solid rock, and finds beneath it a bed of a softer soil, the waters wear away the latter, and thus make for themselves a subterraneous passage. In this way are explained the sinking of the Rhone, between Seyssel and L'Ecluse, and the formation, in Virginia, of the magnificent rock bridge which overhangs the course of the Cedar creek. In Spain, the phenomenon exhibited by the Guadiana, which has its waters dispersed in sandy and marshy grounds, whence they afterwards emerge in greater abundance, is to be referred to the absorbing power of the soil.

Rivers, in their junction with the sea, present several appearances worthy of notice. The opposition which takes place between the tide and their own currents, occasions, in many instances, the collection at their mouths of banks of sand or mud, called *bars*, on account of the obstruction which they offer to navigation. Some streams rush with such force into the sea, that it is possible, for some distance, to distinguish their waters from those of the sea. The shock arising from the collision of the current of the majestic Amazons with the tide of the Atlantic is of the most tremendous description. (See *Mascaret*.) Many of the largest rivers mingle with the sea by means of a single outlet, while others (for instance, the Nile, the Ganges, the Volga, the Rhine, and the Orinoco), before their termination, divide into several branches.[*] This circumstance will depend upon the nature of the soil of the country through which a river runs; but it also frequently results from the velocity of the stream being so much diminished in its latter stage, that even a slight obstacle in the ground has power to change its course, and a number of channels are thus produced. Another cause may be assigned for the division into branches of those rivers which, in tropical countries, periodically inundate the plains; the superfluous waters which, at those periods, spread over the country, find various outlets, which are afterwards rendered permanent by the deepening of the channels by each successive flood. In some of the sandy plains of the torrid zone, the rivers divide into branches, and, from the nature of the soil and the heat of the climate, they are absorbed and evaporated, and thus never reach the sea. See the articles *Amazons*, *Plata*, *Mississippi*, *Missouri*, *Lawrence, St.*, *Danube*, *Rhine*, *Nile*, *Niger*, *Ganges*, &c.

RIVOLI; a village in the Lombardo-Venetian kingdom, five leagues north-west of Verona, between lake Garda and the right bank of the Adige, near the imperial road leading from Trent to Verona, with 535 inhabitants, famous for a bloody battle between Bonaparate and the Austrians, on January 14 and 15, 1797, which decided the fate of Italy. After the Austrian general Alvinzi had been forced back to Verona, Napoleon turned and followed general Provera, beat him on the 15th at La Favorite, and made 6000 prisoners. On these two days, the French took above 20,000 prisoners and forty-six cannons. Thus the fourth Austrian army in Italy was almost entirely destroyed. The fall of Mantua was a consequence. Masséna distinguished himself greatly on this occasion, and Napoleon subsequently made him duke of Rivoli. Napoleon gives a description of the battle in his *Mémoires* (t. iv., p. 331 et seq.)

RIVOLI, DUKE OF. See *Masséna*.

RIX DOLLAR; a silver coin in different countries on the continent, and of different values. See *Coins*.

RIZZIO, OR RICCI, DAVID; the son of a professor of music and dancing at Turin, where the subject of this article was born, in the earlier part of the sixteenth century. His musical abilities procured him notice at the court of Savoy, while his talents as a linguist caused him to be selected by the ambassador from the grand-duke to Mary queen of Scots, as a part of his suite. In 1564, he first made his appearance at Holyrood house, where he soon became so great a favourite with the queen, that he was appointed her secretary for foreign languages. (See *Mary Stuart*.) The distinction with which he was treated by his mistress, soon excited the envy of the nobles, and the jealousy of Darnley; the hatred of the former being increased as much by the religion as by the arrogant deportment of the new favourite, while the suspicions of the latter were excited by his address and accomplishments. A conspiracy, with the king at its head, was formed for his destruction, and before he had enjoyed two years of court favour, the lord Ruthven, and others of his party, were introduced by Darnley into the queen's apartment, where they despatched the object of their revenge by fifty-six stabs, in the presence of his mistress, in 1566. Popular tradition assigns to Rizzio the amelioration of the Scottish style of music. His skill in the performance of the national melodies on his favourite instrument, the lute, tended not a little to their general improvement and popularity with the higher classes; but it is evident that the style of Scottish music was determined long before the time of Mary; and many of the airs which have been ascribed to Rizzio are easily traced to more distant periods.

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[*] The triangular space formed by a river pouring itself into the sea by various mouths, is called a *Delta*, from its resemblance to the shape of the fourth letter (Δ) of the Greek alphabet.

ROADS. Roads intended for the passage of wheel carriages are made more level, and of harder materials, than the rest of the ground. In roads the travel on which does not authorize great expense, natural materials alone are employed, of which the best are hard gravel and very small stones. The surface of roads should be nearly flat, with gutters at the sides, to facilitate the running off of water. If the surface is made too convex, it throws the weight of the load unequally upon one wheel, and also that of the horses on one side, whenever the carriage takes the side of the road. Hence drivers prefer to take the middle or top of the road, and, by pursuing the same track, occasion deep ruts. The prevention of ruts is best effected by flat and solid roads, and by the use of broad wheels. It would also be further effected if a greater variety could be introduced in the width of carriages. Embankments at the sides, to keep the earth from sliding down, may be made by piling sods upon each other, like bricks, with the grassy surface at right angles with the surface of the bank. But stone walls are preferable for this purpose, when the material can be readily obtained.

Pavements. Pavements are stone coverings of the ground, chiefly employed in populous cities and the most frequented roads. In Milan, and some other places, tracks for wheels are made of smooth stones, while the rest of the way is paved with small or rough stones. (See *Pavements.*) The advantage of a good pavement consists not only in its durability, but in the facility with which transportation on it is effected. Horses draw more easily on a pavement than on a common road, because no part of their power is lost in changing the form of the surface. The disadvantages of pavements consist in their noise, and in the wear which they occasion of the shoes of horses and tires of wheels. They should never be made of pebbles so large as to produce much jolting by the breadth of the interstices.*

M'Adam Roads. The system of road-making which takes its name from Mr M'Adam combines the advantages of the pavement and gravel road. The M'Adam roads are made entirely of hard stones, such as granite, flint, &c., broken up with hammers into small pieces, not exceeding an inch in diameter. These fragments are spread upon the ground to the depth of from six to ten inches. At first the roads thus made are heavy and laborious to pass, but in time the stones become consolidated, and form a mass of great hardness, smoothness and permanency. The stones become partly pulverized by the action of carriage wheels, and partly imbedded in the earth beneath them. The consolidation seems to be owing to the angular shape of the fragments, which prevents them from rolling in their beds, after the interstices between them are filled. Mr M'Adam advises that no other material should be added to the broken stones, apparently with a view to prevent the use of clay and chalk, which abound in England. It appears, however, that a little clean gravel spread upon the stones, causes them to consolidate more quickly, and has the good effect of excluding the light street-dirt, which otherwise never fails to become incorporated, in large quantities, among the stones.

ROANOKE, a river of North Carolina, is formed by the union of the Staunton and Dan, the former of which rises in Virginia, and the latter in North Carolina. It flows into Albemarle sound, lat. 35° 58′ N., and is navigable for vessels of considerable burden forty or fifty miles, for large boats, seventy miles, and for boats of five tons, 270 miles. Improvements have been made, by constructing canals around the falls, and opening a water communication between Norfolk and the interior of North Carolina. The soil on the borders of the Roanoke is very productive.

ROASTING JACK. See *Jack.*

ROBBERY; a felonious and forcible taking away another man's goods or money from his person, presence or estate, by such acts as put him in fear, &c. The previous putting in fear is the criterion which distinguishes robbery from other larcenies; yet this does not imply any great degree of affright in the person robbed: it is sufficient that so much force or threatening, by word or gesture, is used, as might create an apprehension of danger, so as to lead a man to part with his property against his consent. If a man be knocked down without previous warning, and stripped of his property while senseless, though strictly speaking, he cannot be said to be put in fear, yet this is undoubtedly a robbery; or if a person with a sword drawn beg alms, and money is given him through apprehension of violence, this is a robbery. If a thief, having once taken a purse, returns it, still it is a robbery. Highway robbery, or the forcible taking of property from travellers, in many countries, is a capital offence, and, in all civilized countries, is severely punished.

ROBERT I. See *Bruce, Robert.*

ROBERTSON, William, the celebrated historian, was born at Borthwick, in East Lothian, where his father was minister, in 1721. In 1733 his father removed to Edinburgh, as minister of the Greyfriars in that city. After the completion of his course in the theological class of Edinburgh, Robertson obtained a license to preach, in 1741, and, in 1743, was presented to the living of Gladsmuir, in East Lothian. He soon began to be distinguished by his eloquence and good taste as a preacher, and became known as a powerful speaker in the general assembly of the church of Scotland, in which he obtained an ascendency by his eloquence and great talents for public business, which, exerted on the side of authority, gave him, for a long time, the lead in the ecclesiastical politics of Scotland. His History of Scotland, during the Reigns of Queen Mary and King James VI, appeared in 1759 (2 vols., 4to.), and was received with general applause. In this praise no one more heartily concurred than Hume, between whom and doctor Robertson, notwithstanding religious and political differences, an intimate friendship was maintained through life. The distinction acquired by this work, which reached a fourteenth edition before his death, led to the author's nomination as chaplain of Stirling castle in 1759, one of the king's chaplains in 1761, and principal of the university of Edinburgh in 1762. Two years after, he was made historiographer royal of Scotland, with a salary of £200 per annum. As head of a flourishing seat of education, he was attentive to all his duties, and co-operated with the greatest liberality in all the improvements which have raised Edinburgh to its present celebrity. His History of the Reign of Charles V. appeared in 1769 (3 vols., 4to.), and his History of America in 1777 (2 vols., 4to.) His latest work appeared in 1791, under the title of an Historical Disquisition concerning the Knowledge which the Ancients had of India, and the Progress of Trade with that Country prior to the Discovery of the Cape of Good Hope (4to.) Doctor Robertson died in 1793. As a historian, he is admired for skilful and luminous arrangement, distinctness of narrative, and highly graphical description. His style is pure, dignified, and perspicuous. See the Account of his Life and Writings by Dugald Stewart.

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* Mr Telford constructed, in England, a kind of paved road, in which the foundation consists of a pavement of rough stones and fragments, having their points upwards. These are covered with very small stone fragments and gravel, for the depth of four inches, the whole of which, when rammed down and consolidated, forms a hard, smooth and durable road.

ROBESPIERRE, Maximilian Isidore, was born at Arras, in French Flanders, in 1759, and was the eldest son of an advocate of the superior council of Artois. His father dying when he was young, he was indebted for his education to the bishop of Arras, who gave him an exhibition at the college of Louis le Grand, at Paris. He completed his youthful studies in a manner creditable to his talents and application, and, at this period, is said to have derived an attachment to republicanism from the lessons of one of his tutors, M. Hérivaux, who was an enthusiastic admirer of the heroes of ancient Greece and Rome. In 1775, when Louis XVI., after his accession to the crown, made his entry into Paris, Robespierre was deputed by his fellow students to present their homage to the new sovereign. Having adopted the law as a profession, he became an advocate of the council of Artois. Previously to the revolution, he was advantageously known, both on account of his professional abilities, and the liberal and enlightened spirit which he exhibited in his conduct and writings. In 1789, he was elected a deputy from the *tiers état* of the province of Artois to the states-general. In that assembly, he advocated the liberty of the press, and other popular topics of discussion; but his eloquence did not attract much attention, and he attached himself, in the first instance, so closely to Mirabeau, that he acquired the epithet of *Le Singe de Mirabeau*. At this time, however, he frequented the Jacobin assemblies and clubs of the lower orders, over whom he gained an ascendency, of which he afterwards availed himself to make his way to despotic power. In January, 1791, he spoke repeatedly on criminal legislation; and he subsequently displayed so much moderation in discussions relative to the emigrants and the priests, as led to suspicions that he was actuated by some secret motives. In a speech on the 30th of May, he recommended the abolition of capital punishments. He is said to have been much alarmed at the flight of the king from Paris, and equally rejoiced at his forced return from Varennes; and, from that period, he seems to have used all his influence in overturning the monarchy. His projects now gradually became developed; and, at the tumultuary meeting in the Champ de Mars, July 17, an altar, with the inscription, *A celui qui a bien merité de la Patrie*, and below it the name of *Robespierre*, testified his high favour with the people. The closing of the constituent assembly, Sept. 30, afforded him another triumph, when the mob presented him with a garland of oak leaves, and, taking the horses from his carriage, drew him through the streets, exclaiming, "Behold the friend of the people, the great defender of liberty!" It does not appear that he actively interfered in the riot of Aug. 10, 1792, or in the massacres which took place in the prisons of Paris, in the beginning of September; but he was connected with Marat and Danton, of whose crimes, and those of their associates, he had sufficient address to reap the fruits, and, like other tyrants, at length made his instruments his victims. After the execution of the king, in promoting which the Brissotins, or Girondists, co-operated with Robespierre and the Jacobins, the former were sacrificed to the ascendency of the latter. The Hebertists (see *Hébert*), who had joined in this work of destruction, were the next victims to the jealousy of the dictator, who had no sooner sent them to the scaffold, with the assistance of Danton and his friends, than he adopted measures for the ruin of that popular demagogue, whom he dreaded as his most dangerous rival. His next measure was to throw the imputation of atheism and irreligion on those whom he had destroyed, and to establish a species of religious worship. Barrère, by his direction, promulgated his new system of worship, and, June 8, 1794, Robespierre in person celebrated what he termed "the feast of the Supreme Being." His power seemed now to be completely established, and the reign of terror was at its height; but his cruel tyranny and mysterious denunciations had alarmed many of those who had been most intimately connected with him, and a conspiracy was formed for his destruction. (See *Terrorism*.) At this critical juncture, far from acting with the decision which previously marked his conduct, he waited for the attack of his enemies, and secluded himself from the public for more than a month, during which period he is said to have been employed in preparing an elaborate defence of his conduct, to be delivered in the national convention, where he made his appearance for that purpose July 26 (8th Thermidor), 1794. He was indirectly attacked by Bourbon de l'Oise; after which Vadier Cambon, Billaud-Varennes, and several other members, spoke against him. He now perceived the extent of his danger; and the ensuing night was passed in consultation with St Just, and others of his most intimate partisans; but their deliberations led to no decisive results. The next day, when they appeared in the convention, Tallien and Billaud openly accused Robespierre of despotism. A tumult ensued, and, amidst cries of *A bas le tyran!* he in vain endeavoured to obtain a hearing. At length a decree of arrest was carried against him; and his brother, and his friends St Just, Couthon, and Le Bas, were included in it. Robespierre was sent to the Luxembourg prison; but, in the night, he was set free by the keeper, and was conducted to the hall of the commune of Paris, where Henriot, commander of the national guard, Fleuriot, the mayor of Paris, and others of his creatures, had assembled forces for his defence. This was the critical moment; but neither Henriot, nor Robespierre himself, had spirit sufficient to head the mob and lead it against the convention. While they deliberated, their opponents proceeded to action. Barras and others having been appointed commissioners to direct the armed force of the metropolis, they, without difficulty, secured the persons of the fallen tyrant and his associates, who were all guillotined the next day, July 28, 1794. Robespierre endeavoured in vain to escape a public execution, by shooting himself with a pistol at the moment of his seizure; but he only fractured his lower jaw, and thus subjected himself to protracted suffering, which excited no compassion.

Of the wretches who disgraced the revolution, Robespierre was the most notorious, but not the most infamous. He did not court the dregs of the people, like Marat; he amassed no money. He was politically insane, and was not, moreover, the author of all the enormities with which he has been charged. Among his colleagues of the committees, and especially those who were sent into the departments, many exercised cruelties which far exceeded their instructions. Those who contributed most to his overthrow, and were loudest in their accusations against him, had profited by his crimes, in which they were deeply involved; and, like the scape-goat of the Jews, he was charged with the sins of the whole nation, or rather of the Jacobin government. In the Memorial from St Helena, Napoleon is stated to have said that Robespierre displayed in his conduct more extensive and enlightened views than have been generally ascribed to him; and that he intended to re-establish order, after he had overturned the contending factions; but, not being powerful enough to arrest the progress of the revolution, he suffered himself to be carried away by the torrent, as was the case with all before Napoleon himself, who engaged in a similar attempt. As a proof of this, the emperor asserted that, when with the army at Nice, he had seen, in the hands of the brother of Maximilian Robespierre, letters in which he expressed an intention to put an end to the reign of terror. On the whole, it is reasonable to conclude that something like principle and genuine enthusiasm guided this hateful and unhappy man in the first instance; but, wholly unable to govern the elements of wild disorder afloat around him, the characteristic cruelty of perplexed cowardice at length became his only instrument, either of action or self-defence. However stimulated, his career exhibits one of the most signal instances of cruelty upon record.

Among the published works of Robespierre are, *Plaidoyer pour le Sieur Vissery*, in favour of the right of setting up electrical conductors against lightning (1783, 8vo.); *Discours couronné par la Soc. Roy. de Metz sur les Peines infamantes* (1785, 8vo.); *Eloge de Gresset*, in which the author displays an attachment to monarchical goverment and religious institutions; *Eloge de Prés. Duparty*; and a political journal, called *Le Défenseur de la Constitution*. The *Mémoires* of Riouffe, and the *Papiers trouvés chez Robespierre*, &c., contain much curious information concerning him.*

ROBIN, AMERICAN, OR MIGRATING THRUSH (*turdus migratorius*, Lin); specific character, dark ash-colour; beneath rufous; head and tail black; the two exterior feathers of the latter white at the inner tip. The robin is found in summer throughout North America, from the desolate regions of Hudson's bay, in the fifty-third degree, to the table land of Mexico. These birds retire from higher latitudes only as their food begins to fail, and they make their appearance in Massachusetts, feeding on winter berries, till driven to the south by inundating snows. At this season, they are numerous in the Southern States. Even in the vicinity of Boston, flocks of robins are sometimes seen assembling round the open springs in the depth of winter. Towards the close of January, the robin, in South Carolina, still tunes his song, and about the second week of March begins to appear in the Middle States. By the 10th of that month, they may also be heard in Massachusetts. Their nests are often seen on the horizontal branch of an apple-tree, or in a bush or tree in the woods, and so large as seldom to be wholly concealed. The eggs, about five, are of a bluish-green, and without spots. To avoid the attacks of the cuckoo, the robin, says Mr Nuttall (see his *Ornithology*, from which these remarks are taken), has been known to build his nest within a few yards of the blacksmith's anvil, and even in the stern timbers of an unfinished vessel, in which men were constantly at work, and to take the materials of his nest from the pine shavings on the carpenter's bench. They raise several broods in a season. They seem content in a cage, sing well, and readily learn lively parts of tunes, and have even been taught "Old Hundred." They also, in this situation, imitate the notes of most of the birds about them.

ROBIN GOODFELLOW. See *Brownie*.

ROBIN HOOD. See *Hood, Robin*.

ROBIN REDBREAST. See *Redbreast*.

ROBINIA. See *Locust*.

ROBINSON, JOHN, minister of the English church in Holland, to which the first settlers of New England belonged, was born in 1575, and educated at Cambridge. He for some time held a benefice in the established church, but, in 1602, became pastor of a dissenting congregation in the north of England, and, in consequence of persecution, went with them to Holland in 1608. After a short residence at Amsterdam, they removed to Leyden. His talents and reputation were such, that he held a public disputation with Episcopius in 1613. A part of his church emigrated to Plymouth, New England, in 1620, and it was his intention to follow them with the remainder; but his sudden death, March 1, 1625, prevented. He was distinguished for learning, liberality, and piety.

ROBINSON, ROBERT, an eminent dissenting divine, was born in Norfolk, in 1735, and educated at a grammar-school in his native county; he, owing to the loss of his father, and the humble circumstances of his mother, he was apprenticed at the age of fourteen, to a hair-dresser in London. Having attached himself to George Whitefield, he became a preacher among the Calvinistic Methodists, but subsequently relinquished his connexion with the Methodists, and established an independent congregation at Norwich, over which he presided. He was afterwards chosen pastor to a small Anabaptist congregation at Cambridge, and retained this situation during the remainder of his life. In 1773, he removed to Chesterton, near Cambridge, where he engaged in trade as a farmer, corn-dealer, and coal-merchant. His learning and abilities procured him much respect from the members of the university, and other persons belonging to the established church; and he received offers of promotion if he would become a conformist, which he declined. In 1774, he published a translation of the sermons of Saurin, with memoirs of the reformation in France, and the life of Saurin. In 1776, was published his Plea for the Divinity of Jesus Christ, &c. Among his other works are his Plan of Lectures on Non-conformity; the General Doctrine of Toleration; Slavery inconsistent with Christianity; and sixteen Discourses, which had been delivered extempore to illiterate audiences in the vicinity of Cambridge. These were very liberal on doctrinal points; and his tendency to Unitarian principles soon became known, although he still continued his ministerial labours at Cambridge. He died in 1790, in the fifty-fifth year of his age.

ROBINSON CRUSOE. This celebrated romance, written by the well-known Defoe, was published in 1719, under the title of the Life and Surprising Adventures of Robinson Crusoe, of York, Mariner, who lived eight and twenty Years all alone, &c., written by himself. The favourable reception this attempt met with induced the author to pursue the subject, and, a few months later, appeared the

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* The sister of Robespierre still enjoys, or at least, up to a very recent period enjoyed, a pension from the French government.

Further Adventures of Robinson Crusoe, being the second and last Part of his Life, &c. It was with difficulty that the author could at first get any of the trade to undertake the publication of this work, which has since appeared under an almost endless variety of forms, and in almost all languages, and has been the delight of childhood no less than the amusement of those of mature years. "Was there ever any thing written by mere man," says doctor Johnson, "that was wished longer by its readers, excepting Don Quixote, Robinson Crusoe, and the Pilgrim's Progress?" "There is one book," says Rousseau, "which shall long form the whole library of Emile, and which shall preserve a high rank to the last: it is not Aristotle, nor Pliny, nor Buffon: it is Robinson Crusoe." Its fine sentiments, its pure morality, its practical good sense, and its religious character, united with its simplicity, truth of description, and natural and lively delineations of the passions, combine to give it the charm of fiction and the air and weight of reality. A third part, intended as a vehicle for fuller moral and religious instruction, appeared under the title Serious Reflections during the Life and surprising Adventures of Robinson Crusoe, by himself (1722). The work was immediately translated into French, and, soon after, into other languages; and various imitations appeared, both in English and in other languages. The *rifacimento* of Campe, in German, is much used on the continent (translated into Spanish, French, Italian, Latin, &c.), and has been turned into English. The best English editions are those of Chalmers, with a life of Defoe (1790, 2 vols., 8vo.); the academic edition of Mawman (1815), with geographical and nautical notes; and the edition of Cadell and Davies (1820, 2 vols.), with engravings by Heath. The story of Defoe's fraudulently using the papers of a Scotch mariner, by the name of Selkirk, in the composition of his book, is without foundation. He took the hint, doubtless, from Selkirk's adventures, as Shakspeare borrowed Hamlet, Macbeth, or Romeo and Juliet, from Scotch and Danish chronicles or Italian ballads. The real story of Selkirk is as follows: He was a Scottish sailor, who passed some years alone on the island of Juan Fernandez, and was a native of Largo, in Fifeshire. In 1703, he sailed as master in the Cinque Ports privateer, under captain Stradling. In consequence of some difference with his commander, he went ashore at Juan Fernandez, and remained in his solitude till he was taken away by captain Woods Rogers, in January, 1709. Some account of his residence was published by Steele in the Englishman (No. 26), and in Roger's Voyage round the World (1712); but there is no reason to believe that he had any papers, or journal of any sort.—See Howell's *Life and Adventures of Alexander Selkirk* (Edinburgh, 1829); and Wilson's *Life of Defoe* (3 vols., 8vo., 1830).

ROBISON, Dr John, a distinguished mechanical philosopher and professor, was born at Boghall, the seat of his father, in the parish of Baldernock and county of Stirling, in 1739. He was originally destined for the church, and after attending the grammar school of Glasgow, was entered a student of that university in 1750. There he studied Greek under Moore, ethics under Adam Smith, and mathematics under Simson; but it does not appear that his genius for this last science, which was afterwards so conspicuous in his lectures and writings, had then displayed itself. Having either no predilection for the clerical profession, or some scruples as to entering the ministry, he was anxious to provide himself with a situation more congenial to his taste, and, in 1758, accepted the office of private tutor to Mr Knowles, son of Admiral Knowles, who, as a midshipman, was then about to accompany the expedition, under general Wolfe, for the reduction of Canada. In that situation, besides instructing his pupil in mathematics and navigation, he was employed in making surveys of the coasts and harbours on the river St Lawrence, having been rated as a midshipman on board the Royal William, in which his pupil was soon made a lieutenant. This naval career continued for about two years, in the course of which he saw much active service, and made himself well acquainted with seamanship. In 1762, he was appointed by the Board of Longitude, to accompany young Harrison, son of the celebrated horologist, to take charge of the time-keeper lately completed by the elder Harrison, in a voyage to the West Indies. In 1763, he returned to Glasgow, and renewed with ardour his academical studies, devoting himself more particularly to mechanical philosophy, to which he was influenced by his acquaintance with Mr Watt, then employed in perfecting the steam-engine.

His friend, admiral Knowles, having been recommended by the British government to the empress Catharine of Russia, to superintend the improvement of her navy, Mr Robison was induced to accompany him in the capacity of private secretary, in 1770. After remaining in this situation for nearly two years, he was appointed, by the empress, inspector-general of the troops of Marine cadets at Cronstadt, with the rank of lieutenant-colonel. But he soon relinquished that respectable office, on being invited, in 1773, to accept the vacant chair of natural philosophy at Edinburgh, which he continued to fill with distinguished reputation till his death, in 1805.

Dr Robison was a man of elegant person, dignified deportment, and polished manners. As a lecturer, he was conspicuous rather for the extent and value of the information which he communicated, than for the perspicuity with which that information was conveyed. His pupils have generally complained, that his lectures were too abstruse and mathematical, and not sufficiently enlivened by experiments, and that his delivery was too rapid. His writings are numerous and important, and extend through nearly the whole circle of physical science. They were first published in the third edition of the Encyclopedia Britannica, and the Supplement to that edition, and have lately been collected into one uniform work, with many additions and annotations, and published in 4 vols. 8vo. with a volume of plates, by Dr Brewster.

ROB-ROY (that is, *Robert the Red*); a celebrated Highland freebooter, whose true name was Robert Macgregor, but who assumed that of Campbell, on account of the outlawry of the clan Macgregor by the Scotch parliament, in 1662. He was born about 1660. He was the younger son of Donald Macgregor of Glengyle, said to have been a lieutenant-colonel in the service of James II., by his wife, a daughter of Campbell of Glenfalloch. His own designation was of Inversnaid, but he seems to have acquired a right to the property of Craig Royston, a domain of rock and forest lying on the east side of Loch Lomond. Like other Highland gentlemen, Rob-Roy was a trader in cattle previous to the rebellion of 1715, in which he joined the adherents of the pretender. (See *Stuart, James Edward.*) On the suppression of the rebellion, the duke of Montrose, with whom Rob-Roy had previously had a quarrel, took the opportunity to deprive him of his estates; and the latter began to indemnify himself by a war of reprisals upon the property of the duke. An English garrison was stationed at Inversnaid, near Aberfoyle, the *clachan* (residence) of Rob-Roy; but his activity and courage saved him from the hands of his enemies, from whom he continued for some time to levy black-mail. The time of his death is uncertain, but he is known to have survived the year 1733, and died an aged man, in his bed, in his own house, in the parish of Balquhidder. See Sir Walter Scott's Introduction to the novel of "Rob-Roy" for a full account of this chieftain, whom the great novelist has plucked from the dim light of fast-fading tradition, and placed in immortal radiance among the brightest creations of his fertile imagination.

ROCAMBOLE (*allium scorodoprasum*); a species of onion, having bulbs resembling those of the garlic; but the cloves are smaller. It is cultivated for the same purposes, and is considered as having a more delicate flavour.

ROCHAMBEAU, Jean Baptiste Donatien de Vimeur, comte de, marshal of France, born at Vendome, in 1725, entered the army at the age of sixteen, and served in Germany under marshal Broglio. In 1746, he became aid-de-camp to Louis Philip, duke of Orleans; and afterwards, obtaining the command of the regiment of La Marche, distinguished himself at the battle of Lafeldt, where he was wounded; obtained fresh laurels at Creveldt, Minden, Corbach and Clostercamp; and, having been made lieutenant-general, was, in 1780, sent with an army of 6000 men to the assistance of the United States of America. Having embarked in Rhode Island, he acted in concert with Washington, first against Clinton, in New York, and then against Cornwallis, rendering important services at the siege of Yorktown, which were rewarded by a present of two cannons taken from lord Cornwallis. After the revolution, Rochambeau was raised to the rank of a marshal by Louis XVI., and he was appointed to the command of the army of the north. He was soon superseded by more active officers, and, being calumniated by the popular journalists, he addressed to the legislative assembly a vindication of his conduct. A decree of approbation was consequently passed in May, 1792, and he retired to his estate, near Vendome, with a determination to interfere no more with public affairs. He was subsequently arrested, and narrowly escaped suffering death under the tyranny of Robespierre. In 1803, he was presented to Bonaparte, who, in the year following, gave him a pension, and the cross of grand officer of the legion of honour. His death took place in 1807. His *Mémoires* were published in 1809 (8vo). Robin's *Voyage dans l'Amérique Septentrionale* (1782) contains some important details concerning Rochambeau's campaign in the United States.

ROCHDALE; a market-town of England, in the county of Lancaster, is situated 198 miles N.N.W. from London, at the foot of the Blackstone edge hills, occupying two valleys formed by the Roche and Spaddon rivers. It consists of three principal streets, and several irregular ones, all well paved and lighted with gas. The houses are in general well built of stone. The chief public edifices are the church and chapel of the parish, a cloth hall, a theatre, a town hall, an assembly room; besides chapels for Presbyterians, Baptists, and Methodists. The church, dedicated to St Chad, stands on a considerable eminence, the ascent to which, from the lower part of the town, is by a flight of 122 steps. It is a spacious building, in the early pointed style, with an embattled square tower, ornamented with pinnacles; and within it is an ancient stone font. There is a chapel of ease to this church, called St Mary's chapel, which was erected in [illegible] A district chapel, dedicated to St James, was built in 1820, in the later pointed style, with an embattled tower. The principal manufactures of Rochdale are those of baize, flannel, Bath coating, broad cloth, calicoes, and strong cotton goods. The spinning of cotton is also carried on very extensively; and hat-making furnishes employment for a number of persons. Many of the factories are on a very large scale, and their number is increasing, in consequence of the important advantages for commercial intercourse which the town enjoys through the Rochdale Canal. (See *Canal*.) The market, held on Mondays, is a great corn mart, and is noted for extensive sales of wool and manufactured articles; there is likewise a great market held once a month. The parish of Rochdale is very extensive, being thirteen miles in length, and eleven in breadth, but hilly and moorish. It comprises three chapelries and eight townships. The Liverpool and Leeds railway, and that of Manchester and Leeds, pass near Rochdale. Population of market-town and parish of Rochdale, with Saddleworth and Quick, in 1831, 74,427.

ROCHECHOUART. See *Montespan*.

ROCHEFOUCAULD, Francois, duke de la, prince of Marsillac, a wit and nobleman of the reign of Louis XIV., was born in 1613. He distinguished himself as the most brilliant nobleman about the court, and by his share in the good graces of the celebrated Duchess of Longueville, was involved in the civil war of the Fronde. He signalized his courage at the battle of St Antoine in Paris, and received a shot which for some time deprived him of sight. At a more advanced period, his house was the resort of the best company at Paris, including Boileau, Racine, and the mesdames Sevigne and La Fayette. He died 1680, in his sixty-eighth year. This nobleman wrote, *Mémoires de la Régence d'Anne d'Autriche*, (2 vols. 12mo, [illegible]) a spirited and faithful representation of that period; but he is chiefly famous for a work entitled *Reflexions et Maximes*, founded on the principle that self-love is the foundation of all our actions.

ROCHEFOUCAULD-LIANCOURT, Francois Alexandre Frederic, duke de la, born in 1747, was a member of the constituent assembly in 1789, after the dissolution of which he took the military command at Rouen, in his capacity of lieutenant general (1792.) After the 10th of August the Duke de Liancourt, as he was then styled, left France, and resided for eighteen months in England. He then travelled through the United States, whence he returned in 1798, and after the 18th Brumaire, returned to France, where he devoted himself to the promotion of the useful arts and to benevolent offices. It was through his influence, that vacinnation was introduced into France. After the restoration, he was created a peer, but, on account of the liberality of his sentiments, was, in 1823 and 1824, excluded from the council of state, and removed from the several boards of which he was a member; among others, of that for the encouragement of vacinnation. This venerable philanthropist and patriot, whose last years were persecuted by the intemperate zeal of political bigotry, died at Paris, in 1827, at the age of eighty-one years. His life, by his son, was published the same year. His principal work is his *Voyage dans les Etats-Unis*, 8 vols. 8vo.

ROCHEJAQUELEIN, Henri de la, the hero of Vendée, born at Chatillon, in Poitou, in [illegible] The peasants of the neighbourhood having risen in the royal cause, (1792,) he placed himself at their head, and led them against the republican troops after a short harangue :—"*Allons chercher l'ennemi ; si je recule, tuez moi ; si j'avance, suivez moi ; si je meurs, vengez-moi.*" "Let us seek the foe ; if I retreat, kill me ; if I advance, follow me ; if I die, avenge me." After gaining sixteen victories in ten months, he fell, at the age of twenty-two years, March 4, 1794, in a single combat with one of the republican soldiers. Marie Louise, marchioness de la Rochejaquelein, wife of his elder brother, who fell in Vendée in 1815, has written Memoirs of the War in the Vendée.

ROCHELLE, La ; a commercial city of France, in the department of the Lower Charente, on the Atlantic ocean, 100 miles north-west of Bordeaux ; lat. 46° 9′ N.; lon. 1° 9′ W.; population 17,500. It is well built, and strongly fortified (by Vauban), and contains many handsome squares and fountains. The harbour is safe and commodious, but is accessible for large vessels only at high water. The *Place d'armes*, or *du château*, is one of the finest in France. Glass, stone-ware, and refined sugar, are the principal articles manufactured, and it has a considerable commerce. Rochelle is chiefly remarkable as the stronghold of the French Protestants (see *Huguenots*) in the times of the house of Valois, and of the first Bourbons. In 1627, it was beseiged by Richelieu, and was reduced by famine after a heroic defence, in which 15,000 of the beseiged perished. A great number of the inhabitants fled to North America.

ROCHELLE SALT. See *Tartaric Acid*.

ROCHESTER, an ancient city of England, in the county of Kent, is situated 29 miles E. S. E. from London, on the east bank of the Medway, at a bend of the river, where it falls into the Thames. A continuous row of buildings connects it with Chatham, and by a bridge over the Medway, erected towards the end of the fourteenth century, it communicates with the town of Stroud. The city within the walls consists chiefly of a spacious street, intersected by several others, and extending from the bridge on the west to an elevated range of houses on the east, connecting Rochester with Chatham. The houses in general have an antiquated appearance, and among them are several timber and brick buildings: the streets are well paved and are lighted with gas. On the south side the city is strongly fortified, the works having been chiefly erected since 1802. Fort Pitt, which extends from St Margaret's parish into that of Chatham, is now used as a military hospital; and Fort Clarence, westward of St Margaret's church, is become a lunatic asylum for soldiers. These fortresses, in connection with Chatham Lines form a series of defensive works, commanding the Medway from Gillingham Fort to Rochester bridge. The trade of this place principally depends on its vicinity to the dock yard and victualling office, at Chatham, and on the occasional residence here of persons connected with the army and navy. Ship building is carried on here to a small extent ; and the oyster-fishery is a source of considerable profit ; great quantities of oysters being sent to London, Holland, and Germany. From the returns to parliament of the number of ships belonging to each of the British ports in 1829, it appears that there were belonging to Rochester, 255 ships, the burden of which in all was 10,816 tons. The average number of vessels entering this port annually has been estimated at 320 foreign, and 120 British. The weekly markets are well supplied with fish and provisions in general : there is a corn market recently established ; and a cattle market is held monthly on Wednesdays. The principal public buildings and establishments of Rochester are the Castle, the Cathedral, the Town-hall, and the Churches. The castle was erected after the Norman conquest by Bishop Gundulph, and its ruins form one of the most interesting and entire examples of a Norman fortress existing in the kingdom. The cathedral church was also erected by Bishop Gundulph about 1080, and is a fine cruciform edifice of Norman architecture. It is dedicated to St Andrew. The town-hall is a handsome brick edifice, built in 1687 ; it is supported by Doric columns, and it contains a hall, the ceiling of which is ornamented with trophies and armorial bearings ; and here are portraits of William III. and Queen Anne, by Kneller, with those of Sir Cloudesley Shovel, Sir Joseph Williamson, and other public benefactors of the city. Population of Rochester, in 1831, 9,891.

ROCHESTER, a rising town of America, in the western part of New York, situated on both sides of Genesee river, lat. 43° 15′ N. long. 77° 51′ W. Its population, which in 1815, was only 331, had amounted in 1832 to 12,000. Its position and natural advantages make it the commercial emporium of Western New York.

ROCHESTER, John Wilmot, earl of, a witty and profligate nobleman of the court of Charles II., was born in 1648, and, on the death of his father, succeeded him in his titles and estates, the latter of which his extravagance soon dissipated. Having gone through the usual course of academical study at Oxford, he made a tour through France and Italy, and then served in the fleet under Lord Sandwich. On his return to England, he rushed into the full vortex of dissipation, and became the personal friend and favourite of his sovereign, who is said to have encouraged and shared many of his exploits. The levity of his disposition frequently brought him into disgrace, and he was more than once forbidden the royal presence ; his companionable qualities, however, which made him necessary to the amusement of his master, prevented his occasional exile from being ever of long continuance. His contitution at length gave way under such excesses ; and at the age of thirty, he was visited with all the debility of old age. He lingered for some time in this condition, and died, professing great penitence for his misspent life, July 26, 1680. His poetical works, some of which are of the most disgusting description, have been frequently printed. A few of his poems are of a better description, especially his poem on Nothing, and his lampoon upon Sir Carr Scroope, which exhibit some vigour, with careless versification. His satire on Man is little more than a translation from Boileau. See his Life by Bishop Burnet, and Johnson's *Lives of the Poets*.

ROCK SALT. See *Salt*.

ROCKET (*eruca sativa*, or the *brassica eruca* of Linnæus) ; a cruciferous plant, allied to the turnip and cabbage, growing wild in many parts of Europe. It has a strong disagreeable odour, an acrid and pungent taste, but is, notwithstanding, much esteemed by some, and especially by the Italians, who use it in their salads. Its medicinal properties are antiscorbutic, and very stimulant. The stem is about a foot and a half high, rough, with soft hairs, and bearing long pinnated leaves ; the flowers are whitish or pale yellow, with violet veins, and are disposed in racemes. The term *rocket* is is also applied to the different species of *hesperis*—cruciferous plants with purple flowers, often cultivated for ornament in gardens.

ROCKET, SKY. See *Pyrotechny*.

ROCKETS, CONGREVE. See *Congreve, Sir William*.

ROCKINGHAM, Charles Watson Wentworth, marquis of, a British statesman, born in

1730, succeeded his father in his titles and estates in 1750, and, in 1765, became First Lord of the Treasury, (prime minister.) American affairs formed at that time, a leading subject of discussion; and Rockingham took the middle way of repealing the stamp act, and declaring the right of Great Britain to tax the colonies. He was therefore deserted by some of his supporters (among others, by Chatham), and retired from the ministry in 1766. He afterward acted in concert with Chatham, in opposition to the North ministry, on the fall of which, in 1782, he was again placed at the head of the treasury, but died in the same year, and was succeeded by Lord Shelburne.

ROCKS. See *Geology*.

ROCKY MOUNTAINS, in the western part of North America, extend from lat. about 70° north to Mexico, where the chain is continued by the Cordilleras. Their distance from the Pacific ocean is about the same as that of the Alleghanies from the Atlantic; but the extent, and breadth, and height of the Rocky mountains are much greater than those of the Alleghanies. They are of decidedly primitive formation; but they have not been so well explored as to enable us to give any scientific statements in relation to them. In latitude 47°, they are so elelated as to be covered with ice and snow in July. Some of the peaks are supposed to be twelve or thirteen thousand feet high, and the range generally is considerably higher than any other in North America, except that of the Cordilleras. The numerous peaks are not named, and have not been measured. We know not with certainty that any are volcanic. The trappers, who are almost the only white people that visit them, frequently relate that they have heard explosions, which were supposed to be from volcanoes. Pumice stones, of a reddish colour, and remarkably perfect, frequently descend the Missouri. These are said by some to be formed from burning coal-mines; but it is more probable that they proceed from volcanoes. These mountains generally appear black, rugged, and precipitous, though their aspect is not uniform. The great rivers that are discharged from their eastern and western declivities wind far among the mountains, the Arkansas on the east, and the Orogon, or Columbia, on the west, more than a hundred leagues, before they escape to the plains. In following the beds of such streams, travellers pass through the range without any considerable ascent or obstruction. Following the Platte, which is one of the principal southern branches of the Missouri, the traveller finds a road even to lake Buenaventura, on the Pacific plains, that needs little labour to adapt it to the passage of horses and wagons. Such is the testimony of numerous traders, who cannot be supposed to deceive, nor to intend deception. The southern part of this range is called the *Masserne Mountains*. They give rise to the Rio Colorado, which flows into the Pacific, the Rio del Norte of Mexico, the Yellowstone of the Missouri, and the Arkansas and Red, which flow into the Mississippi. A single peak of this range is seen, as a landmark, for an immense distance on the plains of Arkansas and Texas. This is called *Mount Pike*, and has been variously estimated at from seven to ten thousand feet in height. Many accounts have been given of the appearance of silver and other metals, in the Rocky mountains.

ROCROY; a town of France, 15 miles north-west of Mezeres, 110 north-east of Paris, celebrated for the victory gained by the duke d'Enghien, (afterwards the great Conde,) over the Spaniards, who were besieging the city, May 19, 1643. See *Conde*.

RODNEY, GEORGE BRYDGES, Baron Rodney; a naval commander, born in 1717. His father, a captain in the royal navy, educated his son for the same profession. The latter first obtained a ship in 1742, and, in 1749, went to Newfoundland as governor. In 1759, having been promoted to the rank of Admiral, he commanded the expedition destined for the bombardment of Havre, which he executed with success. In 1761, he sailed to the West Indies, where he distinguished himself in the reduction of Martinique, and, on his return, was rewarded with a baronetcy. A contested election for Northamptonshire (1768) impaired his finances, and he found it necessary to retire to the continent. The French government made some overtures to him which would have recruited his fortune. These he rejected, and the fact having transpired, he was placed in command of a squadron destined for the Mediterranean. In 1780, he fell in with Admiral Langura's fleet, off Cape St Vincent, and completely defeated it. In 1781, he sailed for the West Indies; and, April 12, 1782, obtained a decisive victory over the French fleet, under De Grasse, capturing five, and sinking one of his largest vessels. A barony, and a pension of £2000, were bestowed upon him for his services; and on his decease, 1792, a monument was voted to his memory, at the national expense, in St Paul's. Lord Rodney is described by some writers as the first who practised the system of breaking through the centre of the enemy's line. See *Clerk*.

RODOLPH I. emperor of Germany, founder of the imperial house of Austria, was born in 1218, being the eldest son of Albert IV., count of Hapsburg, and landgrave of Alsace. He was brought up in the court and camp of the emperor Frederic II.; and on the death of his father, succeeded to territories of a very moderate extent, which, in the spirit of the times, he sought to augment by military enterprises. In 1245, he married a daughter of the count of Homburg, by whom he acquired an accession of territory; and, some years after, served under Ottocar, king of Bohemia, against the pagan Prussians. Several years of active warfare ensued, in which he much distinguished himself by his prudence, valour, and the spirit of justice with which he protected the inhabitants of the towns from their baronial oppressors. In 1273, as he was encamped before the walls of Basle, he received the unexpected intelligence that he was elected king of the Romans, and emperor, in preference to Alphonso, king of Castile, and Ottocar, king of Bohemia. Rodolph, then in his fifty-fifth year, willingly accepted the proffered elevation, and, being crowned at Aix-la-Chapelle, immediately strengthened himself by marrying two of his daughters to the count palatine of Bavaria, and the duke of Saxony. He also took measures to ingratiate himself with pope Gregory X., who induced the king of Castile to withdraw his pretensions. The king of Bohemia, however, at that time one of the most powerful princes in Europe, persisted in his opposition, and a war ensued, in which he was defeated, and compelled to sue for peace, and agree to pay homage. Stung by this disgrace, the Bohemian king broke the treaty in 1277, and the following year Ottocar was again defeated and slain. By the treaty with his successor, which followed, Rodolph was to hold Moravia for five years, and retain the Austrian provinces which had been previously yielded by Ottocar, and the securing of which to his family was henceforward his primary object. After some abortive attempts to restore the influence of the empire in Tuscany, he contented himself with drawing large sums from Lucca, and other large cities, for the confirmation and extention of their privileges.

No foreign foe remaining, he assiduously employed himself to restore peace and order to Germany, and wisely put down the private fortresses, which served as a retreat to banditti and to ferocious nobles. For these and other eminent services in the same spirit, he obtained the title of "a living law," and was regarded as a second founder of the German empire. He subsequently engaged in war with the counts of Savoy and of Burgundy, and delivered the young king of Bohemia from the captivity to which he had been subjected by the regent Otho, and married him to one of his daughters. The final object of the emperor was to secure the imperial succession to his son Albert; but the electors, jealous of the rapid rise of the family, could not be made to concur, and Rodolph felt the disappointment severely. He had, however, laid a permanent foundation for the prosperity of his race; and, after a reign of nineteen years, expired in July, 1291, in the seventy third year of his age. There is scarcely an excellency, either of body or mind, which the biographers of the house of Austria have not attributed to its founder; and he appears to have merited no small portion of their panegyric. Few princes have surpassed him in energy of character, and in civil and military talents. He was personally brave, almost to rashness, indefatigable, simple and unaffected in his manners, affable, and magnanimous. In the beginning of his career, he seems to have shared in the usual license of the period, in pursuit of aggrandizement; but, as an emperor, he has been considered, for the most part, as equitable and just as he was brave and intelligent.

ROEBUCK, Dr John, an English physician and improver of chemical manufactures, was born at Sheffield, in Yorkshire, in 1718. His father was a respectable hardware manufacturer, and designed this his eldest son as his successor in the trade; but finding his taste and genius led him to higher pursuits, he consented to give him a liberal education. From the grammar-school of Sheffield he was placed at Northampton, under the tuition of Dr Doddridge, with whom he made great proficiency in classical knowledge and general literature. On leaving Dr Doddridge's academy, he was sent to Edinburgh, to study medicine, and there he directed his particular attention to chemistry. From Edinburgh he repaired to Leyden, where he obtained the degree of M. D. in 1743. Soon after he quitted Leyden, or about 1744, he settled as a physician at Birmingham, and acquired much reputation as a skilful and humane practitioner; but his taste for chemical researches, inclined him to occupy more time than could well be spared from the duties of his profession, in the labours of the laboratory, and he soon found it necessary to engage, as his assistant, Mr Samuel Garbet, a gentleman whose taste was congenial to his own. This copartnery proved very profitable, both to the chemists concerned and to the public. In 1749, Dr Roebuck, who was then married, and Mr Garbet, established a manufactory of oil of vitriol, or sulphuric acid, at Prestonpans, in East Lothian. The success of this speculation was for some years very flattering, and soon induced Dr Roebuck, who still continued to practice at Birmingham, and who had received a pressing invitation to remove in the same capacity to London, to relinquish medical practice entirely, and devote himself exclusively to his chemical pursuits.

Within a short time after he had quitted the practice of medicine, and taken up his residence chiefly in Scotland, he was led, from some successful experiments on iron ore, to project an extensive manufactory of cast-iron, and having contrived to interest several monied friends in the undertaking, so as to raise a sufficient capital, he, with the assistance of the eminent engineers, Smeaton and Watt, established the celebrated iron works at Carron. The first furnace of this great national manufactory, which has since become so extensive and flourishing, was set at work on the 1st January, 1760, and the establishment continued to be carried on with spirit and success for several years, under the superintendence of Dr Roebuck. There is little doubt, that, had he confined his attention to these well concerted schemes, he might have realized a handsome independency; but, unfortunately, his restless and ardent spirit induced him to engage in new, doubtful, and, as they turned out, ruinous speculations. Finding, or fearing some scarcity of coal for carrying on the processes at Carron, he conceived the idea, that if he had the neighbouring coal-works at Borrowstouness, belonging to the duke of Hamilton, under his own management, he could easily supply the deficiency, and add considerably to his own income. He therefore became lessee of those works, and the adjoining salt-works, and, in this new undertaking, not only expended his own and his wife's fortune, but involved himself in many debts, which he was never afterwards able to discharge. These embarrassments, and the continual anxiety which they produced, added to a dangerous complaint, gradually undermined his naturally vigorous constitution, and he died in 1794. It has been well remarked by his biographers, that he left behind him many *works*, but few *writings*. With the exception of two political pamphlets, which were published separately, his compositions consist only of three papers, published in the Phil. Trans. of London, for 1775 and 1776, and in those of Edinburgh, for 1784.

RŒMER; the name of the town-house in Frankfort on the Maine, in which the deliberations on the election of the German emperor were held. The newly crowned emperor here received homage. In one large room of the Rœmer are the pictures of all the emperors from Charlemagne to Francis II.; and it is a curious fact, that the wall had been so filled, as to leave room but for one picture more, when the portrait of Francis II., with whom the German empire expired, was added to the series. The name of the house comes from the family Rœmer, which sold it, in 1405, to the city.

ROGER, or ROGIER VAN DER VEYDE, one of the most eminent painters of the Old Netherlandish school, was born at Brussels, and died in 1529. In the hall of his native city are four allegorical pictures by him. A celebrated Descent from the Cross, executed by him, was sent to Spain; another is in Aix-la-Chapelle. Roger was also distinguished as a painter on glass.

ROGER DE HOVEDEN. See *Hoveden, Roger de.*

ROGERS, Woods, an English circumnavigator, belonged to the royal navy in 1708, when he was invited by the merchants of Bristol to take the command of an expedition to the South Sea. He set sail with two vessels, the Duke and the Duchess, taking out Dampier as a pilot. Passing to the south of Terra del Fuego, in January, 1709, they entered the Pacific Ocean, and February 1, arrived at the isle of Juan Fernandes, where they found Alexander Selkirk, (see *Robinson Crusoe*,) and having visited the coast of California, crossed the Pacific, and returned to England in Oct. 1711. Captain Rogers was afterwards employed with a squadron to extirpate the pirates who infested the West Indies. He died in 1732. His Voyage Round the World was published in 1712.

ROGIER. See *Roger*.

ROHAN, Louis Rene Edouard, prince de, cardinal-bishop of Strasburg, born in 1734, was at first known under the title of *Prince Louis*. The dissipation in which the young ecclesiastic indulged did not prevent him from attending to study, nor from forming ambitious projects. In 1772, he went as ambassador to the court of Vienna. He derives his notoriety, however, chiefly from the affair of the necklace, (See *Marie Antoinette* and *Lamotte*.) He was then grand almoner of France, and being thrown into the Bastile, continued in prison more than a year, when he was acquitted and released by the parliament of Paris, August, 1786. He was afterwards a member of the constituent assembly, but, on account of his opposition to the revolutionary principles, was obliged to retire to Germany, where he died in 1803. See the *Mémoires* of Georgel, Campan, &c., and the *Recueil des Pieces concernant l'Affaire du Collier*

ROLAND, Jean Marie Baptiste de la Platiere, born in 1734, was previous to the revolution engaged in manufactures. Being sent to Paris by the city of Lyons, on official business before the national assembly (1791), he became connected with Brissot and other popular leaders, through whose influence, he was appointed minister of the interior in 1792 ; his principles, however, were so far from being agreeable to the king, that he was dismissed after a few months ; but after the 10th of August, (see *Louis XVI.*) he was recalled to the ministry, and continued to hold his place until the proscription of the Girondists (q.v.) compelled him to leave Paris. On receiving, at Rouen, the news of the death of his wife, he killed himself with a sword-cane. Roland was the author of the Dictionary of Manufactures, (3 vols. 4to,) forming part of Panckoucke's *Encyclopédie Méthodique*, and of several other works. His wife *Manon Jeanne*, was born at Paris, in 1754, and was the daughter of an engraver. She was remarkable for her beauty, and received an excellent education. The study of Greek and Roman history early inflamed her imagination, and gave her a tendency to republican sentiments. After her marriage, in 1779, Madame Roland took part in the studies and tasks of her husband, and accompanied him to Switzerland and England. The revolution found in her a ready convert to its principles ; and, on the appointment of her husband to the ministry, she participated in his official duties, writing and preparing many papers, and taking a share in the political councils of the leaders of the Girondist party. (See *Girondists*.) On the fall of her husband, she was arrested. She conducted herself with great firmness during the trial, and at the time of her execution, "Oh Liberty, what crimes are committed in thy name!" was her exclamation, when she arrived at the scaffold, November 8, 1793. Madame Roland had laid aside the modesty and softness of her sex, and had adopted deistical notions in religion. While in prison she wrote Memoirs of her Life, which have since been published, with her other writings relating to the events of the revolution. The most complete edition is that forming part of the memoirs relating to the French revolution, under the title *Mémoires de Madame Roland, avec une Notice sur sa Vie*, with notes (1820). See *Memoirs*.

ROLAND, or ORLANDO ; a celebrated hero of the Romances of Chivalry, and one of the paladins (q. v.) of Charlemagne, of whom he is represented as the nephew. His character is that of a brave, unsuspicious, and loyal warrior, but somewhat simple in his disposition. According to the romances he fell on the retreat of Charlemagne from Spain, in the Roncesvalles (Roncevaux), a pass of the Pyrenees, with the flower of the Frankish chivalry. His adventures are contained in the fabulous Chronicle of Turpin, (*De Vita Caroli Magni et Rolandi*,) and the Old French Romances relating to Charlemagne and his Paladins. (See *Romance*.) The celebrated romantic epics of Boiardo (*Orlando Innamorato*), and Ariosto (*Orlando Furioso*), relate to him and his exploits.

ROLAND'S, or RULAND'S COLUMNS, are stone statues of a man in armour, generally rudely formed, and found in twenty-eight German cities. According to tradition, they were erected in honour of Charlemagne's paladin Roland ; but if ever the hero existed (see *Roland*), the Germans, particularly the Saxons, in whose former territory they are found, would probably have been the last to erect statues to him. Besides, they are evidently of a later age: probably they were the same with the *Weichbild*, the symbol of incorporated towns, possessing jurisdiction over their own members ; and thus the name has been considered a corruption of *Rügelandssäulen* (Rugeland's columns), from *Ruge*, which was equivalent, formerly, to *Courts of Justice*. See Tuerk *De Statuis Rolandinis* (Rostock, 1824).

ROLLER (*coracias*) ; a genus of birds allied to the crows and jays, found in Europe, Asia, Africa, and in the hot climates of America. They are more wild and untractable than their congeneres, and do not appear to possess the imitative faculty of the jay or magpie, as all attempts to teach them to speak have been unsuccessful. The plumage of almost all the species is very beautiful, being in general an assemblage of blue and green, mixed with white, and heightened by the contrast of more obscure and less vivid colours. The rollers are very shy, inhabiting the thickest and most unfrequented woods, though like the crows they are frequently seen in newly ploughed fields, searching for worms and larvæ. They are not carnivarous, except in cases of necessity, and their flesh is said to be palatable.

ROLLIN, Charles, a historian, was born at Paris in 1661. His father was a cutler, who intended him for the same business ; but his talents obtained the notice of a learned Benedictine, who procured him a place in the college of Du Plessis, by which he was enabled to gratify his inclination for learning. After going through a course of theology at the Sorbonne, he received the tonsure. In 1688, he obtained the chair of eloquence in the royal college, of which he became rector in 1694 ; reformed the academical course in many particulars, and revived the study of the Greek language. In 1698, he was chosen coadjutor or head of the college of Beauvais, which was also much benefited by his attention. In 1720, he was again chosen rector of the university of Paris ; but was displaced in consequence of his connexion with the Jansenists. His productions are *Traité des Etudes* (1726). *Histoire Ancienne* (13 vols., 1730 and 1738) ; and Roman History (5 vols.), to the war against the Cimbri, (completed by Crevier, 16 vols., 12mo.) He died in 1741. Rollin's writings are distinguished for purity and elegance of style, but they are diffuse and prolix, and his historical works are deficient in critical sagacity. There is an edition of his works in 30 vols. 8vo. (Paris, 1827,) with notes on the historical parts by Guizot. His Ancient History has been often reprinted in English. The best edition is that with notes, by James Bell, Glasgow, 2 vols. 8vo.

ROMAGNA ; formerly a province of the States of the Church, bordering on the Adriatic, forty-five miles in length by thirty in breadth. The delegations of Forli and Ravenna have been formed from it.

ROMAIC. See *Greece*, division *Modern Greek Language and Literature*.

ROMANA, MARQUIS DE LA; general in the war of the Spaniards against Napoleon. Preparatory to his plans against the Bourbons in Spain, the French emperor had drawn to Germany, in 1807, a body of from ten to twelve thousand Spanish troops, at the head of which was general Romana, who taking advantage of his station on the island of Funen, entered into a secret correspondence with the commander of the English fleet established there, obtained English transports, and with all his forces, excepting a few divisions, who could not be brought up quick enough, embarked between the 17th and 20th of August, 1808, at Nyborg and Svenborg, and arrived at Corunna. From this time Romana was incessantly employed in exciting the Spaniards. He was the first to suggest the idea of arming the peasantry and forming the Guerillas. In this way, as well as by his personal services in the field, Romana had an important part in maintaining the independence of Spain. He died in 1811.

ROMAN CATHOLIC CHURCH; that society of Christians which acknowledges the bishop of Rome as its visible head, in contradistinction to the Greek Church, which likewise calls itself a *catholic*, that is, a *universal* church, but disowns the Roman pope. The Roman Catholic Church exercised a spiritual supremacy over all Europe, with the exception of Russia and Turkey, until the time of the reformation. It has more followers than all the Protestant sects united; and its exertions have gradually brought nearly 2,000,000 of the adherents of the Greek ritual in Europe under the spiritual dominion of the pope. (See the article *United Greeks*.)

I. *The Foundation of the Catholic Faith*. Christianity is a revelation, a positive historical religion. Both Protestants and Catholics believe in the reality of Christ's revelation; and the first and fundamental difference between them is, that the former considers the Bible the only repository of this divine revelation, while the Catholic acknowledges, in addition to this, the authority of tradition, or (which amounts to the same thing) considers the Christian revelation as handed down by tradition, of which the Bible, according to his belief, makes a part, just as a code of laws constitutes a part only of the whole law of a land; and its deficiencies are supplied by the traditional law preserved among the people, without which no code could exist. The Catholic considers tradition as the very life of his church, and the whole of his religion as depending upon a correct understanding of it; for which reason we give the following exposition, the production of a Catholic writer, without comment.

Mankind commenced with goodness, but error and evil soon sprang up. The Son of the eternal Father came, took away guilt, and established Christianity. The Son, the Holy Spirit, and the apostles of the Son, taught it, and the believers handed it down from generation to generation. Various portions of that which the apostles taught and delivered as what they had received from their Lord, and seen of him, were committed to writing; and such writings became a part of the revelation. The revelation brought by the Son was not a written code, but the living Word. The Son did not write a single letter. The apostles were not commanded to commit doctrines to paper, but to go into all the world and to preach the gospel. (*Matt*. x. 7.) There was a rule of faith which, for a long time before the New Testament was written, was the spiritual property of the church. In the course of centuries, the Epistles of the apostles were collected, and, several centuries after the origin of Christianity, these, together with the Gospels, which were also authenticated by tradition, were formed into the *canon* (q. v.), which constitutes the body or entire collection of those writings which have been transmitted to us as divine: thus none of the fathers thought of confining the sources of the religious knowledge of the church to them exclusively. Irenæus says, "Every one who would know the truth is at liberty to *examine the tradition of the apostles, which has been proclaimed through all the world*; and we might also refer to the authority of all those bishops who have been appointed in the church by the apostles and their successors, even to our times. If the apostles had left behind no writings, should we not have been obliged to follow the tradition preserved by those to whose care the apostles intrusted the church? Many barbarous nations which believe in Christ, and upon whose hearts the doctrines of salvation have been impressed by the Holy Spirit without the aid of writing, do so, and carefully preserve the old tradition." Clement of Alexandria speaks of his teachers thus: "They preserved the true tradition of the doctrines of salvation, and, by the help of God, handed it down to us from Peter, James, John and Paul, the holy apostles (like children who transmit the inheritance of their father), in order to deposit the seeds of apostolical doctrine preserved by their predecessors." Basilius: "Some of the dogmas and public instructions preserved in the church, we have learned from the Sacred Scriptures; others we have received as mysteries handed down to us by the tradition of the apostles. Both have equal validity in religion, and no man will gainsay them, who is in the least conversant with the order of things established in the church. I consider it as apostolical to adhere, also, to the unwritten traditions." Chrysostom says, "Thence it appears that the apostles did not teach every thing by epistles, but that they also taught without writing. But the unwritten instructions are as worthy of belief as the written. Let us, therefore, hold the tradition of the church as worth of belief." Other fathers of the church have expressed themselves alike decisively; and even the Protestant Semler says, "Nothing but ignorance of history has confounded the Christian religion with the Bible, as if there were no Christianity when there was yet no Bible; or as if, on that account, those Christians who, of four Gospels, knew only one, and of so many Epistles knew only a few, had been less truly pious. Previous to the fourth century, no such thing as a complete New Testament had been thought of; and yet there were always genuine disciples of Christ." That which was written is, therefore, according to the Catholic view, only a part of the tradition, and not the tradition itself. The knowledge of the Catholic church is of a historical character, not speculative. The Catholic believes that his tradition rests on the same grounds as the faith of the Protestant in the Bible, because it is tradition originally which assures the Protestant of the genuineness of the Bible. The consistent Catholic, therefore, endeavours to ascertain accurately this tradition, i. e. to guard the purity of his faith. The first means for the attainment of this object was the authority of the Sacred Scriptures. They obtain authority as the embodying of tradition; necessarily subjected, however, to the judgment and the exposition of the church, on which, indeed, all tradition, and even Scripture, is, according to him, dependent. By this authority of the Bible, the falsification of traditions has been, in a great measure, prevented. In the controversies concerning tradition, and concerning the accounts and the meaning of the Bible, the belief of the church always decided. The actual belief of the church universal, is necessarily the Catholic's last appeal; but what this is may be the subject of controversy. There is, in this case, no better remedy than to assemble the church, and let her express herself as is done in councils. The Catholic doubts not that the same Holy Spirit which is promised to the church, even till the end of time, will assist the church, when assembled, in rightly expressing her faith. The council creates no articles of faith. The whole church is unable to do this. The council merely expresses what the church believes, and declares that the church has preserved such a truth. The church, in the possession of a revelation handed down by tradition, must declare herself infallible. The established religious faith necessarily excludes a conviction of the possibility of the truth of the opposite opinion. If, therefore, the revelation, the tradition, is in itself infallible (as the Protestant holds the Bible to be infallible), should the church, which expresses this tradition, be less infallible? The church explains the Bible in accordance with tradition, of which it is a part and a copy. What the council expresses as a doctrine of faith is a canon. A canon is that which, according to the judgment of the church, is expressed in the Bible, and has always, and every where, and by all, been believed (*semper et ubique et ab omnibus creditum*.) Whenever the church finds one of these requisitions wanting, it establishes no canon. In this way the Bible and tradition are intimately blended. If it is asked, Why does the church consider those historical truths which have been handed down by tradition, and attested by the church assembled, as real truths? the answer of the Catholic is, Because her institution is of divine origin, and because a revelation has been delivered to her. Reason here objects, that the conclusion is obtained by arguing in a circle. The Catholic replies, that the objection is made because reason is desirous of having that proved which, resting on itself, is capable of no proof, and which, if it might have been proved and confirmed by evidence external to itself, would fall to pieces, because it would then be necessary to place reason above revelation. How can the church be censured for laying claim to infallibility, for rejecting the criticism of reason? If Christianity is a revelation, faith can be grounded only upon the testimony of the church (which, by means of tradition, hands down revelation, the sacred books, and regulations), and not upon the free investigation of reason, which protests against authority. That one council should, with respect to doctrine, contradict another, is an event which is, and must be, inconceivable to the Catholic. This is the fundamental view of Catholicism. There can, therefore, be only one infallible church.

II. *The Doctrines of Catholicism*.* The Catholic church is the community of saints, which has one faith, one charity, one hope. It believes in the doctrine of the Trinity, the redemption, &c. It believes in free will, immortality, and the moral law. The church is to restore the kingdom of God. The first man was created immediately by God, free from sin, adorned with innocence and holiness, and possessed of a claim to eternal life. This first man sinned, and thereby lost his innocence, holiness, and claim to eternal life. By his sin, all his posterity became sinners before God, and therefore, in like manner, lost eternal life. In this state of moral corruption, man was not to remain. Called to the kingdom of God, he must become holy and perfect, as God himself is holy and perfect. Revelation assists him in the attainment of this high destination; first, by informing him of what it is necessary for him to know (by enlightening mankind), and, secondly, by an extraordinary internal sanctification (by the consecration of mankind). But man actually attains to his high destination by faith in these doctrines and this sanctification, and by a course of life uninterruptedly continued and regulated accordingly. The Catholic believes in the immortality of the soul, and that it will hereafter be clothed with its body, which God will raise in perfection; further, that the condition of man in a future state will vary according as he has done good or evil. The wicked are for ever deprived of the sight of God. How those images in the sacred books, which represent this state to the senses, are to be understood, is not decided by the church. The good enjoy God for ever, and are blessed. The state of the good and the wicked commences immediately after death. A middle state is admitted for those souls which were not entirely estranged from the Eternal, which, therefore, in the other world, still have a *hope* of ultimately becoming united with the Creator. (See *Purgatory*.) The happy spirits, in the church triumphant, have not ceased to be connected with their brethren in the church militant. A band of love unites both worlds. (See *Saints*). Every one is rewarded according to those works which he has freely performed, although, at the same time, he has followed the influences of grace; but, as the Eternal foreknows the actions of men, so he foreknows, likewise, who will attain to happiness. (Controversy concerning predestination, decided by the council of Trent, session VI., canons 12, 15, 17.) A religious mind conceives the world to be entirely dependent upon God, and so revelation represents it. According to this, the world was created by God. Whether the Mosaic cosmogony is to be literally understood, the church has by no means decided. God preserves and governs the world. Hereafter, the world is to be destroyed. Man having been thus instructed by the church respecting divine things, men, and the world, it is necessary, in the second place, that he should be sanctified and consecrated by her. "The Christian standard demands not only an enlightened man, but one who is adorned with holiness; a man who is repelled from God by no polluting stain, but is drawn towards him by a pure nature. It requires a man who comes into connexion with God, not merely by a purely moral intercourse, in a spiritual way, but who, surrounded by the light of God himself, sees and enjoys him, and is exalted above sin, suffering, and death." The founder of our religion, therefore, in the first place, made a universal atonement for mankind; secondly, ordained means for their purification and sanctification, according to their various necessities. The Saviour, by his death, procured the pardon of sin for all men, justified them, and put it into their power to make themselves partakers of his elevation. Now the particular means for the purification and the sanctification of men are the seven sacraments. (q. v.) These sacraments are the essence of the Catholic mysteries. Without mysteries, man is cold and insensible. The Catholic mysteries, however, differ from the Protestant in this, that the former have a more universal and more settled character, while the latter are suffered to take their tone from the feelings of individuals. The centre of the Catholic mysteries is the sacrament of the Lord' supper, whereby believers join in real communion with the Lord. For all conditions and wants, she has made provision, and in her bosom has prepared a suitable asylum for every one. A man would greatly err, however, if he should believe that the church favoured mysteries, and attached herself to the arts, merely for the purpose of attracting adherents, and concealing internal defects. She needs it not. She offers words of life. Her system of belief is pure and consistent, and her morality is also pure. Indeed, the peculiar faith of the Catholic church has so often been disfigured by Protestants, that it is not strange that even the well-educated Protestant pities the honest Catholic, on account of the doctrines and ordinances falsely attributed to the Catholic church.

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* We continue to give the statement of the Catholic writer.

III. *The ecclesiastical Constitution of Catholicism, or the Catholic Church.* [It would be impossible even to mention all the objections which have been started against the organization of the Catholic church in the present work; but its historical importance makes it necessary to be known; and it is but fair to let the Catholics give their own statement on this subject. We therefore proceed with the Catholic article.] It was the design of Christ to establish a church, and certainly one which should endure. The object of the church is, through Christ, to reconcile fallen humanity with God. The church, which is to accomplish this object, is a spiritual and visible society. As a spiritual society, it stands in relation to Christ. As such, it is the union, the community, of all her living members with God the Father, through one Christ, in one Spirit of love. The apostle Paul represents these ideas particularly under two forms—under the form of a body, and that of a building. 1. He represents it under the form of a body. (*Eph.* iv; 1 *Cor.* xii, 4—30, xiii, 1—13, xiv, 1—40.) According to this, the church is a spiritual organization under one Head, Christ, in which no member is to remain isolated from the body, but each must necessarily make common cause with the rest, to accomplish the objects of the Spirit. 2. He represents it to us under the form of a house, a palace, a temple, a divine building. (*Eph.* ii, 19—22; 1 *Tim.* iii, 15.) Further, the church is not merely a spiritual, but a visible, society, since it exists upon earth as a society of visible combatants, engaged in warfare; and also, according to the figures of the apostle, is compared to a body, a temple, a palace, a house of God; and, finally, since Christ, though he operates invisibly by his Spirit, must also operate through visible organs, however named, whether apostles, teachers, or pastors. The visible church of Christ, contemplated as the visible body of Christ, is necessarily a union, a combination, a community, of all the members under one visible head, which has no other object than to effect and maintain a union with Christ, and, through Christ, with God the Father. This visible union of all the members in the visible church of Christ, can be effected only by the close connexion of individual churches with their immediate pastors, and of these with their superior pastors, who must also be connected with the centre of union, and thus maintain a connexion with Christ, the invisible Head, and, through Christ, with the Father. This intimate connexion with the centre of union necessarily presupposes that the visible head of all the church is in possession of the pre-eminence in authority and jurisdiction. This primacy, according to all the traditions of the apostles, rests in the person of the Roman bishop, as the successor of St Peter, whom Christ made the rock of his church, that is, the immoveable centre of his visible church. (*Matt.* xvi, 16.) The union of the church, by the connexion of individual churches with their pastors, and of these with their superior pastors, and of these last with the supreme pastor and head of the church, presupposes a hierarchy. This hierarchy is spiritual; spiritual in its origin, tendency, and mode of operation, though its actions must be visible. It is not, however, to be believed, because the Catholic church is a hierarchy, that she has any other head than Christ. He who is the Foundation of the world, is also the sure and proper foundation of the Catholic faith. The connexion which Christians have with the visible centre of union has for its highest object a connexion with Christ, the invisible Centre of union. To the Catholic, Christ is all in all. (*Col.* iii, 2.) For him there is salvation only in Christ. From Christ he derives all his gifts.—We shall now give a more particular explanation of the points of difference between this and other ecclesiastical systems. The church could not be one with the state. Religion was to be preached to all nations, and spread to the farthest boundaries of the world. States are subject to the vicissitudes of time. They may be, and indeed have been, hostile to religion. It was on this account that Christ said, "My kingdom is not of this world." The church, therefore, cannot recognise princes as bishops, as the Lutheran church does. She can, in general, allow them no influence in the management of church affairs; and where states have arrogated to themselves such influence, a reaction has soon followed, which has often passed as far to the opposite extreme. The regulation of the church could, also, not be made dependent on the religious communities. It is impossible for learners to define what instructions they ought to receive. Faith, in the church, does not originate with the low and pass to the high, but it originates with the high and passes to the low; not through the investigations of the communities, but through the instruction and the doctrines of salvation communicated by the apostles and bishops. The apostle Paul says, in the First Epistle to the Corinthians, that he was commissioned as an apostle by God, and by no means that he was ordained by Christian communities, which he, in fact, was just establishing. The apostles only, not Christian communities, were commanded to go into the world, and to teach all people. The former only, not the latter, were promised assistance. The Sacred Scriptures were by no means sufficient to preserve the true doctrine unchanged. There was need of the living Word, of the ministry, and of the assistance of the Spirit. "Know this first," says 2 Peter, i, 20, "that no prophecy of the Scripture is of any private interpretation." The apostles exercised the power of the church. They held their first council at Jerusalem. "It has pleased the Holy Spirit and us," said they, when they sent their decrees to Christian communities. This power, however, was no prerogative of the apostles individually, but a power which they possessed by virtue of their office, and which was to be extended to their successors, and that of necessity. This is proved, not only by the express assertion of Jesus, who says, in Matthew xvi, 18, that he will build his church upon a rock, and the gates of hell shall not prevail against it; and, in another place, promises to remain with them, even to the end of the world, by means of his Comforter (evidently referring to the power which preserves and governs the church); but it also naturally follows, from the plan of Christ, to establish a church universal, which would necessarily require the extension of this power to the successors of the apostles. The apostles, therefore, actually established bishops in every place; and, after their death, these bishops conducted the church, which continued to remain one and the same, until, in modern times, it entered into the heads of the reformers, to attack its constitution: hence the Catholic church has been preserved from the fate of Protestant churches, which, for want of such a constitution, have been lost in isolated communities. The bishops and successors of the apostles now form an association like that of the apostles. "There is one bishoprick," says Cyprian (*De Unitate Ecclesiæ*), "of which a part is held by each individual bishop, who is also a partaker of the whole in common with his brethren." (*Episcopatus unus est cujus a singulis in solidum pars tenetur*). Therefore as the rays of the sun are many but there is only one light; and as the branches of a tree are many, but make only one tree, fastened to the ground by a strong root; and as from one fountain many brooks may flow, and yet remain one at their source; so the church, which, by means of her prolific increase, extends herself in great numbers, far around, is also one. Every bishop is not merely a bishop of the world, but also of his own diocese. He is not an *œcumenical* or *universal bishop*, as John the Faster, of Constantinople, maintained of himself—a title which even Gregory declined. The diocese of the bishop originally consisted of the Christian community of a city. From this place the bishop spread Christianity, and organized new Christian communities, to which he gave pastors, as his delegates, to discharge a part of his official duties. These pastors, and the presbytery of the capital, formed the bishop's very influential council. They gave their opinions in the synod of the diocese; and the presbytery of the capital, afterwards called the *cathedral chapter*, was the representative of those pastors who did not assemble. The bishop only had *episcopal* power, properly so called. Pastors and presbyters were only an emanation from him. That bishops and priests, however, did not, as the Protestant systems of presbyterianism maintain, constitute only one order under different names, follows, not only from tradition, but with uncommon clearness, from the genuine epistles of St Ignatius, who lived about 107, and was a pupil of the apostles. In these, the bishop, as one ordained by God, is always distinguished from the assembly of priests. That, moreover, the order of priests was generally distinguished from the laity, by consecration, and by a divine mission, from the commencement of the church, follows from tradition, and also from the epistles of Paul to Timothy and Titus, and several other of his epistles. (Concerning the relation of the pope to bishops, and to the church in general, see *Pope*.) It will be sufficient to observe, here, that the church forms a kind of confederacy, in order to maintain her union, through the bishop at Rome, as successor to the chief of the apostles—through him whom Cyprian has called the *centrum unitatis* of the church; that the pope, by divine appointment, is the organ of the church; and that, at the assemblies of the church, he presides as first among equals (*primus inter pares*). Archbishops, patriarchs, &c., are not essential parts of the hierarchy, but have only become incidentally attached to it.

ROMAN CEMENTS. See *Cements*.

ROMAN KING. See *German Empire*.

ROMAN LAW. See *Civil Law*.

ROMAN LITERATURE. See *Rome*.

ROMANCE (so called from the *Romance* or *Romanic* language); a fictitious narrative in prose or verse, the interest of which turns upon marvellous and uncommon incidents. The name is derived from the circumstance of the romantic compositions of this kind having been written in the vulgar tongues, which were derived from the Roman, at a period when Latin was still the language of literature, law, &c. We have already given some general views of the origin and character of romantic fiction under the head of *Novels*. The modern European romance was at first metrical in its form, and founded on historical, or what was thought to be historical, tradition. The transition from the rhymed chronicles, which we find in the early periods of modern European history, to the metrical romance, was easy, and much of the material of the latter was derived, with suitable embellishments, from the former. The Anglo-Norman romance *le Brit* (1515), written by Wace, was founded on the chronicle of Geoffrey of Monmouth. The *Roman de Rose*, by the same author, is a fabulous history of the Norman dukes. In the end of the twelfth and beginning of the thirteenth centuries, great numbers of French metrical romances were written in England and Normandy, principally on the subject of Arthur and his knights of the round table, or on classical subjects, such as the Trojan war. The metrical romance was followed by the prose romance, which was founded on the same cycles of events and characters, but with great additions of adventures, machinery, &c. The prose romances were written chiefly during the thirteenth, fourteenth, and fifteenth centuries, and were at first mere versions of the metrical romances. They assumed the tone of history, and pretended to the character of presenting historical facts. They may be divided into romances of chivalry, spiritual or religious romances, comic, political, pastoral, and heroic romances. The romances of chivalry, considered in reference to the personages of whom they treat, form four classes:—1. Those relating to Arthur and the knights of the round table, and their exploits against the Saxons: among these are Merlin, Sangreal, Lancelot du Lac, Artus, &c. 2. Those connected with Charlemagne and his paladins, in which the enemy against whom the heroes contend are the Saracens: these are Guerin de Monglave, Huon de Bordeaux, &c.; the latter are founded on the fabulous chronicle of Turpin, from which are borrowed the expedition of Charlemagne into Spain, the battle of Roncesvalles, &c.; the former are derived, in a great measure, from the chronicle of Geoffrey of Monmouth. 3. The Spanish and Portuguese romances contain chiefly the adventures of two imaginary families of heroes, Amadis and Palmerin: their opponents are the Turks, and the scene is often in Constantinople. (See *Amadis*.) 4. The classical romances represent the mythological or historical heroes of antiquity in the guise of romantic fiction; thus we have the *Livre de Jason*, *Vie de Hercule*, *Alexandre*, &c., in which those heroes are completely metamorphosed into modern knights. The romances of chivalry are of Anglo-Norman origin, and, though naturalized in the Spanish peninsula, did not obtain that popularity and influence in Germany, Southern France (see *Provencal Poets*) and Italy, which they enjoyed in England, Northern France and the peninsula. Italy adopted, indeed, at a later period, the tales of Charlemagne and his peers, which form the subjects of the romantic epics of Boiardo (*Orlando Innamorato*), Pulci (*Morgante Maggiore*), and Ariosto (*Orlando Furioso*); and thus the fictitious narratives originally composed in metre, and then rewritten in prose, were decorated anew with the ours of verse. (See *Italian Literature*, division *Poetry*.) The spiritual romance differed from the chivalrous in recording the deaths of martyrs and the miracles of saints, but, in point of style and composition, was not essentially different from it. Among the works of this class are the Golden Legend, the *Contes Devots* of the French, and one of the most remarkable works of fiction, the Pilgrim's Progress. (See *Bunyan*.) The comic romance was the production of a later age, when the spirit of chivalry had become extinct, and new forms of society succeeded. Rabelais, Cervantes (whose Don Quixote was the death-blow of the romances of chivalry), Mendoza, author of *Lazarillo de Tormes*, the first romance in the style called *gusto picaresco*, Scarron (*Roman Comique*), were the principal writers of this kind of romantic composition. The political romance also forms a class by itself, to which the *Cyropedia* of Xenophon may be considered to belong; Barclay's *Argenis*, *Telemachus* (see *Fenelon*), and *Sethos*, are the principal works of this class. In the time of Cervantes, the pastoral romance, founded upon the Diana of Montemayor, was prevailing to such an extent as to attract his satire. In imitation of it, D'Urfé wrote his well known *Astrée*, which gave rise to the heroic romance of the seventeenth century. Gomberville, Calprenède and madame Scudéri composed these insipid and interminable folios, in which the heroines are all models of beauty and perfection, and the heroes live through their long-winded pages for love alone. See, on the subject of romance in general, Dunlop's *History of Romantic Fiction*; Ellis's *Specimens of Early English Fiction*; Panizzi's *Essay on the Romantic Narrative Poetry of the Italians*, prefixed to his edition of Boiardo and Arisosto (London, 1830); Sir Walter Scott's Introduction to *Sir Tristram*, and his articles *Chivalry* and *Romance*, printed in his miscellaneous works. See also the article *Romantic*, and the works there referred to.

ROMANIA, RUMELIA, or RUM-ILI. This name (signifying the *country of the Romans*) is applied by the Turks to the greater part of the Turkish empire in Europe, and by European writers to that part lying south of the Balkan, comprising the ancient Macedonia, Thrace and (previous to the Greek revolution) Greece. See *Turkey in Europe*.

ROMANIC LANGUAGES, or ROMANCE. In the countries belonging to the Western Roman empire, where Latin had been introduced, new dialects were formed at the time of the decline and fall of the empire, from the mixture of Latin with the languages of the barbarians, by whom the countries had been overrun. These were called *Romanic* idioms, or *Romance*. In all of them Latin was the basis and chief ingredient, and from them have sprung the languages now prevalent in the South of Europe—the Italian, French, Spanish, Portuguese, and the Rhætian, or Romanic in the narrower sense. Raynouard believes in an original Romanic language, which served as a common stock to the above dialects; but A. W. von Schlegel denies this, and has investigated the matter in his *Elémens de la Grammaire de la Langue Romane avant l'An* 1000 (Paris, 1816). A further corruption of the Italian gave rise to the *lingua Franca*. (q. v.)

ROMANO, GIULIO. See *Giulio Romano*.

ROMANTIC, in æsthetics, is used as contradistinguished to *antique*, or *classic*. (See these two articles.) Christianity turned men's thoughts from the external world, and the present condition of man, which had engrossed the attention of antiquity, to his spiritual nature and future destiny; and all the works of imagination soon testified of the change. An unbounded world of imaginary beings, good and bad, beautiful and deformed, human, animal, angelic and demoniac, was created. The effect was increased by the mixture of the northern element with that of the south; for the northern mythology was full of supernatural, shadowy beings. A further consequence of Christianity was the giving of increased importance to the individual. The love and hatred, success and sufferings, of individual men assumed a more prominent place than had been allowed them in antiquity; the sense of personal dignity was heightened, and the longing for something better than the present world can afford, became more intense. These circumstances furnished the chief elements of romantic poetry—the poetry of the middle ages. The Greek lived in what is and was, the Christian in what is to come. So much is the spirit of romantic poetry connected with Christianity, that Jean Paul says, in his *Vorschule zur Æsthetik*: "The origin and character of the whole modern poetry is so easily to be derived from Christianity, that the romantic might be called with equal propriety the *Christian* poetry." And so much is romantic poetry impressed with the longing for something beyond the existing world, that Viennet, in his *Epitre aux Muses sur les Romantiques* (Paris, 1824), says:—

C'est la mélancolie et la mysticité,
C'est l'affectation de la naïveté;
C'est un monde idéal qu'on voit dans les nuages:
Tout, jusqu'au sentiment, n'y parle qu'en images.
C'est un je ne sais quoi dont on est transporté;
Et moins on le comprend, plus on est enchanté.

"'Tis melancholy and mystery.
The affectation of sage quaintness.—
An ideal world seen in the clouds,
Where thought itself is clothed in imagery.—
It is an indescribable ecstasy.
The more unknown the more enchanting."

Romantic poetry first grew up in the south of Europe, as its name would naturally lead us to suppose (see *Romanic Languages*), and was imbued with the spirit of chivalry, which also had its origin there. Hence the reason why love holds so prominent a place in romantic poetry. The reader will find some remarks applicable to this subject in the article *Chivalry*, where we have attempted to trace the causes of this singular institution. The age of chivalry has passed; the chivalrous spirit has taken a different direction; but the causes which produced the romantic poetry are by no means all extinct; and the poetry of our time has much more resemblance to that of the middle ages than to the Greek. The same circumstances which gave its character to the poetry of the middle ages, had a corresponding influence on the fine arts in general, and music, painting and architecture were imbued with a peculiar spirit. The magnificent Gothic cathedrals which still remain, bear witness to the aspirations which Christianity awakened, and the solemnity which it inspired. The term *romantic*, therefore, is frequently applied to modern art in general, as contradistinguished to the antique *classic* or *plastic*.—See the article *Middle Ages*, also the excellent work of Bouterwek, *History of Arts, Sciences*, &c.; Jean Paul's *Vorschule*; an *Essay on the Romantic Narrative Poetry of the Italians*, in Panezzi's edition of Bojardo and Ariosto, vol. i. (London, 1830), and *Storia ed Analisi degli antichi Romanzi di Cavalleria e dei Poemi Romanzeschi d'Italia con Dissertazioni sull' Origine, sugl' Instituti, sulle Ceremonie de' Cavalieri, sulle Corti d'Amore*, &c., by Giulio Ferrario (Milan, 4 vols., 1828); the last of the four volumes is a *Bibliografia dei Romanzi*, &c. *d'Italia.* See, also, our articles on the *Portuguese*, *Spanish*, and *French Literatures*.

ROMANZOFF, Peter Alexandrowitsch, count, a Russian general and field-marshal, born about 1730, was descended from an illustrious family, and having entered into the army when very young, his courage and abilities soon procured him promotion. He commanded at the taking of Colberg in 1761; and in the following year the death of Peter III. prevented the invasion of Holstein, which he was about to undertake at the head of 40,000 men. Catharine II. made peace with the Danes, and, in 1769, employed Romanzoff against the Turks. He succeeded prince A. Galitzin, as commander-in-chief, in 1770, and obtained many advantages over the enemy in that and the following years, previously to the treaty into which he forced the grand vizier to enter, in his camp at Kainardgi, in July, 1774. He soon after set out for his government of the Ukraine. Romanzoff served against the Turks in the war which began in 1787. He died in December, 1796.

END OF VOLUME V.

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